USAARL Report No. 91-18

The Hazard of Exposure to Impulse Noise as a Function of Frequency

Voume II

By

James H. Patterson, Jr.
Melvin Carrier, Jr.
Kevin Bordwell
Ilia M. Lomba Gautier

Sensory Research Division

and

Roger P. Hamernik
William A. Ahroon
George Turrentine
C. E. Hargett, Jr.

Auditory Research Laboratory
State University of New York
at Plattsburgh

June 1991

Approved for public release; distribution unlimited.

United States Army Aeromedical Research Laboratory
Fort Rucker, Alabama 36362-5292

Notice

Qualified requesters

Qualified requesters may obtain copies from the Defense Technical Information Center (DTIC), Cameron Station, Alexandria, Virginia 22314. Orders will be expedited if placed through the librarian or other person designated to request documents from DTIC.

Change of address

Organizations receiving reports from the U.S. Army aeromedical Research Laboratory on automatic mailing lists should confirm correct address when corresponding about laboratory reports.

Disposition

Destroy this report when it is no longer needed. Do not return it to the originator.

Disclaimer

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other official documentation. Citation of trade names in this report does not constitute an official Department of the Army endorsement or approval of the use of such commercial items.

Animal use

In conducting the research described in this report, the investigators adhered to the Guide for care and use of laboratory animals, as promulgated by the Committee on Care and Use of Laboratory Animals of the Institute of Laboratory Resources Commission on Life Sciences, National Academy of Sciences-National Research Council.

Reviewed:

THOMAS L. FREZELL
LTC, MS
Director, Sensory Research Division

ROGER W. WILEY
Chairman, Scientific
Review Committee

Released for publication:

DAVID H. KARNEY
Colonel, MC, SFS
Commanding

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution unlimited
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) USAARL Report No. 91-18, Volume II	5. MONITORING ORGANIZATION REPORT NUMBER(S) U.S. Army Medical Research and Development Command
6a. NAME OF PERFORMING ORGANIZATION Sensory Research Division U.S. Army Aeromedical Rsch Lab 6b. OFFICE SYMBOL (If applicable) SGRD-UAS-AS	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) P.O. Box 577 Fort Rucker, AL 36362-5292	7b. ADDRESS (City, State, and ZIP Code) Fort Detrick Frederick, MD 21701-5012
8a. NAME OF FUNDING / SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
62777A	3E162777A878	157	
0601102A	3M161102BS15	282	

11. TITLE (Include Security Classification)
The hazard of exposure to impulse noise as a function of frequency

12. PERSONAL AUTHOR(S) James H. Patterson, Jr., Melvin Carrier, Jr., Kevin Bordwell, Ilia M. Lomba Gautier, Roger P. Hamernik, William A. Ahroon, George Turrentine, and C. E. Hargett, Jr.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM _____ TO _____	1991 June	359

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Impulse noise, hearing, chinchilla, audiometry, and histology
20	01		

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The energy spectrum of a noise is known to be an important variable in determining the effects of a traumatic exposure. However, existing criteria for exposure to impulse noise do not consider the frequency spectrum of an impulse as a variable in the evaluation of the hazards to the auditory system. This report presents the results of a study that was designed to determine the relative potential that impulsive energy concentrated at different frequencies has in causing auditory system trauma. One hundred and eighteen (118) chinchilla, divided into 20 groups with 5 to 7 animals per group, were used in these experiments. Pre- and post-exposure hearing thresholds were measured at 10 test frequencies between 0.125 and 8 kHz on each animal using avoidance conditioning procedures. Quantitative histology (cochleograms) was used to determine the extent and pattern of the sensory cell damage. The noise exposure stimuli consisted of six different computer-generated narrow band tone bursts having center frequencies located at 0.260, 0.775, 1.025, 1.350, 2.450, and 3.550 kHz. Each narrow band exposure stimulus was presented at two to four different intensities. An analysis of the audiometric and histological data allowed a frequency weighting function to be derived.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL Chief, Scientific Information Center	22b. TELEPHONE (Include Area Code) (205) 255-6907 22c. OFFICE SYMBOL SGRD-UAX-SI

DD Form 1473, JUN 86 Previous editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

19. (Cont'd)
The weighting function clearly demonstrates that equivalent amounts of impulsive energy concentrated at different frequencies is not equally hazardous to auditory function. Comparison of this weighting function with the A-weighting function showed that A-weighting overestimates the hazard from low frequency impulses. Volume 1 of the report describes the study and discusses the results. Volume 2 contains individual threshold shifts and sensory cell loss data. It is available upon request from the SIC USAARL.

Preface to Volume II

This report is separated into two volumes. Volume I describes the study, presents the analyzed results and discussion. This Volume, Volume II, contains threshold shifts and sensory cell loss data for individual subjects. Volume II is organized by exposure group:

Group exposed to 260 Hz center frequency at 146 dB peak SPL. 1

Group exposed to 775 Hz center frequency at 134 dB peak SPL 20

Group exposed to 775 Hz center frequency at 139 dB peak SPL 38

Group exposed to 775 Hz center frequency at 144 dB peak SPL 57

Group exposed to 1025 Hz center frequency at 129 dB peak SPL 76

Group exposed to 1025 Hz center frequency at 134 dB peak SPL 95

Group exposed to 1025 Hz center frequency at 139 dB peak SPL 114

Group exposed to 1025 Hz center frequency at 144 dB peak SPL 132

Group exposed to 1350 Hz center frequency at 129 dB peak SPL 151

Group exposed to 1350 Hz center frequency at 134 dB peak SPL 170

Group exposed to 1350 Hz center frequency at 139 dB peak SPL 189

Group exposed to 2450 Hz center frequency at 129 dB peak SPL 208

Group exposed to 2450 Hz center frequency at 134 dB peak SPL 227

Group exposed to 2450 Hz center frequency at 139 dB peak SPL 246

Group exposed to 2450 Hz center frequency
at 144 dB peak SPL 266

Group exposed to 3550 Hz center frequency
at 124 dB peak SPL 284

Group exposed to 3550 Hz center frequency
at 129 dB peak SPL 303

Group exposed to 3550 Hz center frequency
at 134 dB peak SPL 322

Group exposed to 3550 Hz center frequency
at 139 dB peak SPL 341

Summary data for the group exposed to:

260 Hz center frequency, 146 dB peak SPL

Animal #		
S35	-	Completed the entire protocol
S40	-	Completed the entire protocol
S42	-	Completed the entire protocol
S43	-	Completed the entire protocol
S50	-	Completed the entire protocol
T005	-	Completed the entire protocol

260 Hz center frequency, 146 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S35	23.0	8.0	0.0	0.0	3.0	-3.0	3.0	-3.0	0.0	5.0
S40	24.0	3.0	5.0	3.0	4.0	0.0	2.0	0.0	1.0	2.0
S42	26.0	5.0	7.0	5.0	2.0	2.0	2.0	2.0	3.0	2.0
S43	22.0	5.0	1.0	-3.0	-2.0	0.0	0.0	4.0	1.0	4.0
S50	23.0	8.0	0.0	0.0	1.0	-1.0	3.0	3.0	2.0	5.0
T005	21.0	4.0	0.0	2.0	-1.0	1.0	1.0	3.0	2.0	1.0
Mean	23.2	5.5	2.2	1.2	1.2	-0.2	1.8	1.5	1.5	3.2
S.D.	1.7	2.1	3.1	2.8	2.3	1.7	1.2	2.6	1.0	1.7

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S35	55.8	46.6	34.8	36.8	33.8	35.8	35.8	21.8	22.8	21.8
S40	24.6	5.6	7.6	3.6	4.6	2.6	0.6	0.6	3.6	2.6
S42	24.8	7.8	7.8	5.8	2.8	0.8	8.8	0.8	1.8	2.8
S43	38.0	32.4	12.8	10.8	5.8	1.8	11.4	8.6	10.8	9.8
S50	41.0	28.0	14.0	2.0	5.0	11.0	13.0	7.0	6.0	9.0
T005	21.0	4.0	2.0	-2.0	-1.0	5.0	1.0	5.0	4.0	11.0
Mean	34.2	20.7	13.2	9.5	8.5	9.5	11.8	7.3	8.2	9.5
S.D.	13.3	17.5	11.4	14.0	12.6	13.4	12.9	7.8	7.8	7.0

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S35	32.8	38.6	34.8	36.8	30.8	38.8	32.8	24.8	22.8	16.8
S40	0.6	2.6	2.6	0.6	0.6	2.6	-1.4	0.6	2.6	0.6
S42	-1.2	2.8	0.8	0.8	0.8	-1.2	6.8	-1.2	-1.2	0.8
S43	16.0	27.4	11.8	13.8	7.8	1.8	11.4	4.6	9.8	5.8
S50	18.0	20.0	14.0	2.0	4.0	12.0	10.0	4.0	4.0	4.0
T005	0.0	0.0	2.0	-4.0	0.0	4.0	0.0	2.0	2.0	10.0
Mean	11.0	15.2	11.0	8.3	7.3	9.7	9.9	5.8	6.7	6.3
S.D.	13.6	15.9	12.9	15.2	11.9	14.9	12.3	9.6	8.7	6.2

Temporary Threshold Shift (dB): 260 Hz center frequency, 146 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	20.0	29.0	38.0	27.0	44.0	53.0	32.0	31.0	30.0	39.0	28.0	37.0	34.0	33.0	32.0	53.0
S40	28.0	16.0	35.0	33.0	21.0	9.0	7.0	4.0	2.0	0.0	-2.0	-4.0	5.0	3.0	1.0	35.0
S42	11.0	-1.0	-3.0	-5.0	2.0	0.0	-2.0	-4.0	-6.0	3.0	1.0	-1.0	-3.0	-5.0	2.0	11.0
S43	30.0	19.0	28.0	26.0	23.0	22.0	21.0	30.0	24.0	18.0	16.0	17.0	13.0	23.0	11.0	30.0
S50	50.0	49.0	48.0	47.0	36.0	45.0	4.0	33.0	32.0	21.0	20.0	29.0	18.0	7.0	16.0	50.0
T005	32.0	21.0	30.0	9.0	8.0	-3.0	6.0	15.0	4.0	-7.0	2.0	1.0	0.0	-1.0	-2.0	32.0
Mean	28.5	22.2	29.3	22.8	22.3	21.0	11.3	18.2	14.3	12.3	10.8	13.2	11.2	10.0	10.0	35.2
S.D.	13.1	16.5	17.3	18.3	16.0	23.5	12.6	15.7	16.3	16.9	12.2	17.2	13.7	14.9	12.7	15.2

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	46.0	45.0	44.0	43.0	60.0	59.0	48.0	47.0	36.0	55.0	33.0	43.0	50.0	19.0	48.0	60.0
S40	50.0	48.0	57.0	35.0	23.0	11.0	9.0	6.0	4.0	2.0	0.0	-2.0	7.0	5.0	3.0	57.0
S42	23.0	1.0	-1.0	-3.0	-6.0	2.0	0.0	-2.0	-4.0	5.0	13.0	1.0	-1.0	-3.0	4.0	23.0
S43	38.0	37.0	36.0	34.0	21.0	10.0	19.0	38.0	32.0	26.0	44.0	25.0	31.0	8.0	29.0	44.0
S50	16.0	45.0	54.0	43.0	62.0	51.0	0.0	39.0	28.0	47.0	26.0	25.0	24.0	3.0	22.0	62.0
T005	40.0	39.0	28.0	17.0	16.0	65.0	4.0	3.0	2.0	1.0	10.0	-1.0	-2.0	-3.0	-4.0	65.0
Mean	35.5	35.8	36.3	28.2	29.3	33.0	13.3	21.8	16.3	22.7	21.0	15.2	18.2	4.8	17.0	51.8
S.D.	13.3	17.5	21.3	18.0	26.6	28.3	18.4	21.7	17.5	23.9	16.3	18.6	20.5	8.2	19.7	15.9

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	58.0	47.0	46.0	55.0	62.0	61.0	40.0	49.0	48.0	47.0	26.0	25.0	32.0	41.0	50.0	62.0
S40	32.0	40.0	19.0	37.0	25.0	3.0	1.0	8.0	-4.0	4.0	2.0	0.0	-1.0	7.0	5.0	40.0
S42	25.0	3.0	1.0	-1.0	-4.0	4.0	2.0	0.0	-2.0	-3.0	5.0	3.0	1.0	-1.0	-4.0	25.0
S43	36.0	25.0	24.0	22.0	19.0	8.0	7.0	16.0	20.0	4.0	22.0	3.0	9.0	8.0	17.0	36.0
S50	28.0	37.0	36.0	45.0	44.0	13.0	12.0	1.0	20.0	9.0	18.0	17.0	16.0	5.0	14.0	45.0
T005	48.0	47.0	56.0	15.0	4.0	23.0	2.0	1.0	0.0	-1.0	-2.0	7.0	-4.0	5.0	4.0	56.0
Mean	37.8	33.2	30.3	28.8	25.0	18.7	10.7	12.5	13.7	10.0	11.8	9.2	8.8	10.8	14.3	44.0
S.D.	12.7	16.9	19.8	20.7	24.7	22.0	15.0	18.9	20.0	18.6	11.6	9.8	13.5	15.1	19.0	13.5

Temporary Threshold Shift (dB): 260 Hz center frequency, 146 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	60.0	39.0	38.0	57.0	64.0	53.0	42.0	31.0	30.0	39.0	38.0	37.0	44.0	33.0	32.0	64.0
S40	36.0	34.0	23.0	21.0	19.0	7.0	5.0	2.0	0.0	-2.0	-4.0	4.0	3.0	1.0	-1.0	36.0
S42	19.0	7.0	-5.0	-7.0	0.0	-2.0	-4.0	-6.0	2.0	1.0	19.0	-3.0	-5.0	-7.0	0.0	19.0
S43	42.0	31.0	30.0	28.0	15.0	14.0	13.0	22.0	16.0	10.0	18.0	9.0	15.0	14.0	13.0	42.0
S50	40.0	19.0	28.0	17.0	36.0	25.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	7.0	6.0	40.0
T005	48.0	47.0	36.0	25.0	14.0	13.0	2.0	1.0	0.0	9.0	-2.0	-3.0	-4.0	-5.0	-6.0	48.0
Mean	40.8	29.5	25.0	23.5	24.7	18.3	10.3	8.8	8.3	9.7	11.5	7.2	8.5	7.2	7.3	41.5
S.D.	13.6	14.4	15.7	20.6	22.5	19.2	16.5	14.3	12.2	15.1	16.5	15.3	18.9	14.8	13.7	14.8

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	46.0	35.0	24.0	53.0	60.0	49.0	28.0	27.0	46.0	45.0	34.0	43.0	30.0	19.0	28.0	60.0
S40	34.0	32.0	21.0	9.0	7.0	-5.0	3.0	0.0	-2.0	6.0	4.0	2.0	1.0	-1.0	-3.0	34.0
S42	11.0	-1.0	-3.0	5.0	2.0	0.0	-2.0	6.0	4.0	-7.0	11.0	-1.0	-3.0	5.0	-8.0	11.0
S43	40.0	39.0	18.0	26.0	13.0	12.0	11.0	10.0	14.0	-2.0	6.0	7.0	3.0	22.0	1.0	40.0
S50	28.0	17.0	26.0	25.0	4.0	13.0	2.0	1.0	0.0	-1.0	-2.0	7.0	6.0	5.0	4.0	28.0
T005	60.0	59.0	38.0	27.0	26.0	15.0	4.0	3.0	-8.0	1.0	0.0	-1.0	-2.0	-3.0	6.0	60.0
Mean	36.5	30.2	20.7	24.2	18.7	14.0	7.7	7.8	9.0	7.0	8.8	9.5	5.8	7.8	4.7	38.8
S.D.	16.6	20.4	13.5	17.0	22.0	18.9	10.8	10.1	19.5	19.1	13.1	16.8	12.3	10.4	12.5	19.0

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	52.0	51.0	40.0	49.0	66.0	55.0	44.0	53.0	42.0	31.0	50.0	29.0	36.0	35.0	44.0	66.0
S40	18.0	26.0	15.0	13.0	11.0	-1.0	7.0	4.0	2.0	0.0	-2.0	6.0	5.0	3.0	1.0	26.0
S42	21.0	-1.0	-3.0	-5.0	-8.0	0.0	8.0	-4.0	-6.0	3.0	-9.0	-1.0	-3.0	5.0	2.0	21.0
S43	28.0	27.0	36.0	24.0	11.0	0.0	9.0	8.0	3.0	6.0	4.0	5.0	1.0	0.0	-1.0	36.0
S50	20.0	29.0	18.0	27.0	26.0	15.0	4.0	3.0	12.0	21.0	10.0	19.0	18.0	7.0	6.0	29.0
T005	48.0	47.0	26.0	15.0	14.0	33.0	22.0	11.0	0.0	-1.0	8.0	7.0	6.0	-5.0	4.0	48.0
Mean	31.2	29.8	22.0	20.5	20.0	17.0	15.7	12.5	8.8	10.0	10.2	10.8	10.5	7.5	9.3	37.7
S.D.	15.0	18.5	15.7	17.9	25.0	22.8	15.2	20.5	17.3	13.0	20.7	11.0	14.4	14.1	17.1	16.7

Temporary Threshold Shift (dB): 260 Hz center frequency, 146 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	36.0	25.0	44.0	43.0	70.0	59.0	48.0	37.0	36.0	25.0	34.0	23.0	50.0	19.0	38.0	70.0
S40	16.0	24.0	13.0	21.0	9.0	-3.0	-5.0	12.0	0.0	-2.0	-4.0	-6.0	3.0	1.0	-1.0	24.0
S42	11.0	-1.0	-3.0	-5.0	2.0	0.0	-2.0	-4.0	4.0	3.0	41.0	-1.0	-3.0	-5.0	2.0	41.0
S43	38.0	27.0	16.0	24.0	11.0	10.0	9.0	8.0	2.0	6.0	24.0	5.0	9.0	10.0	9.0	38.0
S50	26.0	35.0	14.0	13.0	12.0	11.0	0.0	9.0	8.0	7.0	6.0	5.0	14.0	13.0	12.0	35.0
T005	28.0	27.0	26.0	15.0	24.0	23.0	2.0	1.0	0.0	-1.0	8.0	-3.0	-4.0	5.0	-6.0	28.0
Mean	25.8	22.8	18.3	18.5	21.3	16.7	8.7	10.5	8.3	6.3	18.2	3.8	11.5	7.2	9.0	39.3
S.D.	10.7	12.3	15.6	15.7	24.9	22.7	19.8	14.2	13.9	9.8	17.6	10.4	20.1	8.6	15.6	16.3

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	52.0	51.0	30.0	39.0	56.0	65.0	44.0	23.0	42.0	41.0	30.0	19.0	26.0	25.0	24.0	65.0
S40	38.0	26.0	15.0	13.0	11.0	-1.0	7.0	14.0	2.0	10.0	-2.0	-4.0	5.0	3.0	1.0	38.0
S42	21.0	-1.0	-3.0	5.0	2.0	0.0	-2.0	-4.0	-6.0	3.0	1.0	-1.0	-3.0	-5.0	2.0	21.0
S43	14.0	13.0	32.0	20.0	17.0	6.0	15.0	14.0	8.0	2.0	20.0	1.0	1.0	6.0	-5.0	32.0
S50	16.0	15.0	14.0	13.0	12.0	1.0	-10.0	-1.0	-2.0	-3.0	6.0	5.0	4.0	3.0	2.0	16.0
T005	36.0	15.0	34.0	3.0	22.0	11.0	0.0	9.0	-2.0	-3.0	6.0	5.0	4.0	-7.0	2.0	36.0
Mean	29.5	19.8	20.3	15.5	20.0	13.7	9.0	9.2	7.0	8.3	10.2	4.2	6.2	4.2	4.3	34.7
S.D.	14.9	17.5	14.4	13.1	18.9	25.5	19.1	10.1	17.8	16.7	12.3	8.1	10.1	11.4	10.0	17.2

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	38.0	27.0	56.0	35.0	52.0	41.0	20.0	29.0	-2.0	37.0	36.0	15.0	32.0	11.0	20.0	56.0
S40	16.0	24.0	23.0	11.0	9.0	-3.0	5.0	12.0	0.0	8.0	6.0	4.0	3.0	1.0	-1.0	24.0
S42	9.0	-3.0	5.0	3.0	0.0	8.0	-4.0	4.0	2.0	1.0	-1.0	7.0	-5.0	-7.0	0.0	9.0
S43	46.0	35.0	34.0	42.0	9.0	8.0	7.0	6.0	10.0	14.0	22.0	3.0	9.0	8.0	7.0	46.0
S50	16.0	5.0	24.0	13.0	2.0	1.0	0.0	-1.0	8.0	-3.0	6.0	15.0	-6.0	3.0	2.0	24.0
T005	26.0	97.0	34.0	33.0	2.0	11.0	20.0	-1.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	2.0	97.0
Mean	25.2	30.8	29.3	22.8	12.3	11.0	8.0	8.2	2.7	9.0	10.8	8.2	6.2	3.2	5.0	42.7
S.D.	14.3	35.4	16.8	15.8	19.8	15.6	10.1	11.3	5.2	15.2	15.3	5.5	13.9	6.2	7.8	31.5

Temporary Threshold Shift (dB): 260 Hz center frequency, 146 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S35	38.0	17.0	36.0	15.0	52.0	41.0	0.0	19.0	18.0	27.0	16.0	5.0	22.0	1.0	40.0	52.0
S40	20.0	18.0	17.0	15.0	3.0	1.0	-1.0	6.0	4.0	2.0	0.0	-2.0	-3.0	5.0	3.0	20.0
S42	15.0	3.0	1.0	-1.0	-4.0	4.0	2.0	0.0	-2.0	-3.0	-5.0	13.0	1.0	-1.0	-4.0	15.0
S43	18.0	7.0	26.0	14.0	1.0	10.0	9.0	8.0	12.0	16.0	24.0	5.0	1.0	0.0	-1.0	26.0
S50	-2.0	7.0	6.0	25.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	7.0	6.0	5.0	4.0	25.0
T005	42.0	11.0	30.0	29.0	8.0	7.0	26.0	5.0	4.0	3.0	12.0	11.0	10.0	9.0	8.0	42.0
Mean	21.8	10.5	19.3	16.2	10.7	11.0	6.3	6.5	6.0	7.3	7.5	6.5	6.2	3.2	8.3	30.0
S.D.	16.1	6.0	13.8	10.4	20.6	15.0	10.3	6.8	7.6	11.7	11.6	5.3	9.0	3.8	16.1	14.1

260 Hz center frequency, 146 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
S35	123	1304	1160	669	3133
S40	22	319	167	260	746
S42	23	72	106	102	280
S43	7	75	93	80	248
S50	80	308	245	250	803
T005	5	51	48	41	140
Group mean	43				892
S.D.	48				1132
S.E.	19				462

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	3.8	79.0
	0.25 kHz	6.0	171.8
	0.5 kHz	25.5	263.2
	1 kHz	1.2	123.8
	2 kHz	1.3	148.7
	4 kHz	1.2	75.8
	8 kHz	2.0	10.0
	16 kHz	2.3	19.3
Standard deviations			
	0.125 kHz	2.1	63.6
	0.25 kHz	11.8	170.8
	0.5 kHz	36.6	264.4
	1 kHz	1.5	245.2
	2 kHz	1.6	324.5
	4 kHz	1.0	154.7
	8 kHz	1.3	6.1
	16 kHz	3.8	25.0

260 Hz center frequency, 146 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S35D							
0.125 kHz	5	63	46	42	151	1	14
0.25 kHz	30	240	121	121	482	88	83
0.5 kHz	86	261	257	130	648	176	112
1 kHz	0	278	288	58	624	0	0
2 kHz	0	291	298	222	811	3	0
4 kHz	0	158	146	87	391	1	2
8 kHz	1	4	3	8	15	0	0
16 kHz	1	9	1	1	11	0	0
TOTALS	123	1304	1160	669	3133	269	211
Chinchilla S40D							
0.125 kHz	5	54	41	68	163	0	0
0.25 kHz	2	91	57	80	228	0	22
0.5 kHz	6	141	54	78	273	0	4
1 kHz	3	15	2	11	28	3	1
2 kHz	2	5	4	8	17	0	2
4 kHz	0	8	5	2	15	0	0
8 kHz	4	5	4	8	17	1	0
16 kHz	0	0	0	5	5	0	0
TOTALS	22	319	167	260	746	4	29
Chinchilla S42D							
0.125 kHz	6	7	9	11	27	0	5
0.25 kHz	1	33	32	33	98	0	1
0.5 kHz	4	2	8	3	13	0	0
1 kHz	3	3	1	6	10	0	0
2 kHz	4	7	9	4	20	0	0
4 kHz	2	1	22	8	31	0	0
8 kHz	2	2	0	10	12	0	0
16 kHz	1	17	25	27	69	0	1
TOTALS	23	72	106	102	280	0	7

260 Hz center frequency, 146 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S43D							
0.125 kHz	3	5	3	15	23	0	2
0.25 kHz	0	5	2	7	14	0	0
0.5 kHz	1	39	48	41	128	5	21
1 kHz	0	10	25	5	40	0	3
2 kHz	0	12	7	5	24	0	0
4 kHz	1	2	5	1	8	0	0
8 kHz	1	2	3	5	10	0	0
16 kHz	1	0	0	1	1	0	0
TOTALS	7	75	93	80	248	5	26
Chinchilla S50D							
0.125 kHz	4	23	23	31	77	0	0
0.25 kHz	2	67	43	54	164	1	3
0.5 kHz	56	192	166	146	504	127	109
1 kHz	1	7	7	4	18	0	0
2 kHz	2	7	4	3	14	0	0
4 kHz	2	3	1	3	7	0	0
8 kHz	3	2	0	3	5	0	0
16 kHz	10	7	1	6	14	0	0
TOTALS	80	308	245	250	803	128	112
Chinchilla T005							
0.125 kHz	0	7	5	21	33	0	0
0.25 kHz	1	32	9	4	45	0	0
0.5 kHz	0	2	9	2	13	0	0
1 kHz	0	1	20	2	23	0	0
2 kHz	0	3	0	3	6	0	0
4 kHz	2	1	0	2	3	0	0
8 kHz	1	0	0	1	1	0	0
16 kHz	1	5	5	6	16	0	0
TOTALS	5	51	48	41	140	0	0

260 Hz center frequency, 146 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	3.8	26.5	21.2	31.3	79.0	0.2	3.5
0.25 kHz	6.0	78.0	44.0	49.8	171.8	14.8	18.2
0.5 kHz	25.5	106.2	90.3	66.7	263.2	51.3	41.0
1 kHz	1.2	52.3	57.2	14.3	123.8	0.5	0.7
2 kHz	1.3	54.2	53.7	40.8	148.7	0.5	0.3
4 kHz	1.2	28.8	29.8	17.2	75.8	0.2	0.3
8 kHz	2.0	2.5	1.7	5.8	10.0	0.2	0.0
16 kHz	2.3	6.3	5.3	7.7	19.3	0.0	0.2
TOTALS	43.3	354.8	303.2	233.7	891.7	67.7	64.2
Group standard deviations							
0.125 kHz	2.1	25.8	18.7	21.2	63.6	0.4	5.5
0.25 kHz	11.8	84.9	43.0	45.2	170.8	35.8	32.9
0.5 kHz	36.6	108.4	100.0	62.2	264.4	79.1	54.4
1 kHz	1.5	110.7	113.5	21.6	245.2	1.2	1.2
2 kHz	1.6	116.1	119.7	88.8	324.5	1.2	0.8
4 kHz	1.0	63.3	57.5	34.3	154.7	0.4	0.8
8 kHz	1.3	1.8	1.9	3.4	6.1	0.4	0.0
16 kHz	3.8	6.4	9.8	9.8	25.0	0.0	0.4
TOTALS	47.6	480.6	425.3	231.8	1131.9	110.7	82.4

260 Hz center frequency, 146 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S35D							
0.125 kHz	3.6	35.0	25.5	23.3	27.9	0.3	7.7
0.25 kHz	12.6	75.7	38.1	38.1	50.6	18.1	26.1
0.5 kHz	36.1	83.1	81.8	41.4	68.8	35.5	35.6
1 kHz	0.0	92.3	95.6	19.2	69.0	0.0	0.0
2 kHz	0.0	94.7	97.0	72.3	88.0	0.6	0.0
4 kHz	0.0	51.4	47.5	28.3	42.4	0.2	0.6
8 kHz	0.4	1.2	0.9	2.5	1.5	0.0	0.0
16 kHz	0.4	3.0	0.3	0.3	1.2	0.0	0.0
Chinchilla S40D							
0.125 kHz	3.6	30.0	22.7	37.7	30.1	0.0	0.0
0.25 kHz	0.8	28.7	18.0	25.3	24.0	0.0	6.9
0.5 kHz	2.5	44.7	17.1	24.7	28.8	0.0	1.2
1 kHz	1.2	5.0	0.6	3.6	3.1	0.6	0.3
2 kHz	0.8	1.6	1.3	2.6	1.8	0.0	0.6
4 kHz	0.0	2.6	1.6	0.6	1.6	0.0	0.0
8 kHz	1.6	1.6	1.3	2.6	1.8	0.2	0.0
16 kHz	0.0	0.0	0.0	1.6	0.5	0.0	0.0
Chinchilla S42D							
0.125 kHz	4.3	3.8	4.9	6.0	4.9	0.0	2.7
0.25 kHz	0.4	10.3	10.0	10.3	10.2	0.0	0.3
0.5 kHz	1.6	0.6	2.5	0.9	1.3	0.0	0.0
1 kHz	1.2	0.9	0.3	1.9	1.0	0.0	0.0
2 kHz	1.7	2.2	2.9	1.2	2.1	0.0	0.0
4 kHz	0.8	0.3	7.0	2.5	3.3	0.0	0.0
8 kHz	0.8	0.6	0.0	3.2	1.3	0.0	0.0
16 kHz	0.4	6.1	9.0	9.7	8.3	0.0	0.3

260 Hz center frequency, 146 dB peak SPL

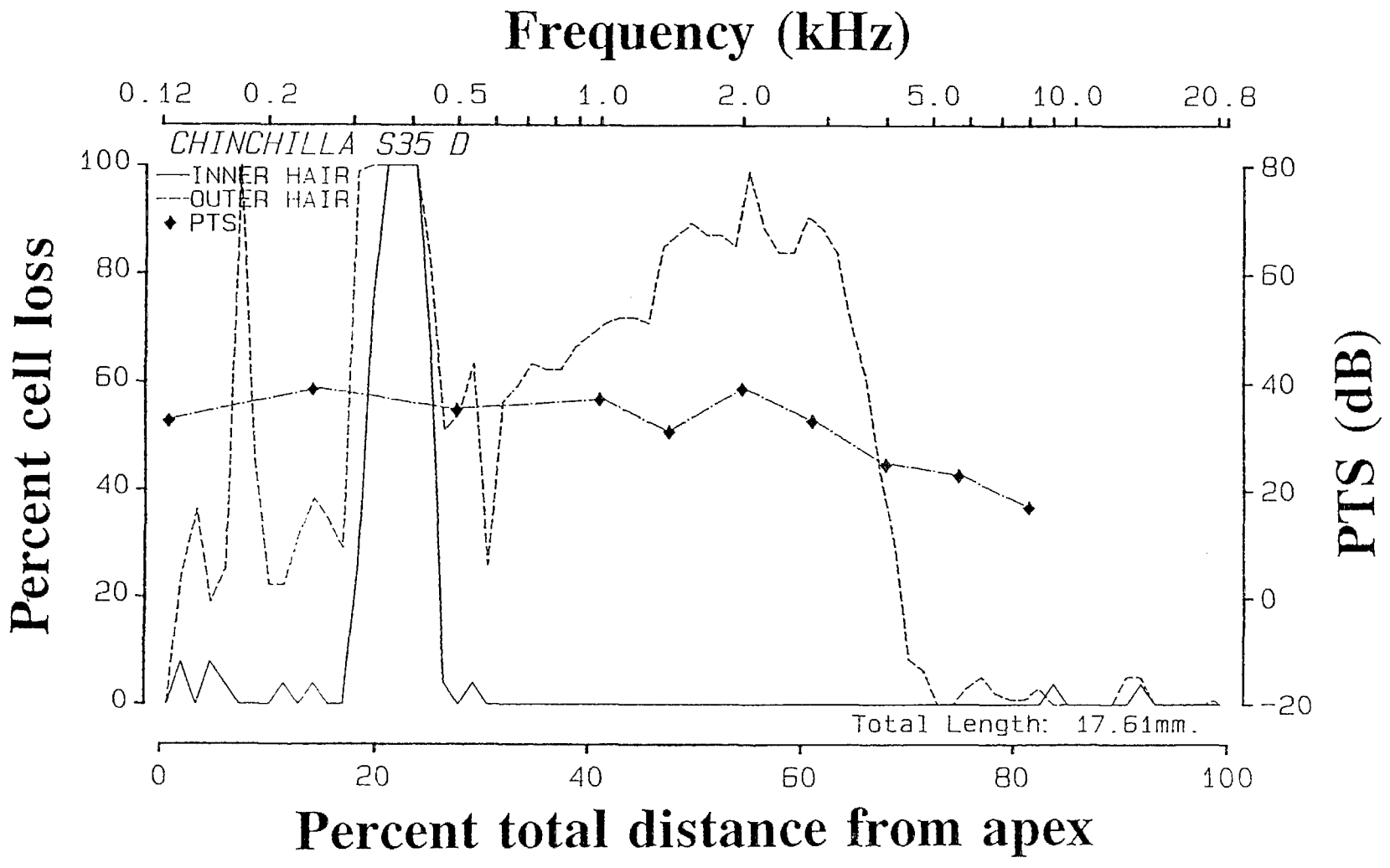
Percent sensory cell losses over octave band frequencies

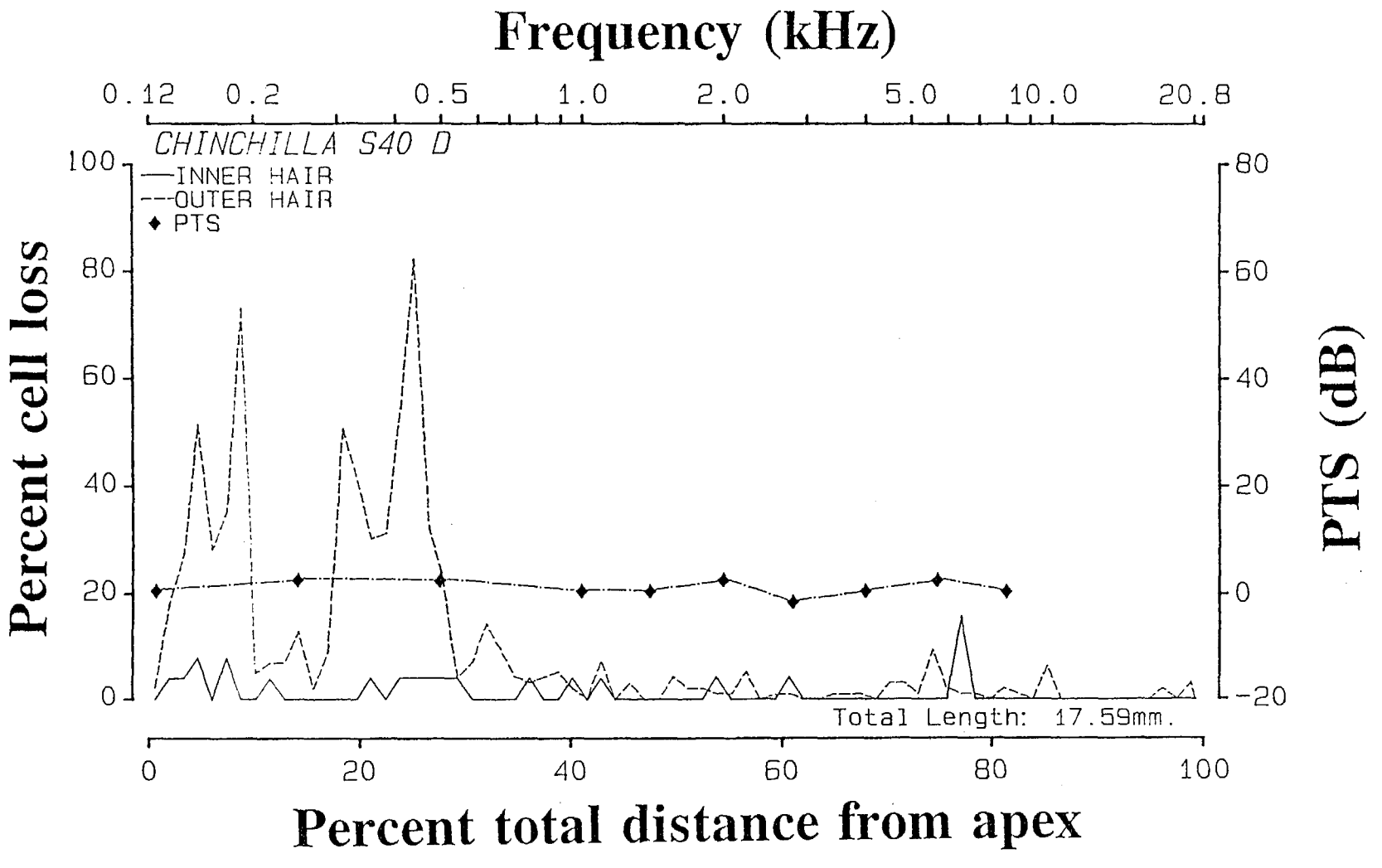
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S43D							
0.125 kHz	1.9	2.4	1.4	7.4	3.7	0.0	0.9
0.25 kHz	0.0	1.4	0.5	1.9	1.3	0.0	0.0
0.5 kHz	0.3	11.1	13.7	11.7	12.2	0.9	6.0
1 kHz	0.0	2.9	7.4	1.4	3.9	0.0	0.8
2 kHz	0.0	3.5	2.0	1.4	2.3	0.0	0.0
4 kHz	0.3	0.5	1.4	0.2	0.7	0.0	0.0
8 kHz	0.3	0.5	0.8	1.4	0.9	0.0	0.0
16 kHz	0.3	0.0	0.0	0.3	0.1	0.0	0.0
Chinchilla S50D							
0.125 kHz	2.8	12.5	12.5	16.9	14.0	0.0	0.0
0.25 kHz	0.8	20.9	13.4	16.8	17.0	0.2	0.9
0.5 kHz	23.3	60.3	52.2	45.9	52.8	25.2	34.2
1 kHz	0.4	2.2	2.2	1.3	1.9	0.0	0.0
2 kHz	0.8	2.2	1.2	0.9	1.4	0.0	0.0
4 kHz	0.8	0.9	0.3	0.9	0.7	0.0	0.0
8 kHz	1.1	0.6	0.0	0.9	0.5	0.0	0.0
16 kHz	4.1	2.3	0.3	1.9	1.5	0.0	0.0
Chinchilla T005							
0.125 kHz	0.0	3.6	2.5	10.8	5.6	0.0	0.0
0.25 kHz	0.3	9.3	2.6	1.1	4.3	0.0	0.0
0.5 kHz	0.0	0.5	2.6	0.5	1.2	0.0	0.0
1 kHz	0.0	0.3	6.1	0.6	2.3	0.0	0.0
2 kHz	0.0	0.9	0.0	0.9	0.6	0.0	0.0
4 kHz	0.7	0.3	0.0	0.6	0.3	0.0	0.0
8 kHz	0.3	0.0	0.0	0.3	0.1	0.0	0.0
16 kHz	0.4	1.6	1.6	2.0	1.7	0.0	0.0

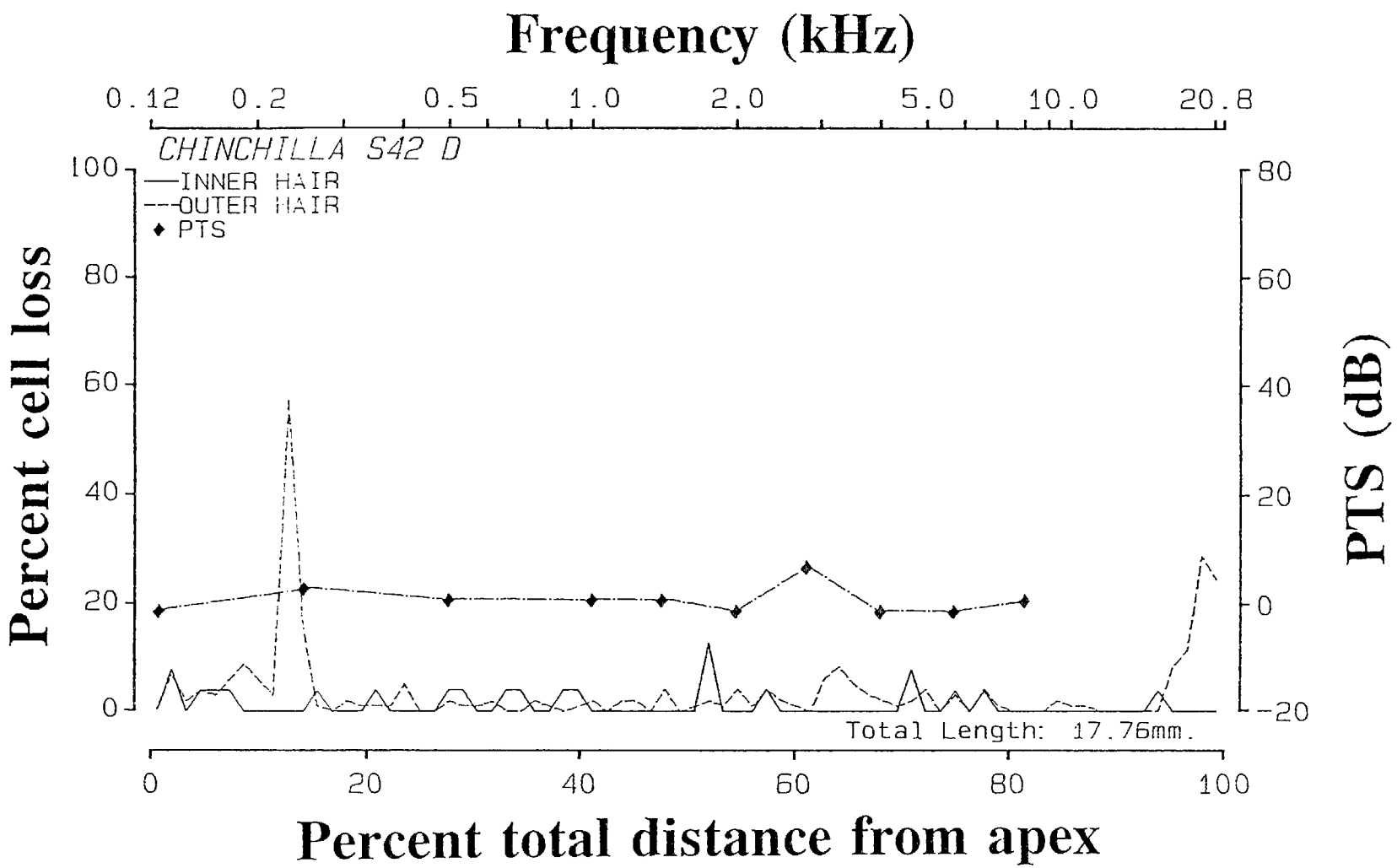
260 Hz center frequency, 146 dB peak SPL

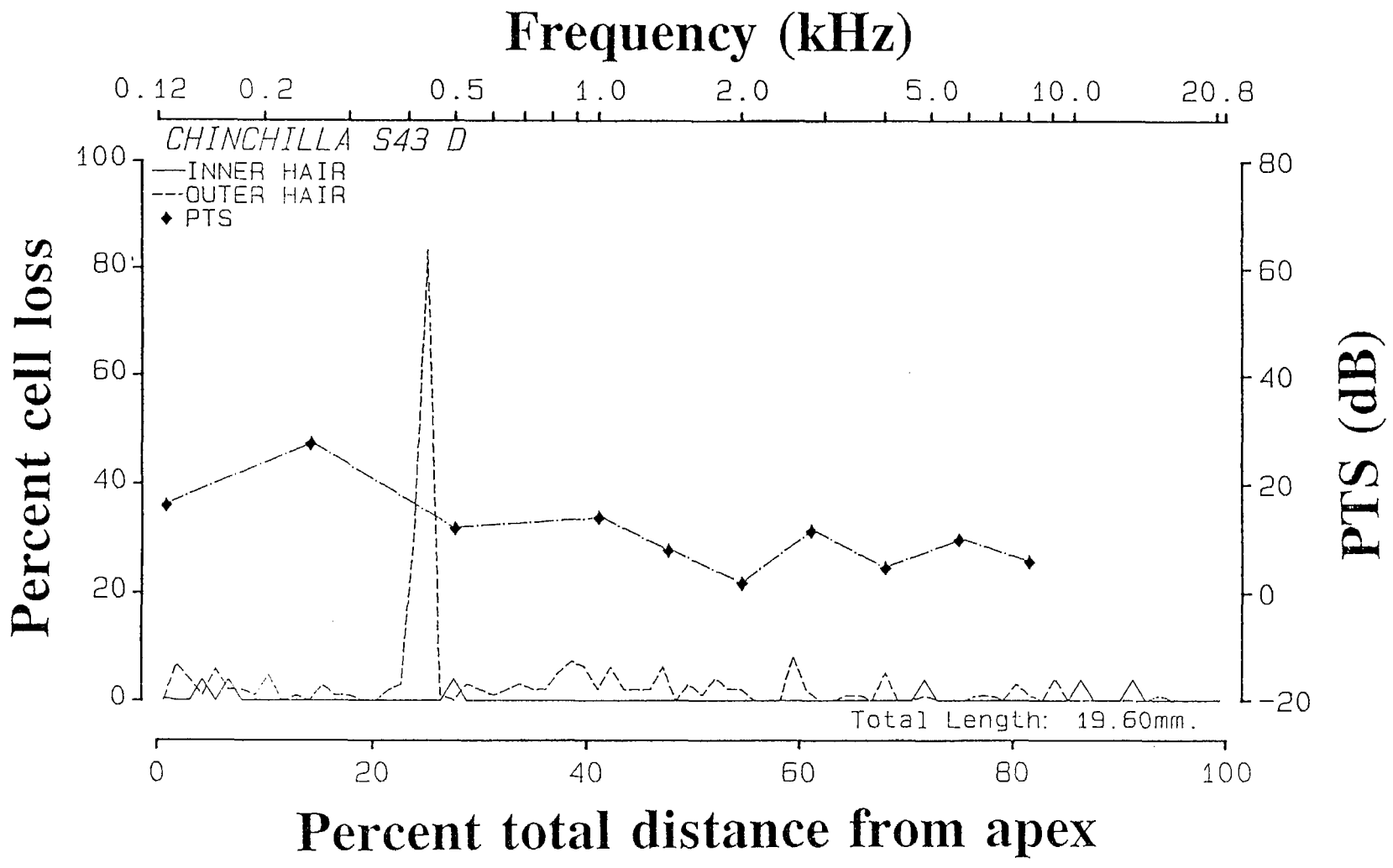
Percent sensory cell losses over octave band frequencies

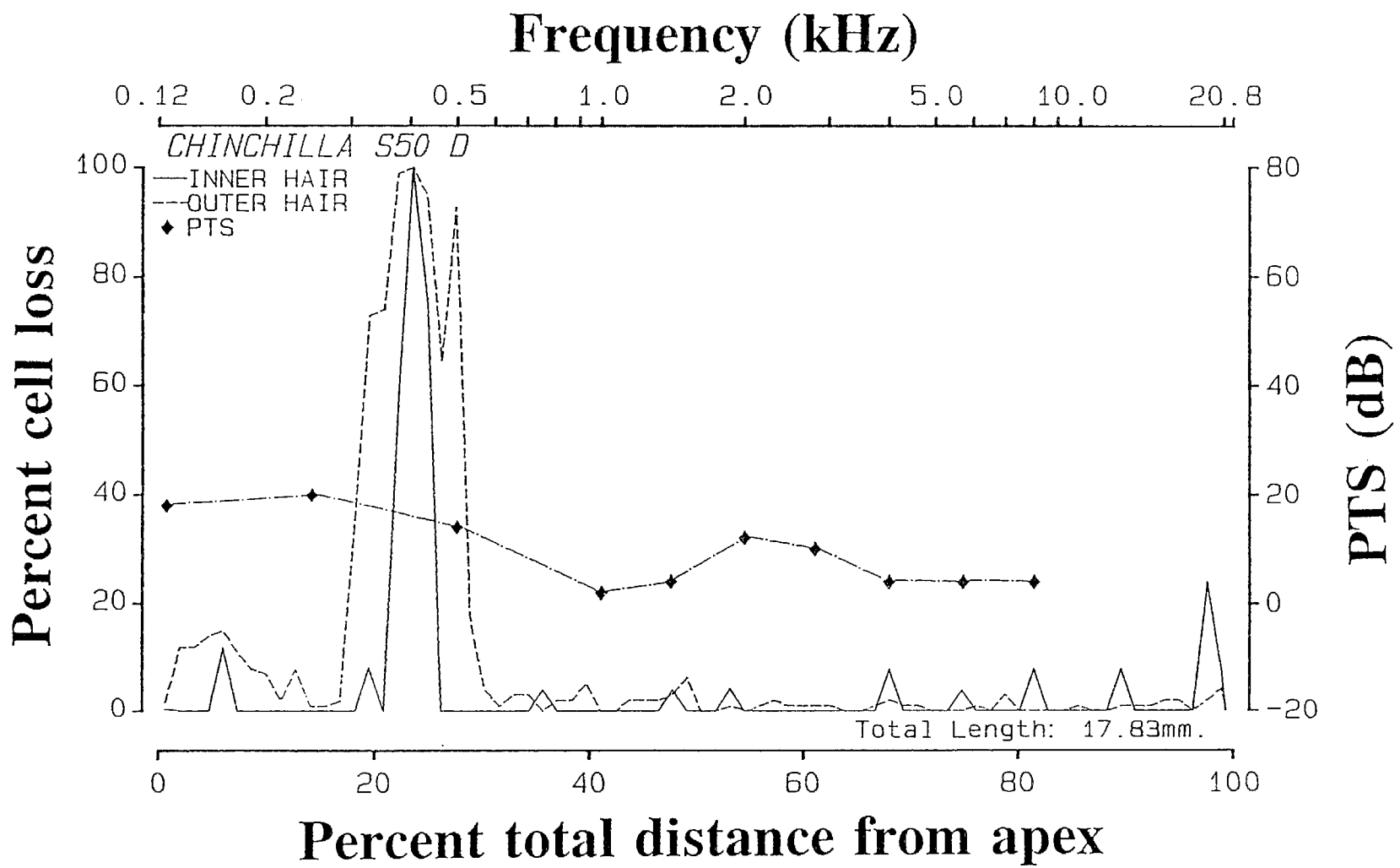
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	2.70	14.55	11.58	17.02	14.38	0.05	1.88
0.25 kHz	2.48	24.38	13.77	15.58	17.91	3.05	5.70
0.5 kHz	10.63	33.38	28.32	20.85	27.52	10.27	12.83
1 kHz	0.47	17.27	18.70	4.67	13.54	0.10	0.18
2 kHz	0.55	17.52	17.40	13.22	16.04	0.10	0.10
4 kHz	0.43	9.33	9.63	5.52	8.16	0.03	0.10
8 kHz	0.75	0.75	0.50	1.82	1.02	0.03	0.00
16 kHz	0.93	2.17	1.87	2.63	2.22	0.00	0.05
Group standard deviations							
0.125 kHz	1.56	14.45	10.48	12.00	11.93	0.12	3.04
0.25 kHz	4.97	26.90	13.60	14.34	18.05	7.37	10.34
0.5 kHz	15.34	34.57	31.93	19.80	28.13	15.90	17.24
1 kHz	0.59	36.80	37.78	7.19	27.20	0.24	0.33
2 kHz	0.69	37.82	39.01	28.95	35.26	0.24	0.24
4 kHz	0.38	20.63	18.72	11.19	16.81	0.08	0.24
8 kHz	0.52	0.56	0.57	1.12	0.65	0.08	0.00
16 kHz	1.56	2.28	3.54	3.54	3.02	0.00	0.12

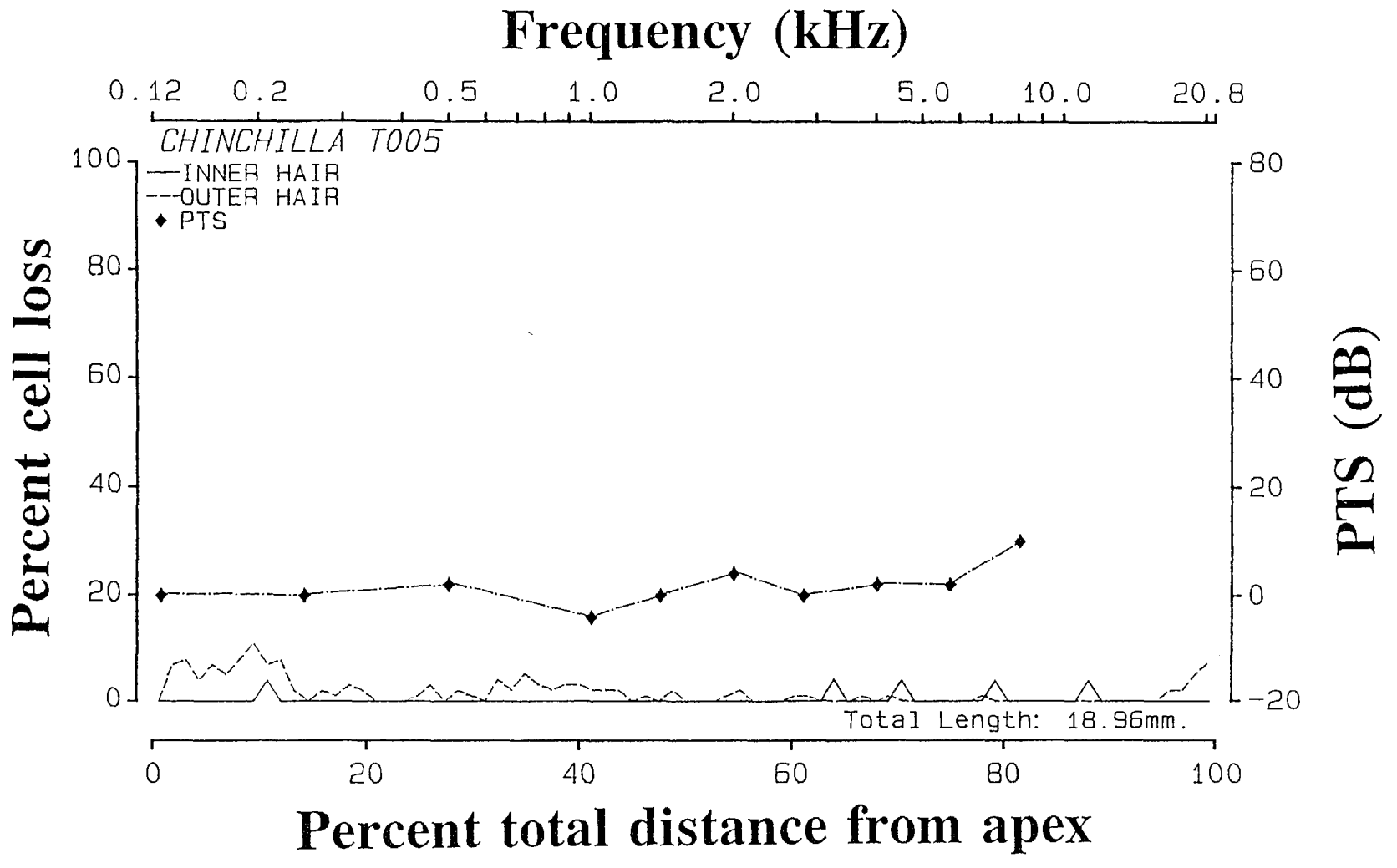

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S35 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.61mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S40 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.59mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S42 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.76mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S43 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.60mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S50 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.83mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T005
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.96mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

775 Hz center frequency, 134 dB peak SPL

Animal #		
T111	-	Completed the entire protocol
T132	-	Completed the entire protocol
T136	-	Completed the entire protocol
U02	-	Completed the entire protocol
U05	-	Completed the entire protocol

775 Hz center frequency, 134 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T111	25.0	8.0	0.0	2.0	1.0	1.0	1.0	1.0	2.0	7.0
T132	22.0	8.0	2.0	4.0	-3.0	-1.0	0.0	1.0	2.0	11.0
T136	21.0	8.0	4.0	2.0	5.0	1.0	3.0	1.0	2.0	9.0
U02	22.0	7.0	-3.0	3.0	-2.0	0.0	-2.0	-2.0	3.0	4.0
U05	26.0	1.0	3.0	5.0	4.0	4.0	0.0	2.0	3.0	0.0
Mean	23.2	6.4	1.2	3.2	1.0	1.0	0.4	0.6	2.4	6.2
S.D.	2.2	3.0	2.8	1.3	3.5	1.9	1.8	1.5	0.6	4.3

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T111	24.0	11.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	10.0
T132	22.6	9.6	1.6	1.6	2.6	0.6	0.6	6.6	5.6	6.6
T136	28.0	13.0	7.0	5.0	6.0	8.0	6.0	8.0	9.0	8.0
U02	19.0	10.0	2.0	6.0	11.0	5.0	11.0	9.0	12.0	7.0
U05	23.0	4.0	8.0	4.0	5.0	1.0	-1.0	-1.0	4.0	1.4
Mean	23.3	9.5	4.7	4.3	5.7	4.1	4.5	5.7	7.1	6.6
S.D.	3.2	3.3	2.9	1.7	3.2	3.2	4.8	3.9	3.3	3.2

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T111	-1.0	3.0	5.0	3.0	3.0	5.0	5.0	5.0	3.0	3.0
T132	0.6	1.6	-0.4	-2.4	5.6	1.6	0.6	5.6	3.6	-4.4
T136	7.0	5.0	3.0	3.0	1.0	7.0	3.0	7.0	7.0	-1.0
U02	-3.0	3.0	5.0	3.0	13.0	5.0	13.0	11.0	9.0	3.0
U05	-3.0	3.0	5.0	-1.0	1.0	-3.0	-1.0	-3.0	1.0	1.4
Mean	0.1	3.1	3.5	1.1	4.7	3.1	4.1	5.1	4.7	0.4
S.D.	4.1	1.2	2.4	2.6	5.0	3.9	5.5	5.1	3.2	3.1

Temporary Threshold Shift (dB): 775 Hz center frequency, 134 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	-3.0	-4.0	-5.0	4.0	3.0	12.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	4.0	3.0	12.0
T132	0.0	-1.0	6.0	-5.0	14.0	3.0	-8.0	-1.0	-6.0	-7.0	1.0	0.0	5.0	-6.0	3.0	14.0
T136	5.0	14.0	23.0	2.0	1.0	10.0	-1.0	8.0	7.0	6.0	5.0	4.0	3.0	12.0	11.0	23.0
U02	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	3.0	7.0
U05	9.0	-2.0	-3.0	-4.0	-5.0	-6.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	9.0
Mean	3.6	2.6	5.2	0.2	3.2	4.2	-0.8	1.8	0.0	-1.0	-0.2	-1.2	-1.0	0.0	3.0	13.0
S.D.	5.0	7.4	11.1	4.4	6.9	7.2	4.3	3.6	4.7	4.7	3.3	3.3	4.7	7.9	5.7	6.2

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	15.0	4.0	3.0	2.0	1.0	10.0	9.0	-2.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	15.0
T132	5.0	4.0	1.0	0.0	-1.0	8.0	-3.0	4.0	-1.0	-2.0	6.0	5.0	0.0	-1.0	-2.0	8.0
T136	19.0	8.0	-3.0	-4.0	5.0	4.0	3.0	2.0	1.0	10.0	9.0	-2.0	7.0	6.0	5.0	19.0
U02	13.0	12.0	21.0	20.0	19.0	8.0	7.0	6.0	5.0	14.0	3.0	2.0	1.0	0.0	9.0	21.0
U05	15.0	4.0	3.0	2.0	1.0	0.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	15.0
Mean	13.4	6.4	5.0	4.0	5.0	6.0	5.0	3.6	3.8	6.8	5.6	2.6	2.8	1.8	2.8	15.6
S.D.	5.2	3.6	9.3	9.3	8.1	4.0	5.1	3.8	3.6	5.9	2.2	2.8	2.7	2.7	4.3	5.0

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	37.0	26.0	15.0	14.0	3.0	12.0	11.0	0.0	-1.0	8.0	7.0	6.0	5.0	4.0	3.0	37.0
T132	-5.0	-6.0	11.0	0.0	-1.0	-2.0	-3.0	-6.0	-1.0	-2.0	-4.0	-5.0	10.0	-1.0	-2.0	11.0
T136	7.0	26.0	15.0	14.0	13.0	2.0	1.0	10.0	9.0	8.0	7.0	-4.0	5.0	4.0	3.0	26.0
U02	37.0	36.0	45.0	44.0	13.0	12.0	11.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	45.0
U05	7.0	6.0	5.0	4.0	3.0	2.0	1.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	10.0
Mean	16.6	17.6	18.2	15.2	6.2	5.2	4.2	4.8	5.0	6.0	4.8	1.8	6.0	3.0	2.0	25.8
S.D.	19.3	17.1	15.5	17.2	6.4	6.4	6.4	7.4	5.5	4.5	4.9	5.8	2.2	2.2	2.2	15.5

Temporary Threshold Shift (dB): 775 Hz center frequency, 134 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	27.0	26.0	15.0	14.0	3.0	22.0	21.0	10.0	9.0	8.0	7.0	6.0	-5.0	4.0	3.0	27.0
T132	5.0	4.0	11.0	10.0	-1.0	-2.0	7.0	4.0	-1.0	-2.0	-4.0	-5.0	0.0	-1.0	-2.0	11.0
T136	31.0	40.0	9.0	18.0	7.0	6.0	5.0	4.0	13.0	2.0	11.0	0.0	-1.0	-2.0	7.0	40.0
U02	33.0	32.0	31.0	30.0	19.0	18.0	7.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	9.0	33.0
U05	17.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	6.0	-5.0	4.0	-7.0	17.0
Mean	22.6	19.6	12.2	15.2	6.2	9.2	8.2	2.8	3.0	2.0	2.8	1.8	-2.0	1.0	2.0	25.6
S.D.	11.6	18.8	12.9	9.8	7.7	10.4	7.6	5.2	7.6	4.2	6.4	4.6	2.8	2.8	6.6	11.7

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	37.0	36.0	5.0	14.0	13.0	2.0	11.0	0.0	9.0	-2.0	-3.0	6.0	5.0	4.0	3.0	37.0
T132	11.0	0.0	7.0	16.0	5.0	4.0	13.0	10.0	5.0	4.0	2.0	11.0	6.0	5.0	4.0	16.0
T136	47.0	6.0	5.0	4.0	3.0	2.0	1.0	10.0	9.0	8.0	7.0	-4.0	-5.0	4.0	3.0	47.0
U02	37.0	16.0	45.0	14.0	33.0	22.0	21.0	10.0	9.0	8.0	17.0	16.0	15.0	14.0	3.0	45.0
U05	17.0	6.0	5.0	-6.0	-7.0	2.0	1.0	0.0	-1.0	8.0	7.0	-4.0	5.0	-6.0	3.0	17.0
Mean	29.8	12.8	13.4	8.4	9.4	6.4	9.4	6.0	6.2	5.2	6.0	5.0	5.2	4.2	3.2	32.4
S.D.	15.1	14.2	17.7	9.3	15.0	8.8	8.5	5.5	4.4	4.4	7.4	8.9	7.1	7.1	0.4	15.0

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	37.0	26.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	8.0	7.0	6.0	5.0	4.0	3.0	37.0
T132	9.0	8.0	15.0	4.0	13.0	2.0	1.0	-2.0	3.0	22.0	0.0	-1.0	4.0	3.0	2.0	22.0
T136	31.0	10.0	9.0	18.0	7.0	6.0	5.0	14.0	13.0	12.0	11.0	10.0	-1.0	8.0	7.0	31.0
U02	35.0	34.0	33.0	22.0	51.0	30.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	11.0	51.0
U05	7.0	-4.0	-5.0	-6.0	-7.0	-8.0	1.0	0.0	9.0	-2.0	-3.0	-4.0	-5.0	-6.0	3.0	9.0
Mean	23.8	14.8	11.4	8.4	13.4	6.4	3.4	4.0	6.2	9.2	4.0	3.0	1.2	2.2	5.2	30.0
S.D.	14.6	15.1	14.1	11.4	22.2	14.2	3.6	6.8	5.4	8.8	5.6	5.6	4.2	5.1	3.8	15.8

Temporary Threshold Shift (dB): 775 Hz center frequency, 134 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	7.0	16.0	15.0	14.0	3.0	2.0	1.0	0.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	16.0
T132	8.0	7.0	14.0	3.0	12.0	1.0	10.0	-3.0	2.0	11.0	-1.0	-2.0	3.0	2.0	1.0	14.0
T136	39.0	18.0	7.0	16.0	15.0	4.0	3.0	2.0	11.0	10.0	-1.0	8.0	-3.0	6.0	5.0	39.0
U02	37.0	46.0	45.0	24.0	43.0	22.0	11.0	10.0	9.0	8.0	7.0	16.0	15.0	14.0	13.0	46.0
U05	11.0	0.0	9.0	-2.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	11.0
Mean	20.4	17.4	18.0	11.0	16.0	7.0	6.0	2.6	6.8	7.8	2.6	5.6	3.8	4.8	3.8	25.2
S.D.	16.1	17.5	15.5	10.4	15.8	8.6	4.4	4.9	4.0	3.5	4.1	7.1	7.0	5.9	5.9	16.1

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	7.0	16.0	5.0	14.0	3.0	2.0	11.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	16.0
T132	7.0	6.0	13.0	2.0	21.0	0.0	-1.0	6.0	11.0	10.0	8.0	7.0	12.0	1.0	0.0	21.0
T136	31.0	40.0	9.0	28.0	17.0	16.0	5.0	4.0	3.0	2.0	1.0	10.0	9.0	8.0	7.0	40.0
U02	37.0	36.0	35.0	14.0	33.0	12.0	1.0	0.0	-1.0	8.0	7.0	16.0	15.0	14.0	3.0	37.0
U05	-1.0	-2.0	-13.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	5.0
Mean	16.2	19.2	9.8	10.8	15.8	6.8	3.8	4.4	4.6	5.6	4.4	7.4	7.6	4.6	1.6	23.8
S.D.	16.7	18.4	17.2	12.4	12.3	6.9	4.6	3.8	5.2	4.3	4.1	6.5	7.0	6.8	4.4	14.6

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	25.0	4.0	3.0	12.0	1.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	25.0
T132	5.0	14.0	21.0	10.0	9.0	18.0	17.0	4.0	9.0	8.0	6.0	-5.0	0.0	9.0	8.0	21.0
T136	39.0	-2.0	7.0	6.0	15.0	14.0	3.0	2.0	11.0	10.0	9.0	8.0	7.0	6.0	5.0	39.0
U02	31.0	30.0	19.0	18.0	37.0	6.0	15.0	-6.0	-7.0	2.0	11.0	10.0	9.0	8.0	7.0	37.0
U05	7.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	7.0	6.0	-5.0	-6.0	3.0	7.0
Mean	21.4	8.4	9.0	10.0	13.0	10.0	9.0	1.6	3.8	4.8	7.6	4.6	2.8	3.8	4.8	25.8
S.D.	14.9	14.0	10.9	5.5	14.5	6.3	7.1	5.2	7.6	4.8	2.4	5.8	5.6	6.1	2.9	13.0

Temporary Threshold Shift (dB): 775 Hz center frequency, 134 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T111	5.0	4.0	3.0	2.0	1.0	10.0	-1.0	-2.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	10.0
T132	1.0	-10.0	-3.0	-4.0	-5.0	4.0	-17.0	-10.0	-5.0	-6.0	-8.0	1.0	-4.0	-5.0	-6.0	4.0
T136	37.0	-4.0	-5.0	4.0	-7.0	2.0	1.0	0.0	9.0	8.0	-3.0	-4.0	-5.0	4.0	3.0	37.0
U02	25.0	24.0	23.0	12.0	31.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	31.0
U05	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	8.0	7.0	6.0	5.0	-4.0	3.0	2.0	1.0	8.0
Mean	14.6	3.6	4.2	3.2	4.2	5.2	-1.8	0.8	5.0	4.0	0.8	0.2	0.0	1.0	0.0	18.0
S.D.	15.6	12.8	11.1	5.8	15.4	4.6	9.4	7.6	5.7	5.7	6.0	4.0	4.1	3.5	3.5	14.9

775 Hz center frequency, 134 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
T111	14	63	67	77	207
T132	32	87	82	78	247
T136	0	55	61	56	172
U02	5	46	128	165	339
U05	7	37	121	136	294
Group mean	12				252
S.D.	12				67
S.E.	6				30

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.8	61.8
	0.25 kHz	0.2	32.8
	0.5 kHz	0.2	49.2
	1 kHz	0.2	15.0
	2 kHz	3.2	28.4
	4 kHz	5.6	40.0
	8 kHz	0.4	20.4
	16 kHz	0.0	4.2
Standard deviations			
	0.125 kHz	3.0	32.7
	0.25 kHz	0.4	26.5
	0.5 kHz	0.4	46.0
	1 kHz	0.4	10.0
	2 kHz	5.1	37.0
	4 kHz	9.3	59.5
	8 kHz	0.5	24.9
	16 kHz	0.0	2.5

775 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T111							
0.125 kHz	2	16	23	31	70	0	3
0.25 kHz	0	6	6	7	19	0	0
0.5 kHz	0	5	5	0	10	0	1
1 kHz	0	3	2	3	8	0	0
2 kHz	12	32	29	32	93	19	10
4 kHz	0	0	1	1	2	0	0
8 kHz	0	0	1	0	1	0	0
16 kHz	0	1	0	3	4	0	0
TOTALS	14	63	67	77	207	19	14
Chinchilla T132							
0.125 kHz	7	6	13	12	31	0	0
0.25 kHz	1	4	3	2	9	0	0
0.5 kHz	0	11	5	10	26	0	0
1 kHz	0	4	6	4	14	0	0
2 kHz	1	4	3	4	11	0	0
4 kHz	22	51	46	42	139	41	30
8 kHz	1	7	3	3	13	0	2
16 kHz	0	0	3	1	4	0	0
TOTALS	32	87	82	78	247	41	32
Chinchilla T136							
0.125 kHz	0	4	5	15	24	0	3
0.25 kHz	0	3	1	9	13	0	0
0.5 kHz	0	43	51	30	124	0	1
1 kHz	0	2	0	1	3	0	0
2 kHz	0	1	2	0	3	0	0
4 kHz	0	0	0	1	1	0	0
8 kHz	0	2	1	0	3	0	0
16 kHz	0	0	1	0	1	0	0
TOTALS	0	55	61	56	172	0	4

775 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla U02D							
0.125 kHz	0	3	24	62	89	0	0
0.25 kHz	0	6	4	49	59	0	1
0.5 kHz	1	5	9	10	24	0	0
1 kHz	1	9	12	2	23	1	0
2 kHz	0	9	13	3	25	0	0
4 kHz	3	9	33	11	53	0	0
8 kHz	0	4	33	25	62	0	0
16 kHz	0	1	0	3	4	0	0
TOTALS	5	46	128	165	339	1	1
Chinchilla U05D							
0.125 kHz	0	8	42	45	95	0	2
0.25 kHz	0	4	9	51	64	0	0
0.5 kHz	0	10	38	14	62	0	0
1 kHz	0	1	15	11	27	0	0
2 kHz	3	9	0	1	10	0	0
4 kHz	3	1	2	2	5	2	1
8 kHz	1	4	11	8	23	0	0
16 kHz	0	0	4	4	8	0	0
TOTALS	7	37	121	136	294	2	3
Group means							
0.125 kHz	1.8	7.4	21.4	33.0	61.8	0.0	1.6
0.25 kHz	0.2	4.6	4.6	23.6	32.8	0.0	0.2
0.5 kHz	0.2	14.8	21.6	12.8	49.2	0.0	0.4
1 kHz	0.2	3.8	7.0	4.2	15.0	0.2	0.0
2 kHz	3.2	11.0	9.4	8.0	28.4	3.8	2.0
4 kHz	5.6	12.2	16.4	11.4	40.0	8.6	6.2
8 kHz	0.4	3.4	9.8	7.2	20.4	0.0	0.4
16 kHz	0.0	0.4	1.6	2.2	4.2	0.0	0.0
TOTALS	11.6	57.6	91.8	102.4	251.8	12.6	10.8

775 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group standard deviations							
0.125 kHz	3.0	5.2	13.9	20.9	32.7	0.0	1.5
0.25 kHz	0.4	1.3	3.0	24.2	26.5	0.0	0.4
0.5 kHz	0.4	16.0	21.5	10.9	46.0	0.0	0.5
1 kHz	0.4	3.1	6.4	4.0	10.0	0.4	0.0
2 kHz	5.1	12.2	12.1	13.5	37.0	8.5	4.5
4 kHz	9.3	22.0	21.6	17.6	59.5	18.1	13.3
8 kHz	0.5	2.6	13.6	10.5	24.9	0.0	0.9
16 kHz	0.0	0.5	1.8	1.6	2.5	0.0	0.0
TOTALS	12.5	19.1	30.9	45.9	66.7	17.7	12.9

775 Hz center frequency, 134 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T111							
0.125 kHz	1.4	8.7	12.6	17.0	12.8	0.0	1.6
0.25 kHz	0.0	1.8	1.8	2.1	1.9	0.0	0.0
0.5 kHz	0.0	1.5	1.5	0.0	1.0	0.0	0.3
1 kHz	0.0	0.9	0.6	0.9	0.8	0.0	0.0
2 kHz	5.2	10.3	9.3	10.3	10.0	3.8	3.2
4 kHz	0.0	0.0	0.3	0.3	0.2	0.0	0.0
8 kHz	0.0	0.0	0.3	0.0	0.1	0.0	0.0
16 kHz	0.0	0.3	0.0	1.0	0.4	0.0	0.0
Chinchilla T132							
0.125 kHz	4.9	3.2	6.9	6.4	5.5	0.0	0.0
0.25 kHz	0.4	1.2	0.9	0.6	0.9	0.0	0.0
0.5 kHz	0.0	3.4	1.5	3.0	2.6	0.0	0.0
1 kHz	0.0	1.2	1.9	1.2	1.4	0.0	0.0
2 kHz	0.4	1.2	0.9	1.2	1.1	0.0	0.0
4 kHz	8.7	16.1	14.5	13.2	14.6	8.0	9.4
8 kHz	0.3	2.2	0.9	0.9	1.3	0.0	0.6
16 kHz	0.0	0.0	1.0	0.3	0.4	0.0	0.0
Chinchilla T136							
0.125 kHz	0.0	2.3	2.8	8.6	4.6	0.0	1.7
0.25 kHz	0.0	0.9	0.3	2.9	1.4	0.0	0.0
0.5 kHz	0.0	14.2	16.9	9.9	13.7	0.0	0.3
1 kHz	0.0	0.6	0.0	0.3	0.3	0.0	0.0
2 kHz	0.0	0.3	0.6	0.0	0.3	0.0	0.0
4 kHz	0.0	0.0	0.0	0.3	0.1	0.0	0.0
8 kHz	0.0	0.6	0.3	0.0	0.3	0.0	0.0
16 kHz	0.0	0.0	0.3	0.0	0.1	0.0	0.0

775 Hz center frequency, 134 dB peak SPL

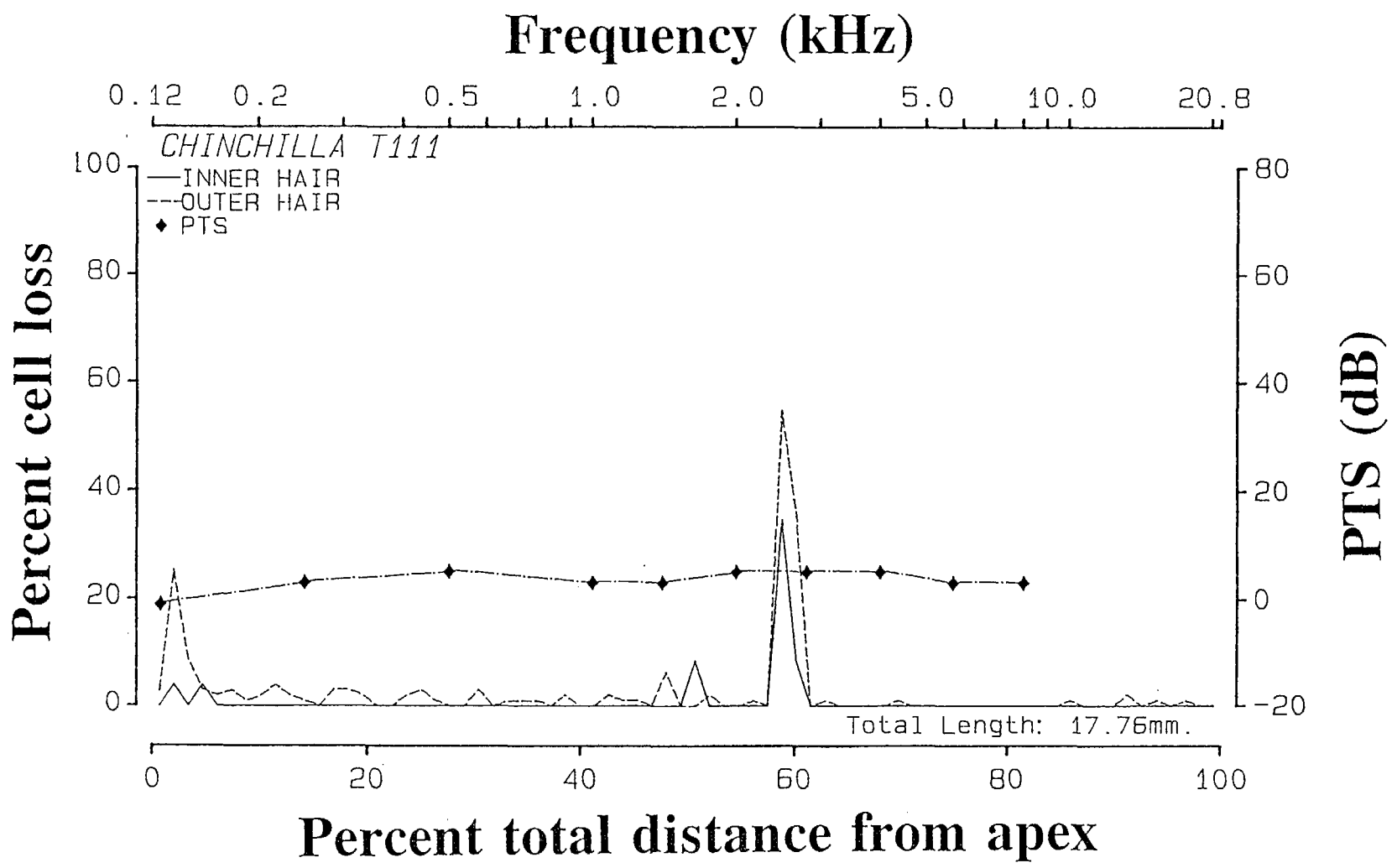
Percent sensory cell losses over octave band frequencies

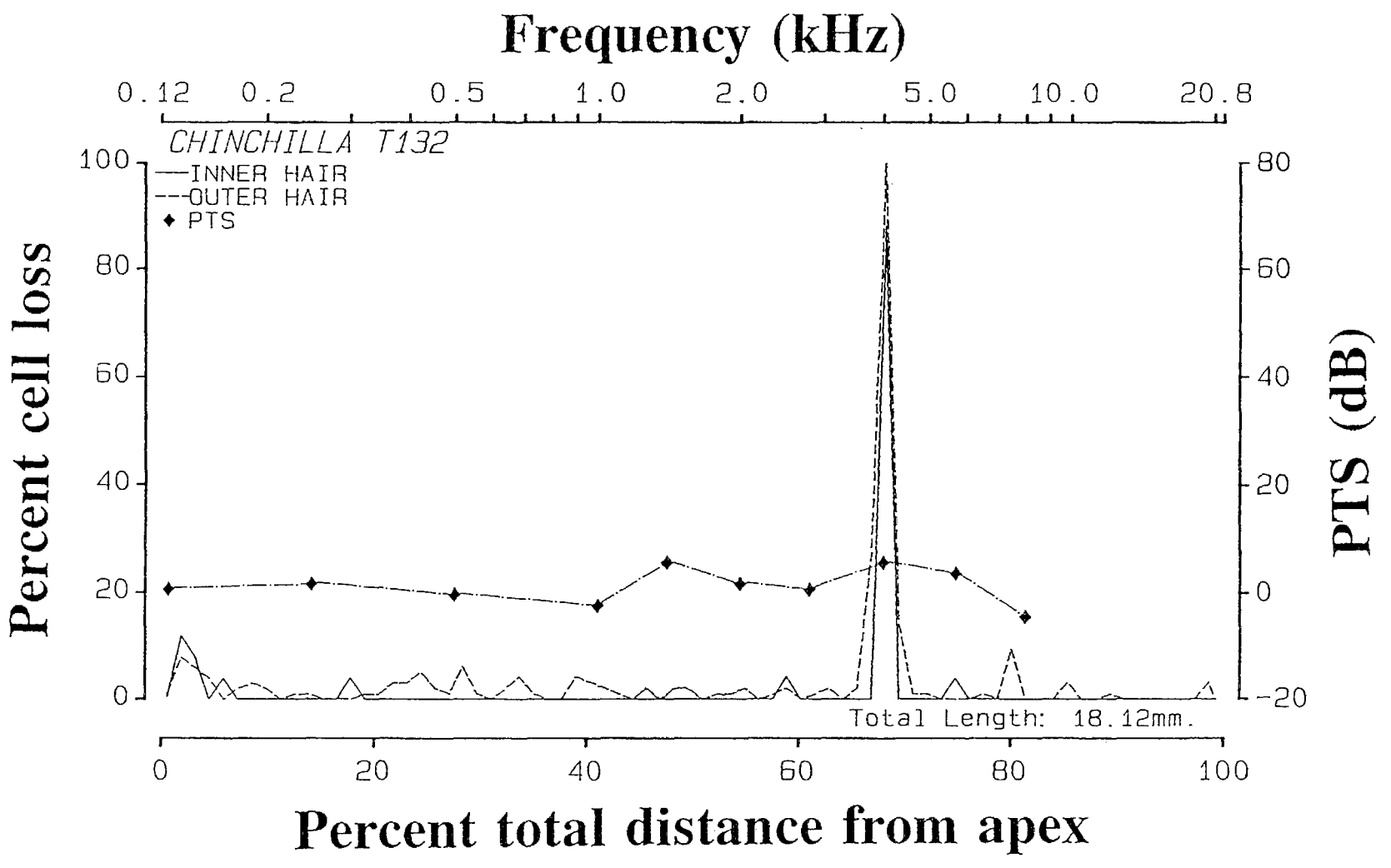
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla U02D							
0.125 kHz	0.0	1.6	13.5	35.0	16.7	0.0	0.0
0.25 kHz	0.0	1.9	1.2	15.8	6.3	0.0	0.3
0.5 kHz	0.4	1.6	2.9	3.2	2.6	0.0	0.0
1 kHz	0.4	3.0	4.0	0.6	2.5	0.2	0.0
2 kHz	0.0	2.9	4.3	0.9	2.7	0.0	0.0
4 kHz	1.2	2.9	10.9	3.6	5.8	0.0	0.0
8 kHz	0.0	1.3	10.9	8.3	6.8	0.0	0.0
16 kHz	0.0	0.3	0.0	1.1	0.5	0.0	0.0
Chinchilla U05D							
0.125 kHz	0.0	4.3	22.5	24.1	17.0	0.0	1.0
0.25 kHz	0.0	1.2	2.7	15.6	6.5	0.0	0.0
0.5 kHz	0.0	3.0	11.7	4.3	6.3	0.0	0.0
1 kHz	0.0	0.3	4.8	3.5	2.9	0.0	0.0
2 kHz	1.2	2.8	0.0	0.3	1.0	0.0	0.0
4 kHz	1.1	0.3	0.6	0.6	0.5	0.3	0.3
8 kHz	0.3	1.2	3.4	2.5	2.4	0.0	0.0
16 kHz	0.0	0.0	1.3	1.3	0.9	0.0	0.0
Group means							
0.125 kHz	1.26	4.02	11.66	18.22	11.30	0.00	0.86
0.25 kHz	0.08	1.40	1.38	7.40	3.39	0.00	0.06
0.5 kHz	0.08	4.74	6.90	4.08	5.24	0.00	0.12
1 kHz	0.08	1.20	2.26	1.30	1.59	0.04	0.00
2 kHz	1.36	3.50	3.02	2.54	3.02	0.76	0.64
4 kHz	2.20	3.86	5.26	3.60	4.24	1.66	1.94
8 kHz	0.12	1.06	3.16	2.34	2.19	0.00	0.12
16 kHz	0.00	0.12	0.52	0.74	0.46	0.00	0.00

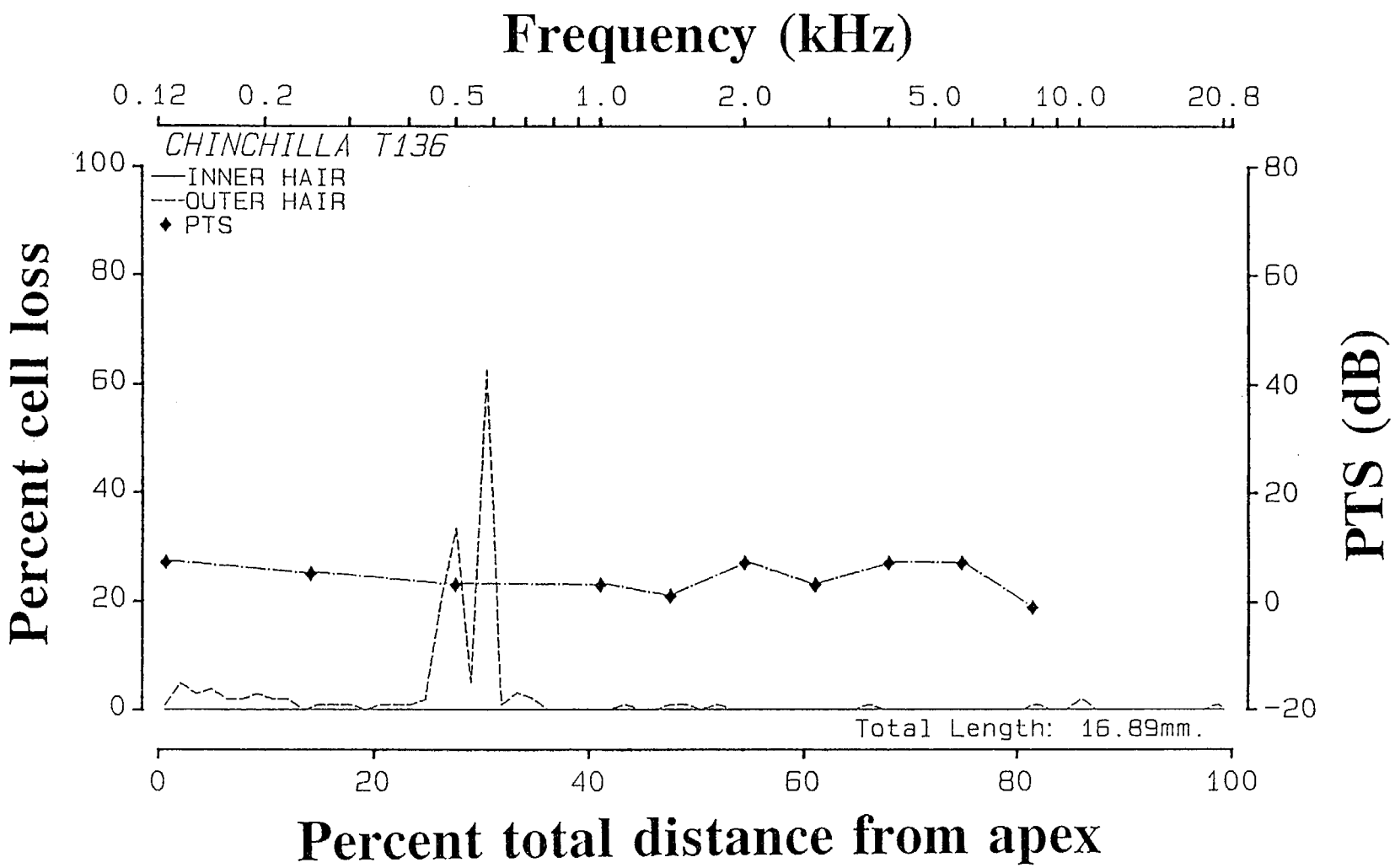
775 Hz center frequency, 134 dB peak SPL

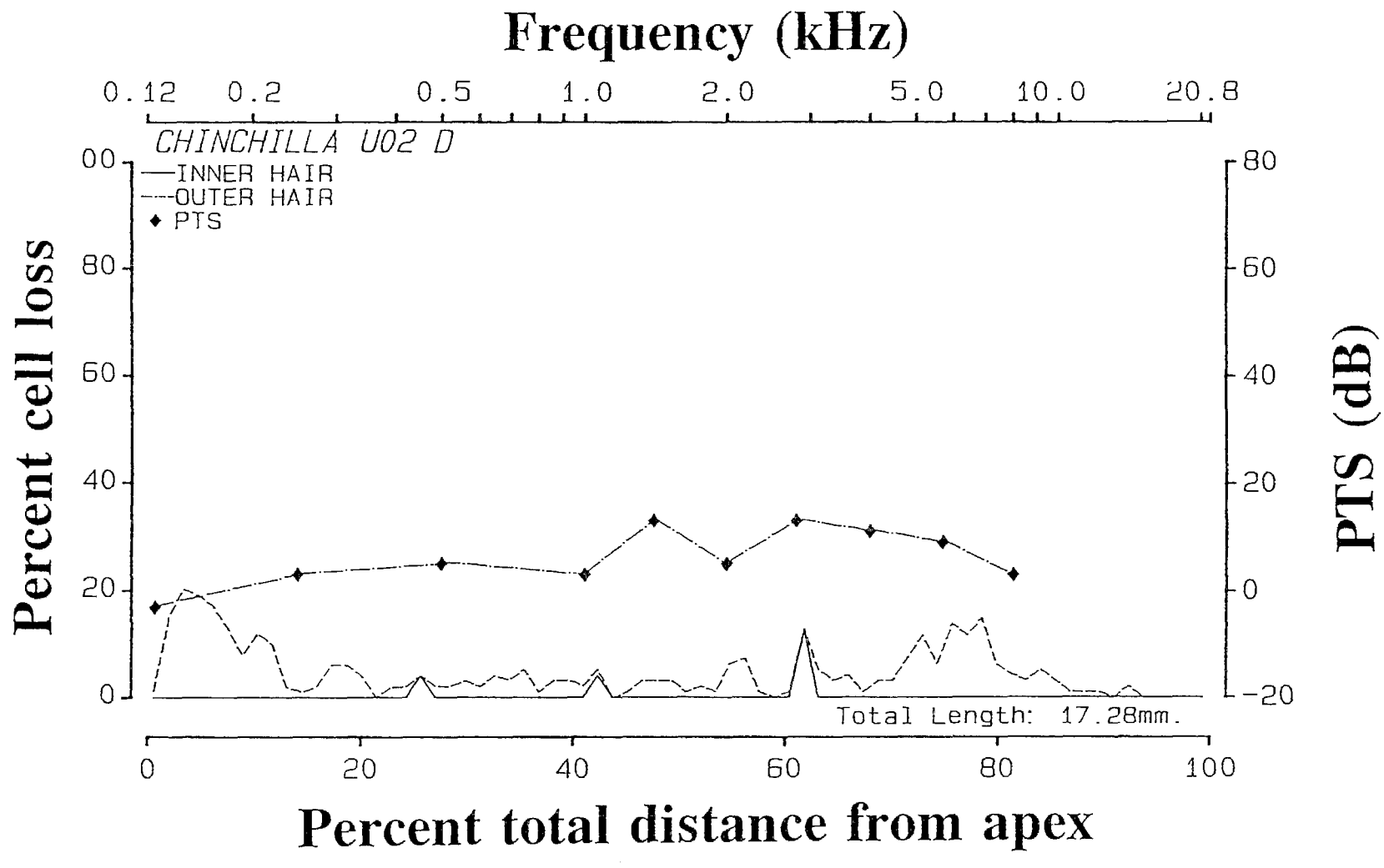
Percent sensory cell losses over octave band frequencies

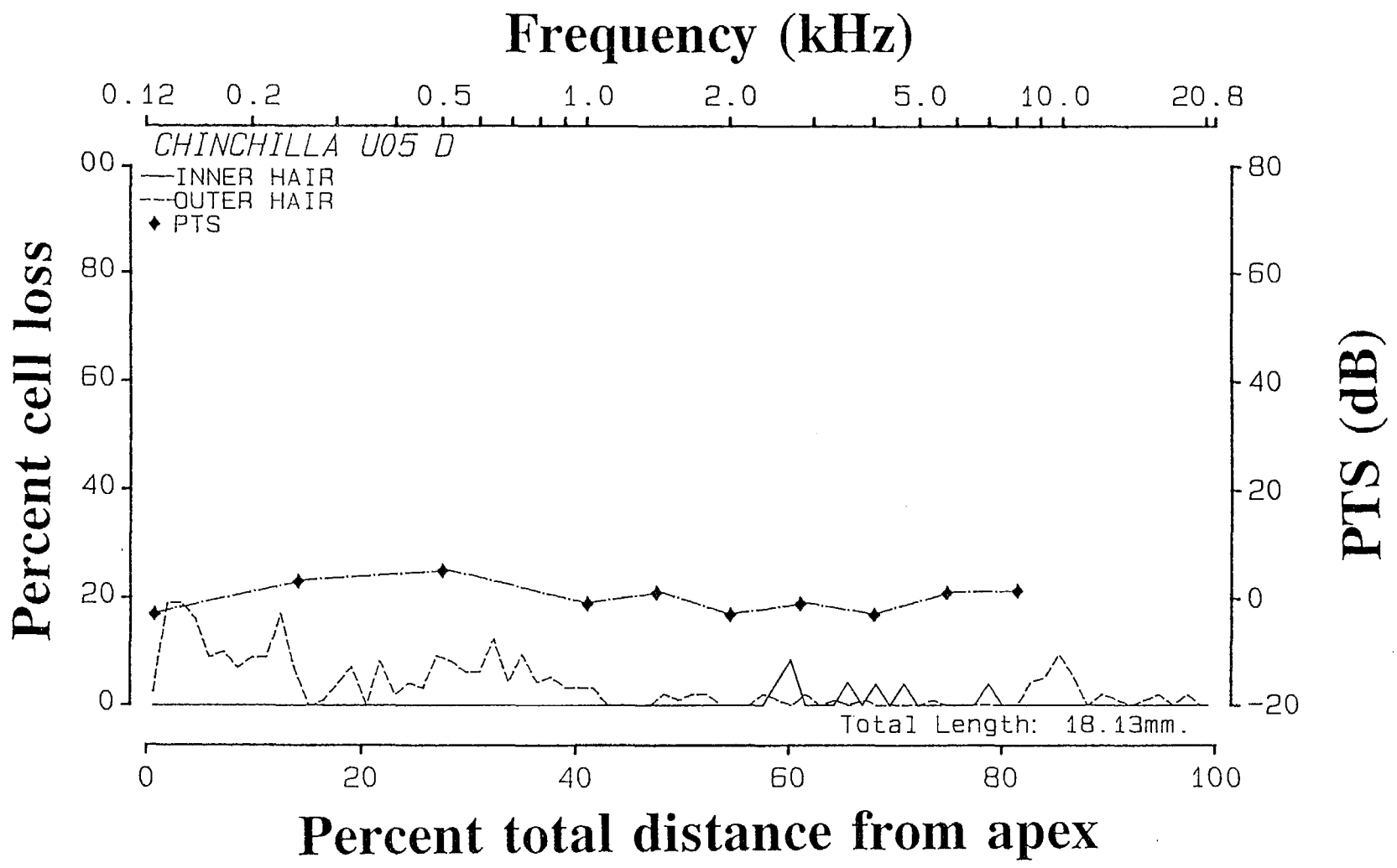
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group standard deviations							
0.125 kHz	2.12	2.80	7.47	11.72	5.97	0.00	0.83
0.25 kHz	0.18	0.43	0.91	7.62	2.77	0.00	0.13
0.5 kHz	0.18	5.35	7.02	3.62	5.10	0.00	0.16
1 kHz	0.18	1.06	2.09	1.27	1.10	0.09	0.00
2 kHz	2.20	3.96	3.89	4.36	3.98	1.70	1.43
4 kHz	3.68	6.95	6.91	5.54	6.27	3.55	4.17
8 kHz	0.16	0.82	4.51	3.48	2.75	0.00	0.27
16 kHz	0.00	0.16	0.60	0.56	0.27	0.00	0.00


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T111
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.76mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T132
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.12mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T136
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.89mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA U02 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.28mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA U05 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.13mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

775 Hz center frequency, 139 dB peak SPL

Animal #		
L051	-	Completed the entire protocol
L053	-	Completed the entire protocol
L084	-	Completed the entire protocol
L089	-	Completed the entire protocol
L096R	-	Completed the entire protocol
L142R	-	Completed the entire protocol

775 Hz center frequency, 139 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L051	24.0	10.0	6.0	2.0	6.0	4.0	3.0	2.0	3.0	4.0
L053	23.0	11.0	3.0	1.0	1.0	5.0	2.0	1.0	4.0	7.0
L084	28.0	10.0	0.0	-2.0	0.0	2.0	3.0	4.0	2.0	6.0
L089	25.0	11.0	3.0	1.0	1.0	1.0	2.0	1.0	2.0	5.0
L096R	25.0	11.0	1.0	1.0	-1.0	3.0	0.0	3.0	4.0	9.0
L142R	25.0	11.0	5.0	1.0	3.0	3.0	4.0	3.0	4.0	4.0
Mean	25.0	10.7	3.0	0.7	1.7	3.0	2.3	2.3	3.2	5.8
S.D.	1.7	0.5	2.3	1.4	2.5	1.4	1.4	1.2	1.0	1.9

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L051	22.0	12.0	6.0	6.0	6.0	4.0	3.0	6.0	9.0	10.0
L053	23.0	9.0	5.0	1.0	3.0	3.0	2.0	5.0	4.0	7.0
L084	34.8	24.8	12.8	16.8	14.8	22.8	12.2	12.8	19.8	18.8
L089	27.2	11.2	1.2	3.2	-2.8	3.2	-1.8	1.2	6.2	7.2
L096R	38.4	22.4	20.4	16.4	18.4	16.4	17.4	16.4	17.4	20.4
L142R	25.2	15.2	3.2	3.2	7.2	11.2	8.2	11.2	6.4	15.2
Mean	28.4	15.8	8.1	7.8	7.8	10.1	6.8	8.8	10.5	13.1
S.D.	6.7	6.4	7.2	7.0	7.8	8.2	7.1	5.7	6.5	5.9

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L051	-2.0	2.0	0.0	4.0	0.0	0.0	0.0	4.0	6.0	6.0
L053	0.0	-2.0	2.0	0.0	2.0	-2.0	0.0	4.0	0.0	0.0
L084	6.8	14.8	12.8	18.8	14.8	20.8	9.2	8.8	17.8	12.8
L089	2.2	0.2	-1.8	2.2	-3.8	2.2	-3.8	0.2	4.2	2.2
L096R	13.4	11.4	19.4	15.4	19.4	13.4	17.4	13.4	13.4	11.4
L142R	0.2	4.2	-1.8	2.2	4.2	8.2	4.2	8.2	2.4	11.2
Mean	3.4	5.1	5.1	7.1	6.1	7.1	4.5	6.4	7.3	7.3
S.D.	5.7	6.6	8.9	7.9	9.0	8.8	7.7	4.7	6.9	5.3

Temporary Threshold Shift (dB): 775 Hz center frequency, 139 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	14.0	32.0	40.0	38.0	16.0	4.0	12.0	10.0	-2.0	-1.0	-6.0	2.0	0.0	-2.0	-4.0	40.0
L053	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	4.0
L084	36.0	15.0	24.0	-7.0	22.0	-9.0	10.0	-1.0	-2.0	7.0	16.0	5.0	2.0	1.0	10.0	36.0
L089	29.0	27.0	15.0	13.0	-1.0	-3.0	5.0	-7.0	1.0	-2.0	6.0	4.0	2.0	0.0	-1.0	29.0
L096R	49.0	17.0	36.0	35.0	24.0	24.0	12.0	11.0	7.0	11.0	18.0	17.0	15.0	14.0	3.0	49.0
L142R	29.0	17.0	5.0	13.0	19.0	27.0	5.0	11.0	9.0	-2.0	-4.0	4.0	2.0	0.0	-1.0	29.0
Mean	26.2	17.7	19.3	16.0	13.7	7.2	7.0	3.3	2.8	2.5	5.0	5.0	2.8	2.8	1.5	31.2
S.D.	17.1	11.7	17.3	17.5	10.6	14.9	5.4	8.3	4.6	5.4	10.2	6.4	6.4	5.8	4.8	15.3

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	40.0	38.0	56.0	34.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	56.0
L053	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	4.0
L084	36.0	45.0	4.0	23.0	2.0	1.0	40.0	29.0	8.0	17.0	16.0	15.0	12.0	21.0	10.0	45.0
L089	25.0	33.0	21.0	29.0	5.0	3.0	1.0	-1.0	-3.0	4.0	2.0	0.0	-2.0	-4.0	5.0	33.0
L096R	46.0	33.0	42.0	41.0	40.0	20.0	8.0	7.0	3.0	-3.0	14.0	13.0	11.0	10.0	9.0	46.0
L142R	55.0	53.0	51.0	29.0	65.0	13.0	21.0	27.0	15.0	4.0	12.0	0.0	-2.0	6.0	5.0	65.0
Mean	34.3	34.0	29.0	25.7	20.0	6.8	13.3	11.3	4.2	3.3	6.3	4.7	4.2	5.8	4.5	41.5
S.D.	17.9	17.5	24.1	14.8	26.9	9.3	14.9	13.3	6.7	7.5	8.9	7.4	6.4	9.0	5.1	21.3

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	40.0	38.0	46.0	34.0	12.0	10.0	8.0	16.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	46.0
L053	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	8.0
L084	12.0	31.0	50.0	19.0	38.0	7.0	16.0	15.0	34.0	3.0	12.0	21.0	8.0	17.0	6.0	50.0
L089	19.0	27.0	45.0	23.0	8.0	7.0	-5.0	3.0	1.0	-2.0	-4.0	-6.0	2.0	0.0	-1.0	45.0
L096R	61.0	49.0	48.0	57.0	46.0	15.0	14.0	33.0	9.0	13.0	30.0	19.0	17.0	16.0	15.0	61.0
L142R	37.0	35.0	33.0	11.0	17.0	25.0	13.0	9.0	7.0	6.0	-6.0	2.0	0.0	-2.0	-3.0	37.0
Mean	29.5	31.0	37.7	24.3	20.2	10.3	7.0	13.3	9.5	3.7	5.0	6.7	4.5	6.2	3.2	41.2
S.D.	20.2	14.4	17.5	19.3	18.0	9.1	9.3	11.0	12.4	5.3	13.8	11.1	7.3	8.3	6.6	18.0

Temporary Threshold Shift (dB): 775 Hz center frequency, 139 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	38.0	46.0	54.0	32.0	20.0	18.0	16.0	24.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	54.0
L053	14.0	12.0	0.0	-2.0	6.0	-6.0	2.0	0.0	8.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	14.0
L084	18.0	27.0	26.0	15.0	14.0	3.0	12.0	21.0	0.0	9.0	18.0	27.0	24.0	3.0	22.0	27.0
L089	15.0	33.0	21.0	19.0	15.0	3.0	1.0	-1.0	-3.0	4.0	2.0	0.0	-2.0	6.0	5.0	33.0
L096R	55.0	53.0	52.0	41.0	40.0	19.0	18.0	27.0	23.0	17.0	14.0	23.0	21.0	10.0	9.0	55.0
L142R	35.0	23.0	21.0	19.0	15.0	33.0	21.0	7.0	15.0	4.0	2.0	0.0	-2.0	6.0	5.0	35.0
Mean	29.2	32.3	29.0	20.7	18.3	11.7	11.7	13.0	9.2	6.7	8.0	9.7	7.5	4.2	6.2	36.3
S.D.	16.3	15.1	20.6	14.8	11.5	14.2	8.4	12.5	9.7	7.1	6.7	12.1	11.9	4.1	9.0	15.9

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	32.0	40.0	48.0	26.0	14.0	12.0	10.0	18.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	48.0
L053	22.0	10.0	8.0	6.0	-6.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	6.0	4.0	22.0
L084	44.0	33.0	42.0	10.0	20.0	-1.0	18.0	17.0	16.0	14.0	24.0	13.0	20.0	9.0	8.0	44.0
L089	13.0	41.0	19.0	17.0	13.0	1.0	-1.0	7.0	5.0	2.0	0.0	-2.0	-4.0	-6.0	-7.0	41.0
L096R	65.0	53.0	62.0	51.0	40.0	19.0	18.0	7.0	3.0	17.0	14.0	13.0	41.0	10.0	19.0	65.0
L142R	31.0	19.0	17.0	25.0	11.0	9.0	7.0	13.0	11.0	10.0	8.0	6.0	4.0	2.0	1.0	31.0
Mean	34.5	32.7	32.7	22.5	15.3	7.0	8.7	10.0	6.2	8.5	8.3	5.0	9.5	2.8	4.8	41.8
S.D.	18.2	15.7	21.1	16.1	14.9	7.7	8.3	7.5	6.8	6.1	9.2	6.8	17.8	6.7	8.6	14.8

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	36.0	34.0	52.0	30.0	18.0	16.0	4.0	12.0	10.0	8.0	6.0	-6.0	2.0	0.0	-2.0	52.0
L053	10.0	8.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	10.0
L084	24.0	43.0	22.0	51.0	40.0	-1.0	8.0	7.0	16.0	15.0	24.0	23.0	20.0	19.0	18.0	51.0
L089	15.0	43.0	41.0	19.0	25.0	23.0	11.0	9.0	-3.0	-6.0	2.0	0.0	-2.0	6.0	5.0	43.0
L096R	63.0	51.0	50.0	49.0	28.0	57.0	16.0	25.0	21.0	35.0	22.0	11.0	9.0	18.0	7.0	63.0
L142R	23.0	31.0	19.0	17.0	23.0	11.0	19.0	15.0	13.0	12.0	10.0	8.0	6.0	4.0	13.0	31.0
Mean	28.5	35.0	30.0	26.7	22.7	17.7	9.3	10.7	8.5	11.0	10.7	5.7	5.2	6.8	7.2	41.7
S.D.	19.1	15.0	21.7	21.5	12.5	21.4	7.7	9.6	10.8	13.9	10.2	10.6	8.7	9.9	7.3	18.8

Temporary Threshold Shift (dB): 775 Hz center frequency, 139 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	26.0	44.0	52.0	30.0	18.0	16.0	4.0	12.0	10.0	8.0	6.0	-6.0	2.0	0.0	-2.0	52.0
L053	22.0	10.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	6.0	-6.0	22.0
L084	32.0	51.0	20.0	29.0	18.0	7.0	46.0	25.0	14.0	13.0	4.0	21.0	8.0	7.0	6.0	51.0
L089	23.0	41.0	39.0	17.0	13.0	11.0	9.0	7.0	5.0	2.0	0.0	-2.0	-4.0	-6.0	-7.0	41.0
L096R	35.0	53.0	42.0	51.0	40.0	19.0	18.0	7.0	13.0	7.0	34.0	3.0	21.0	10.0	19.0	53.0
L142R	61.0	49.0	17.0	25.0	21.0	9.0	7.0	13.0	9.0	10.0	8.0	6.0	4.0	2.0	1.0	61.0
Mean	33.2	41.3	28.0	24.7	19.0	10.7	14.0	10.3	7.8	5.7	9.0	3.7	4.8	3.2	1.8	46.7
S.D.	14.6	16.0	19.9	18.0	11.9	6.2	16.8	8.9	6.6	6.8	12.6	9.4	9.0	5.7	9.7	13.7

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	16.0	34.0	52.0	20.0	18.0	16.0	4.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	8.0	52.0
L053	12.0	10.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	12.0
L084	50.0	9.0	18.0	7.0	36.0	-5.0	14.0	33.0	2.0	11.0	10.0	9.0	6.0	5.0	14.0	50.0
L089	13.0	41.0	29.0	37.0	23.0	21.0	9.0	7.0	5.0	2.0	0.0	-2.0	6.0	-6.0	3.0	41.0
L096R	41.0	29.0	38.0	17.0	26.0	6.0	14.0	23.0	19.0	13.0	20.0	19.0	7.0	16.0	5.0	41.0
L142R	41.0	39.0	37.0	15.0	21.0	39.0	37.0	13.0	11.0	10.0	8.0	6.0	4.0	12.0	11.0	41.0
Mean	28.8	27.0	28.7	15.3	21.3	13.2	13.0	14.3	8.8	8.0	7.7	6.0	5.5	5.5	7.5	39.5
S.D.	17.0	14.2	18.7	13.7	10.5	15.8	13.0	12.3	6.0	4.2	7.1	7.5	2.2	7.9	4.3	14.4

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	24.0	42.0	60.0	28.0	16.0	14.0	2.0	10.0	8.0	6.0	4.0	2.0	10.0	8.0	6.0	60.0
L053	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	8.0
L084	31.0	30.0	39.0	8.0	17.0	6.0	25.0	14.0	13.0	12.0	21.0	20.0	27.0	16.0	5.0	39.0
L089	51.0	49.0	47.0	25.0	21.0	9.0	7.0	5.0	3.0	0.0	8.0	6.0	4.0	2.0	1.0	51.0
L096R	29.0	47.0	36.0	45.0	34.0	24.0	22.0	11.0	7.0	11.0	28.0	7.0	5.0	14.0	13.0	47.0
L142R	39.0	27.0	25.0	23.0	19.0	17.0	15.0	1.0	11.0	8.0	7.0	4.0	2.0	0.0	-1.0	39.0
Mean	30.3	33.5	35.2	21.8	17.8	11.3	12.8	7.5	7.3	6.2	11.0	5.8	8.7	7.0	4.0	40.7
S.D.	14.4	16.2	19.2	15.3	10.9	9.1	9.3	4.9	4.3	5.2	11.2	8.0	9.4	6.8	5.2	17.9

Temporary Threshold Shift (dB): 775 Hz center frequency, 139 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L051	14.0	32.0	50.0	18.0	16.0	14.0	2.0	10.0	8.0	6.0	4.0	2.0	10.0	8.0	6.0	50.0
L053	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	6.0
L084	16.0	37.0	16.0	31.0	20.0	-1.0	42.0	21.0	10.0	19.0	18.0	7.0	24.0	13.0	2.0	42.0
L089	39.0	47.0	45.0	23.0	9.0	17.0	15.0	3.0	1.0	-2.0	6.0	4.0	2.0	0.0	-1.0	47.0
L096R	5.0	43.0	32.0	41.0	40.0	0.0	10.0	7.0	13.0	-1.0	14.0	3.0	21.0	10.0	9.0	43.0
L142R	20.0	28.0	26.0	44.0	50.0	38.0	16.0	2.0	10.0	9.0	7.0	15.0	13.0	11.0	10.0	50.0
Mean	16.7	31.8	28.5	26.2	22.2	10.7	13.2	7.5	7.0	4.8	7.5	5.8	12.0	7.0	4.0	39.7
S.D.	12.4	15.3	18.0	16.3	19.5	15.9	16.4	7.3	5.3	8.3	7.7	4.8	9.3	5.7	5.1	16.8

775 Hz center frequency, 139 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
L051	7	325	368	205	898
L053	6	31	35	159	225
L084	3	89	43	91	223
L089	4	21	37	61	119
L096R	9	280	288	104	672
L142R	10	16	24	46	86
Group mean	7				371
S.D.	3				334
S.E.	1				136

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.3	60.2
	0.25 kHz	1.0	62.7
	0.5 kHz	0.7	46.8
	1 kHz	0.3	154.0
	2 kHz	0.2	24.8
	4 kHz	1.2	4.5
	8 kHz	1.5	5.0
	16 kHz	0.3	12.5
Standard deviations			
	0.125 kHz	0.8	31.0
	0.25 kHz	1.3	35.3
	0.5 kHz	1.0	57.8
	1 kHz	0.5	224.2
	2 kHz	0.4	36.5
	4 kHz	1.5	1.9
	8 kHz	0.8	2.2
	16 kHz	0.5	9.0

775 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L051							
0.125 kHz	2	11	10	73	94	1	1
0.25 kHz	2	11	10	71	92	0	0
0.5 kHz	2	20	56	18	94	0	1
1 kHz	0	226	238	33	497	2	4
2 kHz	0	46	50	1	97	0	0
4 kHz	0	1	0	1	2	0	0
8 kHz	1	5	0	1	6	0	0
16 kHz	0	5	4	7	16	0	0
TOTALS	7	325	368	205	898	3	6
Chinchilla L053							
0.125 kHz	1	9	17	46	72	0	1
0.25 kHz	0	1	6	90	97	0	0
0.5 kHz	0	5	2	9	16	0	0
1 kHz	0	8	3	4	15	0	0
2 kHz	0	3	1	2	6	0	0
4 kHz	1	1	2	4	7	0	0
8 kHz	3	1	1	1	3	0	0
16 kHz	1	3	3	3	9	0	0
TOTALS	6	31	35	159	225	0	1
Chinchilla L084							
0.125 kHz	0	17	25	37	79	0	0
0.25 kHz	1	64	10	21	95	0	0
0.5 kHz	0	1	0	8	9	0	0
1 kHz	0	2	1	14	17	0	0
2 kHz	0	1	3	5	9	0	1
4 kHz	1	2	0	3	5	0	0
8 kHz	1	0	1	3	4	0	0
16 kHz	0	2	3	0	5	0	0
TOTALS	3	89	43	91	223	0	1

775 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L089							
0.125 kHz	1	4	3	8	15	1	0
0.25 kHz	0	7	9	22	38	0	0
0.5 kHz	0	2	8	4	14	0	0
1 kHz	1	0	2	2	4	0	0
2 kHz	0	1	0	3	4	0	0
4 kHz	0	3	1	2	6	0	0
8 kHz	1	1	2	6	9	0	0
16 kHz	1	3	12	14	29	0	0
TOTALS	4	21	37	61	119	1	0
Chinchilla L096R							
0.125 kHz	2	16	15	41	72	0	0
0.25 kHz	3	3	2	24	29	0	0
0.5 kHz	0	61	57	25	143	1	1
1 kHz	0	186	189	7	382	2	1
2 kHz	1	9	19	0	28	0	0
4 kHz	1	1	1	2	4	0	0
8 kHz	2	1	1	2	4	1	0
16 kHz	0	3	4	3	10	0	0
TOTALS	9	280	288	104	672	4	2
Chinchilla L142R							
0.125 kHz	2	1	10	18	29	0	0
0.25 kHz	0	2	6	17	25	0	0
0.5 kHz	2	0	1	4	5	0	0
1 kHz	1	5	2	2	9	0	0
2 kHz	0	2	2	1	5	1	1
4 kHz	4	1	1	1	3	0	0
8 kHz	1	3	1	0	4	0	0
16 kHz	0	2	1	3	6	0	0
TOTALS	10	16	24	46	86	1	1

775 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.3	9.7	13.3	37.2	60.2	0.3	0.3
0.25 kHz	1.0	14.7	7.2	40.8	62.7	0.0	0.0
0.5 kHz	0.7	14.8	20.7	11.3	46.8	0.2	0.3
1 kHz	0.3	71.2	72.5	10.3	154.0	0.7	0.8
2 kHz	0.2	10.3	12.5	2.0	24.8	0.2	0.3
4 kHz	1.2	1.5	0.8	2.2	4.5	0.0	0.0
8 kHz	1.5	1.8	1.0	2.2	5.0	0.2	0.0
16 kHz	0.3	3.0	4.5	5.0	12.5	0.0	0.0
TOTALS	6.5	127.0	132.5	111.0	370.5	1.5	1.8
Group standard deviations							
0.125 kHz	0.8	6.4	7.5	22.8	31.0	0.5	0.5
0.25 kHz	1.3	24.5	3.1	31.4	35.3	0.0	0.0
0.5 kHz	1.0	23.8	27.9	8.4	57.8	0.4	0.5
1 kHz	0.5	105.2	110.3	12.0	224.2	1.0	1.6
2 kHz	0.4	17.7	19.7	1.8	36.5	0.4	0.5
4 kHz	1.5	0.8	0.8	1.2	1.9	0.0	0.0
8 kHz	0.8	1.8	0.6	2.1	2.2	0.4	0.0
16 kHz	0.5	1.1	3.8	4.9	9.0	0.0	0.0
TOTALS	2.7	139.2	153.7	60.5	333.5	1.6	2.1

775 Hz center frequency, 139 dB peak SPL

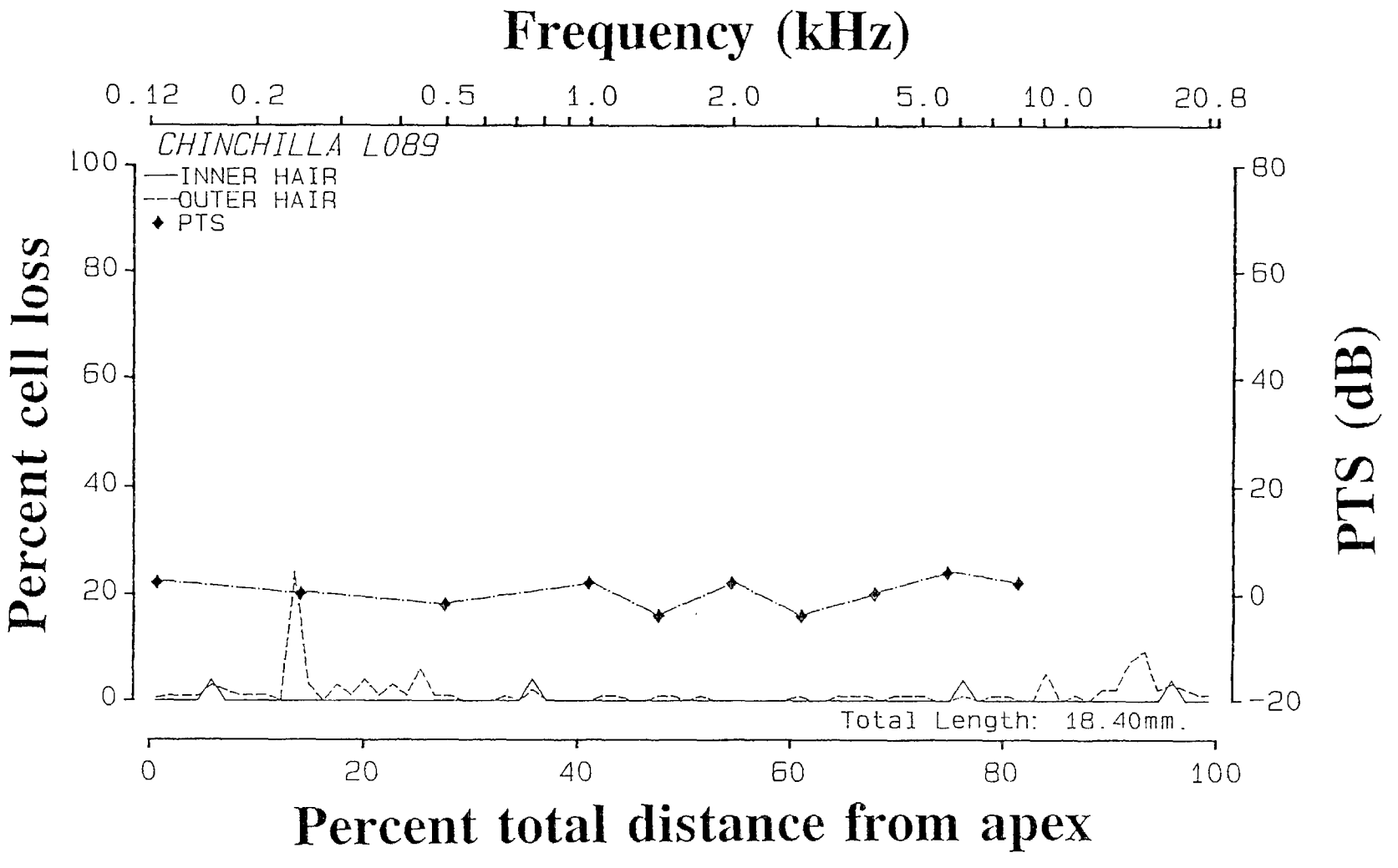
Percent sensory cell losses over octave band frequencies

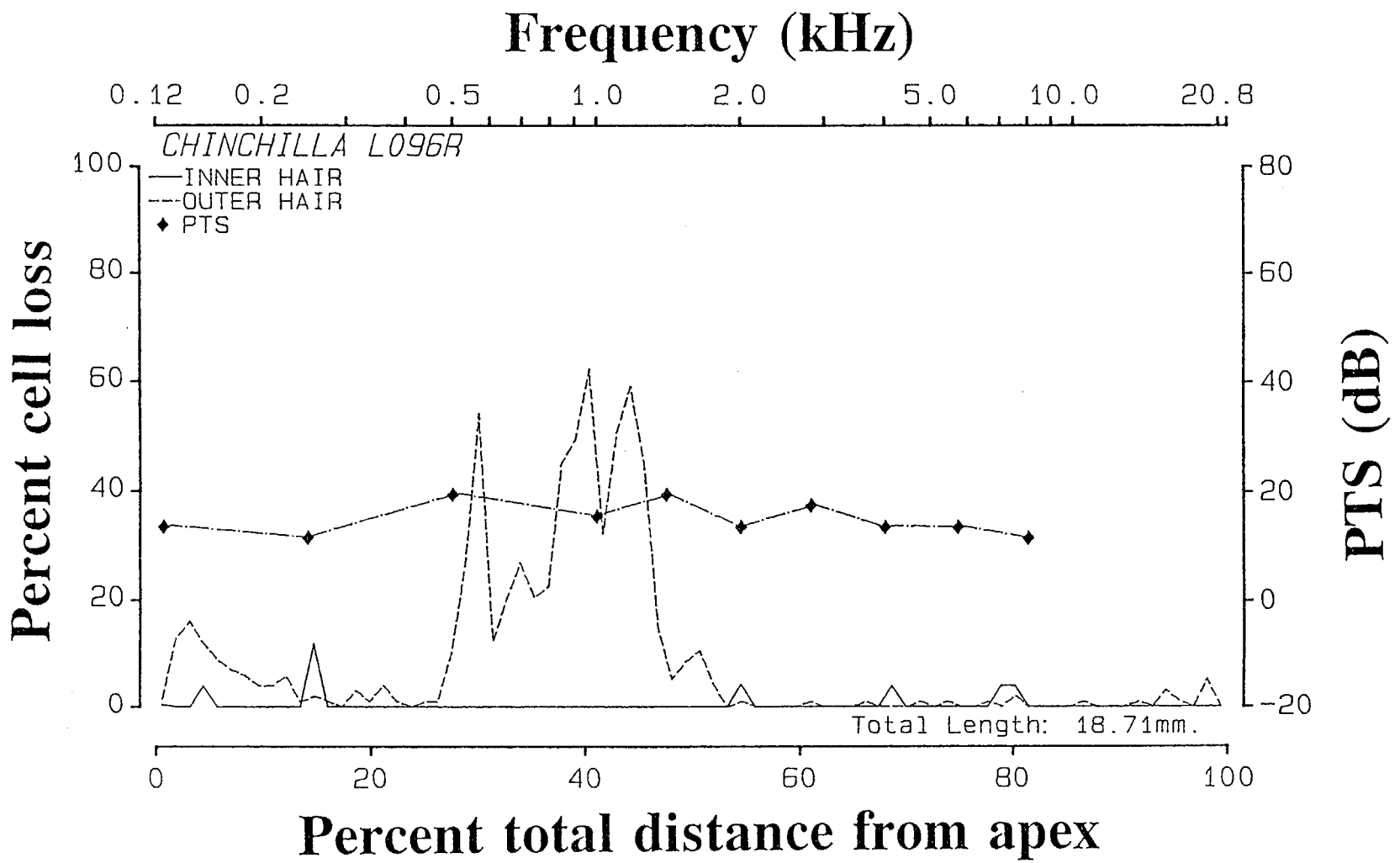
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L051							
0.125 kHz	1.4	5.9	5.3	39.2	16.8	0.3	0.5
0.25 kHz	0.8	3.3	3.0	21.8	9.4	0.0	0.0
0.5 kHz	0.8	6.1	17.2	5.5	9.6	0.0	0.3
1 kHz	0.0	72.9	76.7	10.6	53.4	0.4	1.2
2 kHz	0.0	14.5	15.8	0.3	10.2	0.0	0.0
4 kHz	0.0	0.3	0.0	0.3	0.2	0.0	0.0
8 kHz	0.3	1.5	0.0	0.3	0.6	0.0	0.0
16 kHz	0.0	1.6	1.3	2.3	1.7	0.0	0.0
Chinchilla L053							
0.125 kHz	0.7	5.0	9.4	25.6	13.3	0.0	0.5
0.25 kHz	0.0	0.3	1.9	28.6	10.3	0.0	0.0
0.5 kHz	0.0	1.5	0.6	2.8	1.6	0.0	0.0
1 kHz	0.0	2.6	1.0	1.3	1.6	0.0	0.0
2 kHz	0.0	0.9	0.3	0.6	0.6	0.0	0.0
4 kHz	0.4	0.3	0.6	1.3	0.7	0.0	0.0
8 kHz	1.2	0.3	0.3	0.3	0.3	0.0	0.0
16 kHz	0.4	1.0	1.0	1.0	1.0	0.0	0.0
Chinchilla L084							
0.125 kHz	0.0	8.6	12.6	18.7	13.3	0.0	0.0
0.25 kHz	0.3	18.6	2.9	6.1	9.2	0.0	0.0
0.5 kHz	0.0	0.2	0.0	2.3	0.8	0.0	0.0
1 kHz	0.0	0.6	0.3	4.2	1.7	0.0	0.0
2 kHz	0.0	0.2	0.8	1.4	0.8	0.0	0.2
4 kHz	0.3	0.5	0.0	0.8	0.4	0.0	0.0
8 kHz	0.3	0.0	0.2	0.8	0.3	0.0	0.0
16 kHz	0.0	0.6	1.0	0.0	0.5	0.0	0.0

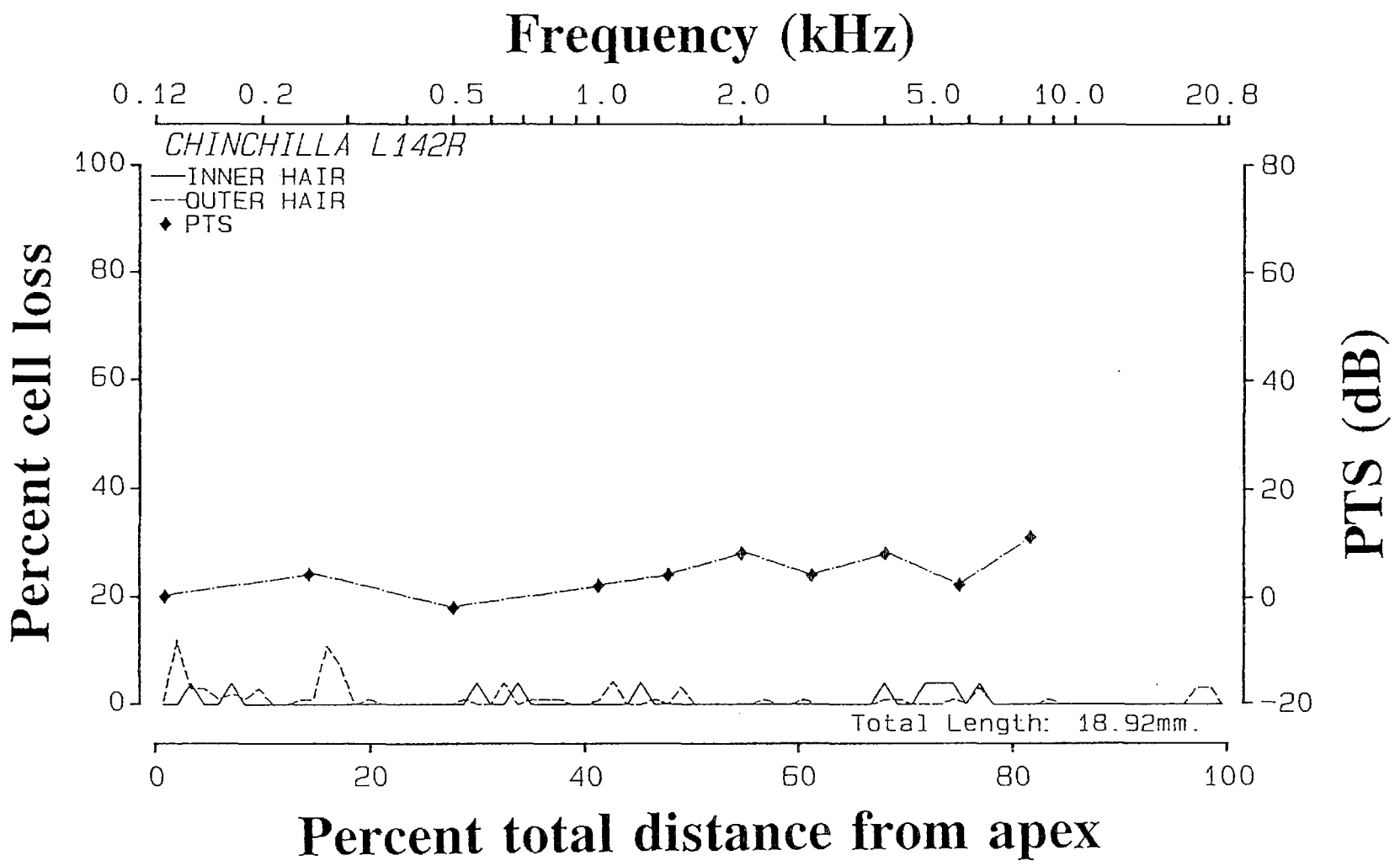
775 Hz center frequency, 139 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L089							
0.125 kHz	0.6	2.1	1.5	4.2	2.6	0.3	0.0
0.25 kHz	0.0	2.1	2.7	6.6	3.8	0.0	0.0
0.5 kHz	0.0	0.6	2.4	1.2	1.4	0.0	0.0
1 kHz	0.4	0.0	0.6	0.6	0.4	0.0	0.0
2 kHz	0.0	0.3	0.0	0.9	0.4	0.0	0.0
4 kHz	0.0	0.9	0.3	0.6	0.6	0.0	0.0
8 kHz	0.3	0.3	0.6	1.8	0.9	0.0	0.0
16 kHz	0.4	1.0	4.0	4.6	3.2	0.0	0.0
Chinchilla L096R							
0.125 kHz	1.3	8.3	7.8	21.3	12.5	0.0	0.0
0.25 kHz	1.1	0.8	0.5	7.1	2.8	0.0	0.0
0.5 kHz	0.0	18.2	17.0	7.4	14.2	0.1	0.2
1 kHz	0.0	58.3	59.2	2.1	39.9	0.3	0.3
2 kHz	0.4	2.7	5.8	0.0	2.8	0.0	0.0
4 kHz	0.3	0.3	0.3	0.6	0.4	0.0	0.0
8 kHz	0.7	0.3	0.3	0.6	0.4	0.1	0.0
16 kHz	0.0	1.0	1.3	1.0	1.1	0.0	0.0
Chinchilla L142R							
0.125 kHz	1.3	0.5	5.1	9.2	4.9	0.0	0.0
0.25 kHz	0.0	0.5	1.7	5.0	2.4	0.0	0.0
0.5 kHz	0.7	0.0	0.2	1.1	0.4	0.0	0.0
1 kHz	0.4	1.5	0.6	0.6	0.9	0.0	0.0
2 kHz	0.0	0.6	0.6	0.3	0.5	0.1	0.3
4 kHz	1.5	0.3	0.3	0.3	0.3	0.0	0.0
8 kHz	0.3	0.9	0.3	0.0	0.4	0.0	0.0
16 kHz	0.0	0.6	0.3	0.9	0.6	0.0	0.0


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L089
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.40mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L096R
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.71mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L142R
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.92mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

775 Hz center frequency, 144 dB peak SPL

Animal #		
P19	–	Completed the entire protocol
S15	–	Completed the entire protocol
S27	–	Completed the entire protocol
S31	–	Completed the entire protocol
S33	–	Completed the entire protocol
S34	–	Completed the entire protocol

775 Hz center frequency, 144 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P19	24.0	5.0	5.0	3.0	4.0	0.0	2.0	0.0	5.0	2.0
S15	20.0	7.0	3.0	1.0	0.0	2.0	4.0	0.0	5.0	2.0
S27	24.0	5.0	5.0	3.0	4.0	0.0	2.0	0.0	5.0	2.0
S31	22.0	9.0	1.0	-1.0	-2.0	-2.0	2.0	-2.0	3.0	4.0
S33	22.0	7.0	1.0	3.0	0.0	0.0	0.0	0.0	3.0	6.0
S34	23.0	11.0	-2.0	2.0	1.0	1.0	-1.0	1.0	-2.0	6.0
Mean	22.5	7.3	2.2	1.8	1.2	0.2	1.5	-0.2	3.2	3.7
S.D.	1.5	2.3	2.7	1.6	2.4	1.3	1.8	1.0	2.7	2.0

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P19	50.0	41.0	37.0	35.0	30.0	38.0	38.0	36.0	37.0	38.0
S15	61.6	50.6	48.6	46.6	37.6	45.6	55.6	33.6	44.6	31.6
S27	38.0	33.0	31.0	29.0	26.0	22.0	24.0	18.0	27.0	24.0
S31	45.6	46.6	40.6	38.6	39.6	39.6	51.6	27.6	46.6	43.6
S33	57.8	40.8	42.8	44.8	43.8	43.8	36.0	41.8	36.8	25.8
S34	54.6	45.6	49.6	47.6	44.6	46.6	50.6	42.6	41.6	46.8
Mean	51.3	42.9	41.6	40.3	36.9	39.3	42.6	33.3	38.9	35.0
S.D.	8.6	6.1	7.1	7.4	7.5	9.1	12.0	9.3	7.1	9.4

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P19	26.0	36.0	32.0	32.0	26.0	38.0	36.0	36.0	32.0	36.0
S15	41.6	43.6	45.6	45.6	37.6	43.6	51.6	33.6	39.6	29.6
S27	14.0	28.0	26.0	26.0	22.0	22.0	22.0	18.0	22.0	22.0
S31	23.6	37.6	39.6	39.6	41.6	41.6	49.6	29.6	43.6	39.6
S33	35.8	33.8	41.8	41.8	43.8	43.8	36.0	41.8	33.8	19.8
S34	31.6	34.6	51.6	45.6	43.6	45.6	51.6	41.6	43.6	40.8
Mean	28.8	35.6	39.4	38.4	35.8	39.1	41.1	33.4	35.8	31.3
S.D.	9.7	5.1	9.3	7.9	9.5	8.8	11.9	8.9	8.3	9.0

Temporary Threshold Shift (dB): 775 Hz center frequency, 144 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	70.0	70.0	56.0	64.0	70.0	60.0	48.0	46.0	44.0	32.0	30.0	28.0	16.0	24.0	32.0	70.0
S15	69.0	67.0	69.0	74.0	69.0	58.0	46.0	44.0	42.0	40.0	49.0	57.0	35.0	33.0	34.0	74.0
S27	70.0	70.0	70.0	70.0	70.0	62.0	40.0	28.0	39.0	34.0	22.0	10.0	18.0	6.0	14.0	70.0
S31	57.0	45.0	53.0	51.0	39.0	26.0	14.0	22.0	20.0	18.0	27.0	25.0	23.0	21.0	22.0	57.0
S33	66.0	45.0	55.0	70.0	72.0	52.0	41.0	30.0	29.0	38.0	36.0	35.0	33.0	32.0	43.0	72.0
S34	71.0	71.0	62.0	68.0	60.0	59.0	48.0	37.0	36.0	35.0	37.0	24.0	33.0	31.0	33.0	71.0
Mean	67.2	61.3	60.8	66.2	63.3	52.8	39.5	34.5	35.0	32.8	33.5	29.8	26.3	24.5	29.7	69.0
S.D.	5.3	12.7	7.4	8.1	12.6	13.6	13.0	9.5	9.0	7.8	9.4	15.6	8.4	10.3	10.2	6.1

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	80.0	90.0	76.0	84.0	90.0	80.0	58.0	46.0	44.0	42.0	40.0	38.0	26.0	34.0	42.0	90.0
S15	63.0	81.0	88.0	88.0	83.0	72.0	50.0	38.0	36.0	54.0	53.0	41.0	39.0	47.0	38.0	88.0
S27	92.0	92.0	92.0	92.0	92.0	74.0	62.0	50.0	51.0	46.0	34.0	32.0	30.0	28.0	16.0	92.0
S31	81.0	49.0	57.0	55.0	53.0	40.0	38.0	36.0	34.0	32.0	41.0	39.0	37.0	35.0	36.0	81.0
S33	62.0	71.0	81.0	88.0	88.0	68.0	57.0	46.0	45.0	34.0	32.0	31.0	39.0	28.0	39.0	88.0
S34	84.0	84.0	84.0	81.0	73.0	72.0	56.0	40.0	49.0	28.0	30.0	37.0	36.0	34.0	36.0	84.0
Mean	77.0	77.8	79.7	81.3	79.8	67.7	53.5	42.7	43.2	39.3	38.3	36.3	34.5	34.3	34.5	87.2
S.D.	12.0	16.0	12.4	13.4	14.8	14.1	8.5	5.5	6.8	9.8	8.4	4.0	5.3	6.9	9.3	4.0

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	94.0	82.0	94.0	94.0	86.0	64.0	52.0	50.0	38.0	36.0	34.0	32.0	30.0	38.0	26.0	94.0
S15	61.0	59.0	67.0	91.0	73.0	70.0	58.0	46.0	44.0	52.0	41.0	49.0	47.0	45.0	46.0	91.0
S27	86.0	84.0	94.0	94.0	93.0	76.0	64.0	52.0	53.0	48.0	36.0	24.0	32.0	10.0	28.0	94.0
S31	53.0	61.0	69.0	67.0	45.0	32.0	30.0	38.0	36.0	44.0	43.0	41.0	49.0	37.0	28.0	69.0
S33	62.0	71.0	81.0	90.0	96.0	78.0	67.0	36.0	35.0	34.0	42.0	41.0	49.0	38.0	39.0	96.0
S34	101.0	101.0	101.0	101.0	70.0	69.0	68.0	47.0	46.0	45.0	47.0	54.0	63.0	51.0	43.0	101.0
Mean	76.2	76.3	84.3	89.5	77.2	64.8	56.5	44.8	42.0	43.2	40.5	40.2	45.0	36.5	35.0	90.8
S.D.	20.0	15.9	14.2	11.7	18.9	16.9	14.3	6.5	7.0	6.9	4.8	10.9	12.3	14.1	8.7	11.2

Temporary Threshold Shift (dB): 775 Hz center frequency, 144 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	98.0	86.0	84.0	82.0	80.0	68.0	56.0	64.0	52.0	40.0	38.0	26.0	24.0	32.0	40.0	98.0
S15	65.0	63.0	61.0	79.0	67.0	64.0	52.0	40.0	48.0	36.0	45.0	43.0	51.0	39.0	50.0	79.0
S27	82.0	80.0	78.0	86.0	84.0	82.0	60.0	58.0	59.0	54.0	22.0	30.0	28.0	26.0	24.0	86.0
S31	57.0	65.0	73.0	71.0	49.0	36.0	34.0	32.0	40.0	28.0	37.0	45.0	43.0	41.0	32.0	73.0
S33	62.0	61.0	81.0	80.0	79.0	68.0	57.0	46.0	45.0	34.0	52.0	41.0	29.0	38.0	49.0	81.0
S34	72.0	91.0	90.0	89.0	78.0	57.0	66.0	55.0	44.0	53.0	45.0	52.0	51.0	39.0	41.0	91.0
Mean	72.7	74.3	77.8	81.2	72.8	62.5	54.2	49.2	48.0	40.8	39.8	39.5	37.7	35.8	39.3	84.7
S.D.	15.1	13.0	10.0	6.2	13.0	15.3	10.9	12.0	6.7	10.6	10.3	9.7	12.2	5.7	10.0	9.0

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	86.0	84.0	82.0	90.0	78.0	76.0	54.0	62.0	40.0	28.0	26.0	24.0	22.0	30.0	28.0	90.0
S15	65.0	53.0	81.0	79.0	77.0	64.0	42.0	40.0	38.0	36.0	45.0	33.0	31.0	39.0	40.0	81.0
S27	78.0	76.0	84.0	82.0	80.0	78.0	56.0	54.0	55.0	60.0	18.0	16.0	24.0	22.0	30.0	84.0
S31	67.0	55.0	73.0	71.0	49.0	36.0	34.0	32.0	30.0	28.0	37.0	35.0	53.0	41.0	42.0	73.0
S33	64.0	53.0	73.0	72.0	91.0	80.0	69.0	48.0	47.0	36.0	44.0	53.0	41.0	40.0	41.0	91.0
S34	72.0	91.0	80.0	89.0	78.0	67.0	56.0	45.0	34.0	43.0	45.0	52.0	51.0	39.0	31.0	91.0
Mean	72.0	68.7	78.8	80.5	75.5	66.8	51.8	46.8	40.7	38.5	35.8	35.5	37.0	35.2	35.3	85.0
S.D.	8.6	17.1	4.7	8.1	14.0	16.4	12.2	10.5	9.1	12.0	11.4	14.8	13.4	7.6	6.3	7.2

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	90.0	88.0	86.0	84.0	82.0	70.0	58.0	66.0	54.0	32.0	40.0	28.0	36.0	44.0	42.0	90.0
S15	73.0	71.0	69.0	87.0	85.0	72.0	70.0	38.0	26.0	34.0	53.0	41.0	39.0	37.0	48.0	87.0
S27	90.0	88.0	76.0	84.0	82.0	80.0	38.0	56.0	57.0	52.0	30.0	18.0	26.0	14.0	22.0	90.0
S31	67.0	65.0	93.0	71.0	69.0	36.0	34.0	32.0	30.0	48.0	47.0	45.0	43.0	31.0	42.0	93.0
S33	64.0	73.0	73.0	82.0	81.0	60.0	59.0	38.0	37.0	36.0	44.0	33.0	51.0	50.0	41.0	82.0
S34	72.0	81.0	90.0	89.0	88.0	67.0	76.0	55.0	54.0	53.0	55.0	42.0	41.0	39.0	51.0	90.0
Mean	76.0	77.7	81.2	82.8	81.2	64.2	55.8	47.5	43.0	42.5	44.8	34.5	39.3	35.8	41.0	88.7
S.D.	11.3	9.5	9.8	6.3	6.5	15.3	16.8	13.4	13.6	9.5	9.1	10.3	8.3	12.5	10.1	3.8

Temporary Threshold Shift (dB): 775 Hz center frequency, 144 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	88.0	98.0	84.0	82.0	70.0	68.0	66.0	54.0	42.0	30.0	48.0	26.0	24.0	42.0	40.0	98.0
S15	71.0	96.0	77.0	75.0	91.0	96.0	48.0	46.0	54.0	52.0	61.0	49.0	47.0	55.0	46.0	96.0
S27	70.0	98.0	66.0	84.0	97.0	90.0	58.0	56.0	67.0	52.0	30.0	28.0	16.0	14.0	22.0	98.0
S31	53.0	61.0	79.0	67.0	45.0	22.0	30.0	38.0	26.0	44.0	53.0	51.0	59.0	57.0	28.0	79.0
S33	64.0	73.0	63.0	92.0	61.0	60.0	59.0	38.0	37.0	26.0	34.0	33.0	42.0	40.0	31.0	92.0
S34	74.0	73.0	82.0	91.0	70.0	59.0	68.0	59.0	46.0	55.0	47.0	54.0	53.0	51.0	53.0	91.0
Mean	70.0	83.2	75.2	81.8	72.3	65.8	54.8	48.5	45.3	43.2	45.5	40.2	40.2	43.2	36.7	92.3
S.D.	11.5	16.1	8.7	9.6	19.2	26.5	14.1	9.2	14.1	12.4	11.6	12.5	16.8	15.8	11.7	7.2

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	80.0	88.0	76.0	74.0	72.0	60.0	48.0	56.0	54.0	32.0	40.0	28.0	36.0	34.0	42.0	88.0
S15	65.0	63.0	70.0	79.0	57.0	54.0	100.0	50.0	38.0	46.0	35.0	33.0	41.0	29.0	30.0	100.0
S27	72.0	70.0	68.0	66.0	74.0	72.0	60.0	48.0	59.0	54.0	22.0	20.0	18.0	16.0	14.0	74.0
S31	67.0	65.0	102.0	61.0	29.0	26.0	14.0	22.0	30.0	38.0	37.0	35.0	33.0	21.0	22.0	102.0
S33	64.0	63.0	63.0	92.0	81.0	60.0	59.0	48.0	47.0	46.0	44.0	43.0	41.0	40.0	41.0	92.0
S34	62.0	71.0	80.0	89.0	68.0	77.0	46.0	55.0	44.0	43.0	45.0	42.0	41.0	39.0	41.0	89.0
Mean	68.3	70.0	76.5	76.8	63.5	58.2	54.5	46.5	45.3	43.2	37.2	33.5	35.0	29.8	31.7	90.8
S.D.	6.7	9.5	13.9	12.3	18.7	17.9	27.8	12.5	10.5	7.6	8.4	8.7	9.0	9.8	11.7	10.1

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P19	84.0	94.0	80.0	78.0	66.0	64.0	52.0	50.0	38.0	36.0	44.0	22.0	20.0	38.0	36.0	94.0
S15	69.0	87.0	75.0	73.0	51.0	68.0	26.0	24.0	12.0	30.0	49.0	57.0	45.0	13.0	34.0	87.0
S27	68.0	76.0	64.0	62.0	96.0	68.0	66.0	54.0	55.0	50.0	38.0	26.0	24.0	12.0	10.0	96.0
S31	21.0	29.0	67.0	65.0	53.0	30.0	28.0	46.0	34.0	42.0	41.0	49.0	37.0	45.0	46.0	67.0
S33	60.0	69.0	69.0	68.0	57.0	66.0	65.0	34.0	33.0	32.0	30.0	39.0	47.0	26.0	27.0	69.0
S34	84.0	73.0	92.0	91.0	80.0	59.0	58.0	47.0	46.0	45.0	47.0	44.0	43.0	41.0	43.0	92.0
Mean	64.3	71.3	74.5	72.8	67.2	59.2	49.2	42.5	36.3	39.2	41.5	39.5	36.0	29.2	32.7	84.2
S.D.	23.3	22.7	10.3	10.6	17.7	14.7	17.9	11.3	14.5	7.8	6.9	13.5	11.4	14.4	13.0	12.9

775 Hz center frequency, 144 dB peak SPL

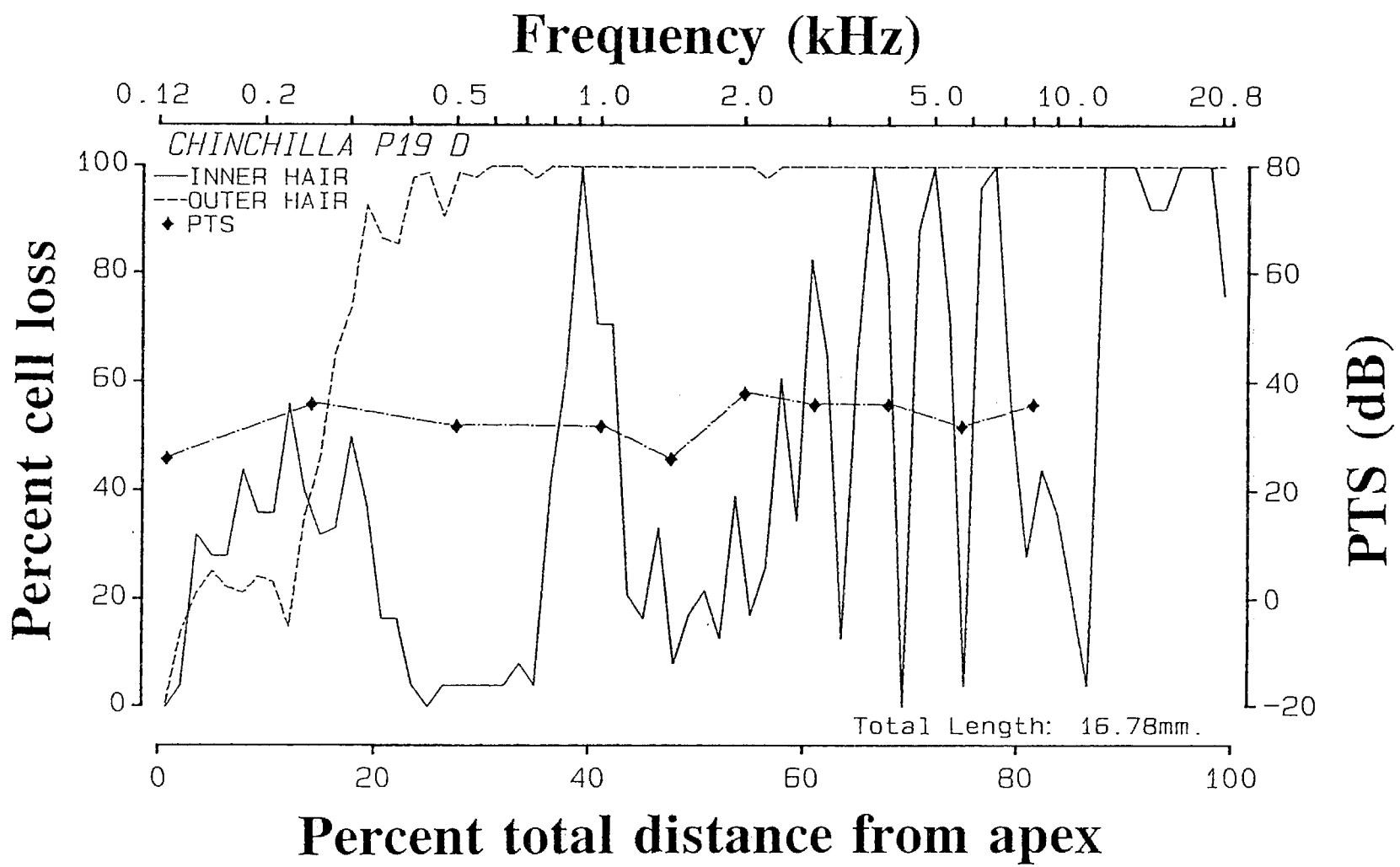
Percent sensory cell losses over octave band frequencies

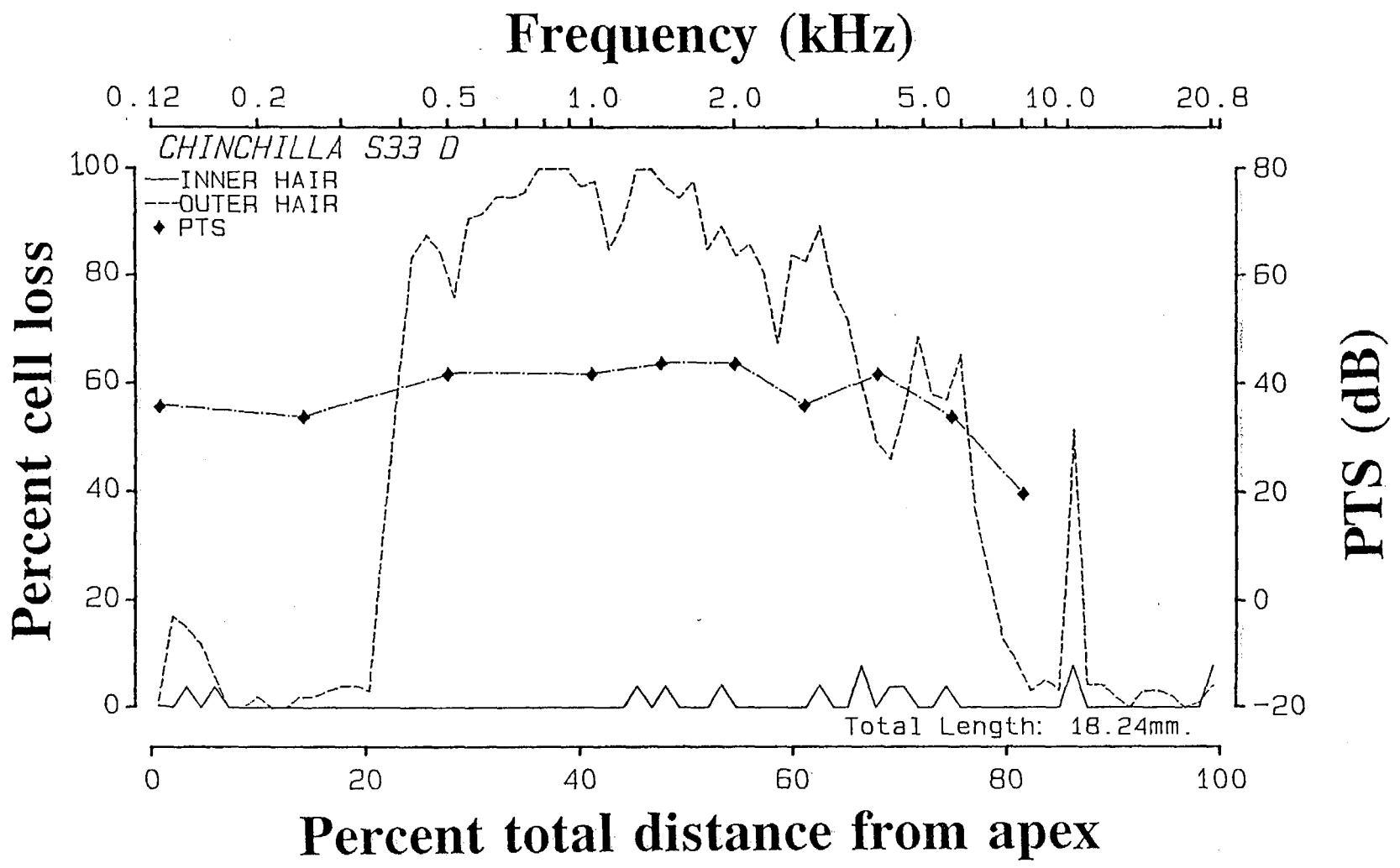
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S31D							
0.125 kHz	2.6	6.5	24.1	7.5	12.7	0.0	0.0
0.25 kHz	0.7	0.2	1.7	6.0	2.6	0.0	0.0
0.5 kHz	0.7	60.5	46.3	28.8	45.2	0.1	3.1
1 kHz	10.1	99.0	97.8	62.2	86.3	13.0	24.4
2 kHz	0.0	43.6	43.0	25.6	37.4	0.0	3.2
4 kHz	0.0	1.7	0.2	0.8	0.9	0.0	0.0
8 kHz	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16 kHz	0.0	0.3	1.6	0.6	0.8	0.0	0.0
Chinchilla S33D							
0.125 kHz	2.1	2.6	11.7	19.2	11.2	0.0	0.0
0.25 kHz	0.0	1.5	1.8	2.7	2.0	0.0	0.0
0.5 kHz	0.0	81.8	87.6	64.0	77.8	0.3	2.7
1 kHz	0.4	98.3	98.0	93.2	96.5	0.0	4.8
2 kHz	0.8	97.7	93.0	68.2	86.3	0.1	2.8
4 kHz	2.3	69.8	88.6	36.4	64.9	0.0	0.0
8 kHz	0.7	26.4	32.3	11.9	23.5	0.0	0.0
16 kHz	0.8	2.8	2.8	1.0	2.2	0.6	0.0
Chinchilla S34D							
0.125 kHz	0.6	7.2	4.6	6.7	6.2	0.3	0.0
0.25 kHz	1.5	5.3	6.5	5.3	5.7	0.0	0.8
0.5 kHz	3.9	83.3	76.2	45.4	68.3	1.5	30.5
1 kHz	4.4	100.0	99.3	98.7	99.3	1.9	47.3
2 kHz	2.0	99.0	99.6	88.4	95.7	0.1	18.5
4 kHz	0.7	100.0	100.0	98.1	99.4	0.3	0.6
8 kHz	1.1	99.6	100.0	99.0	99.5	0.0	0.0
16 kHz	0.0	83.7	85.6	83.7	84.3	0.0	4.1

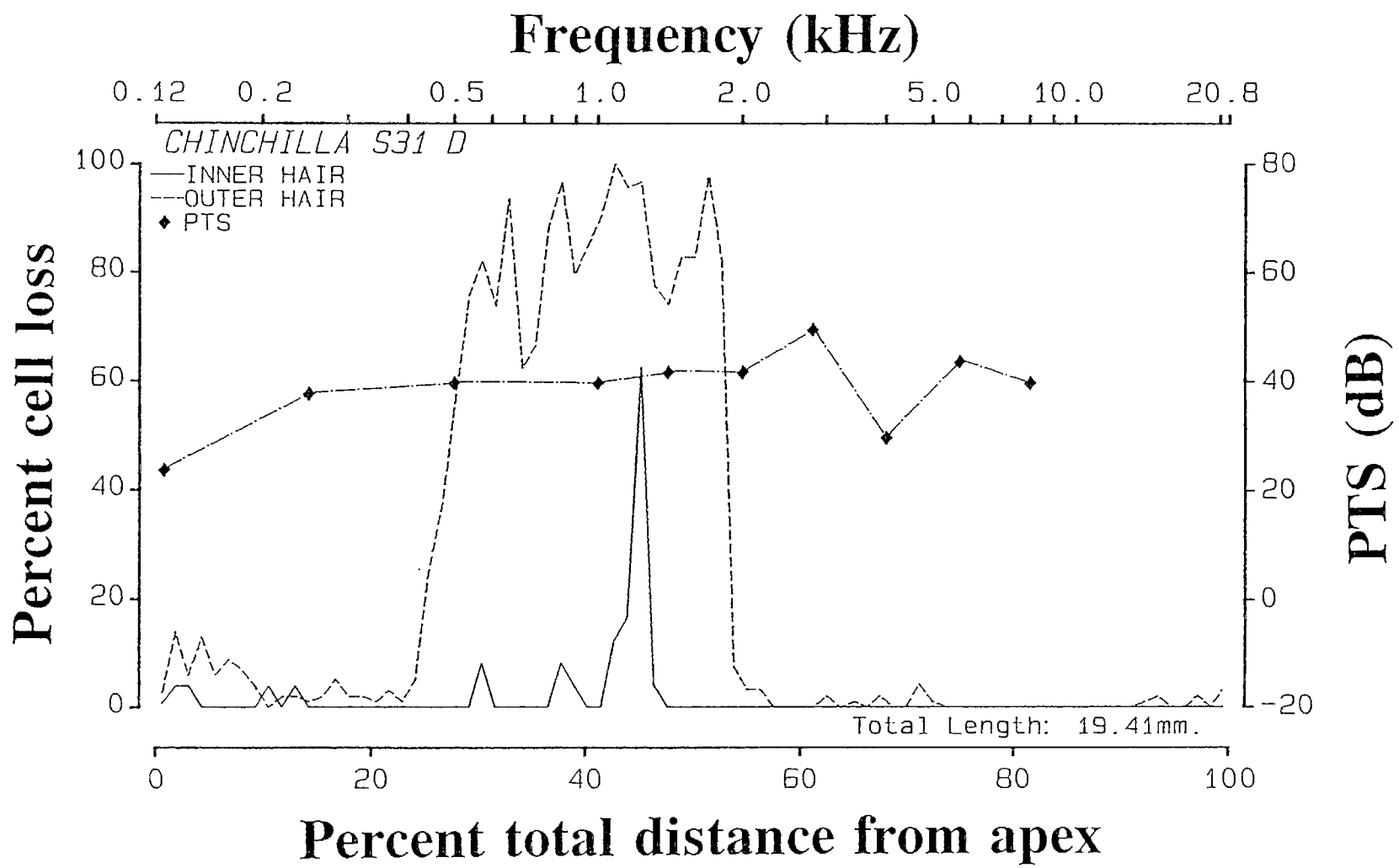
775 Hz center frequency, 144 dB peak SPL

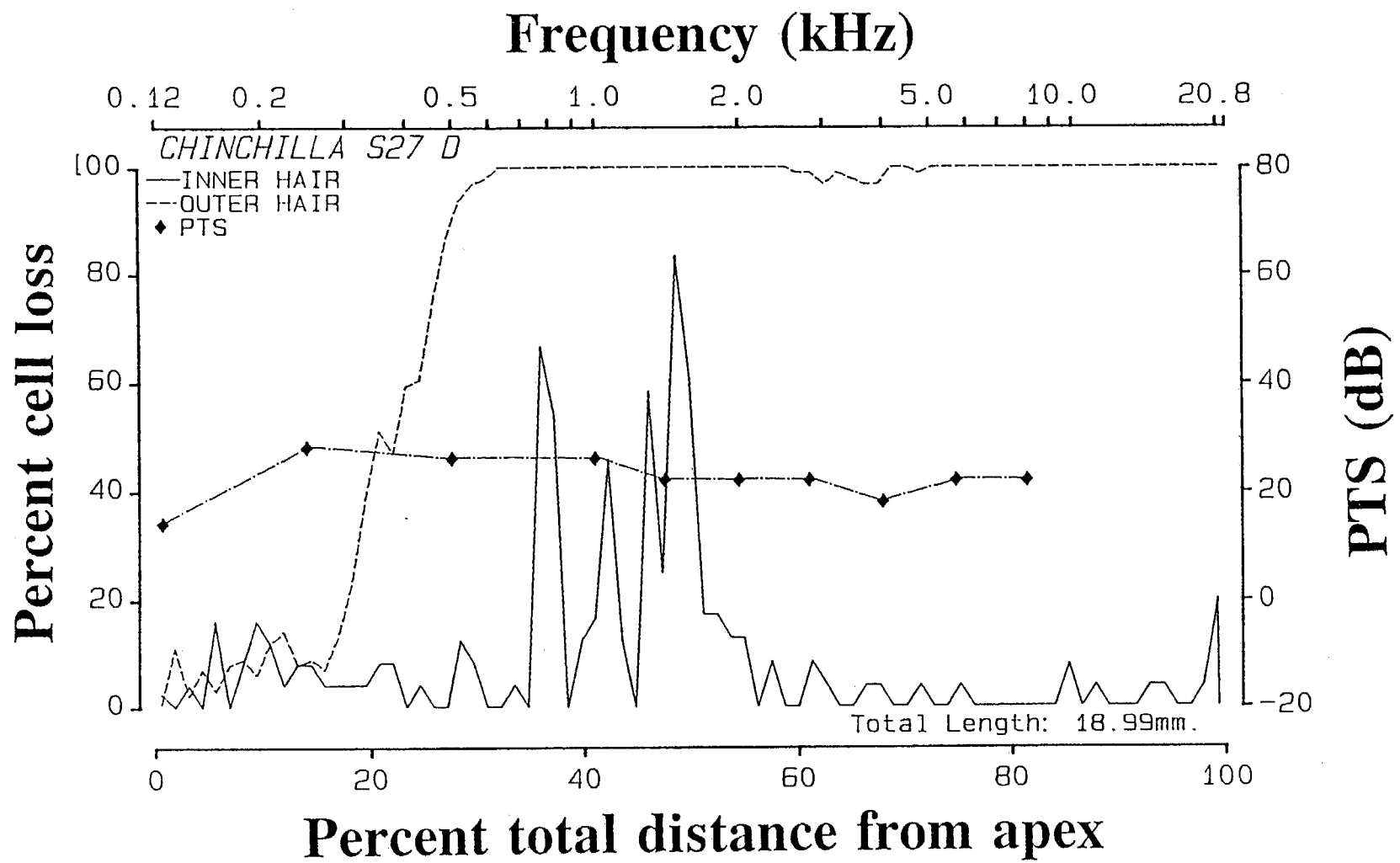
Percent sensory cell losses over octave band frequencies

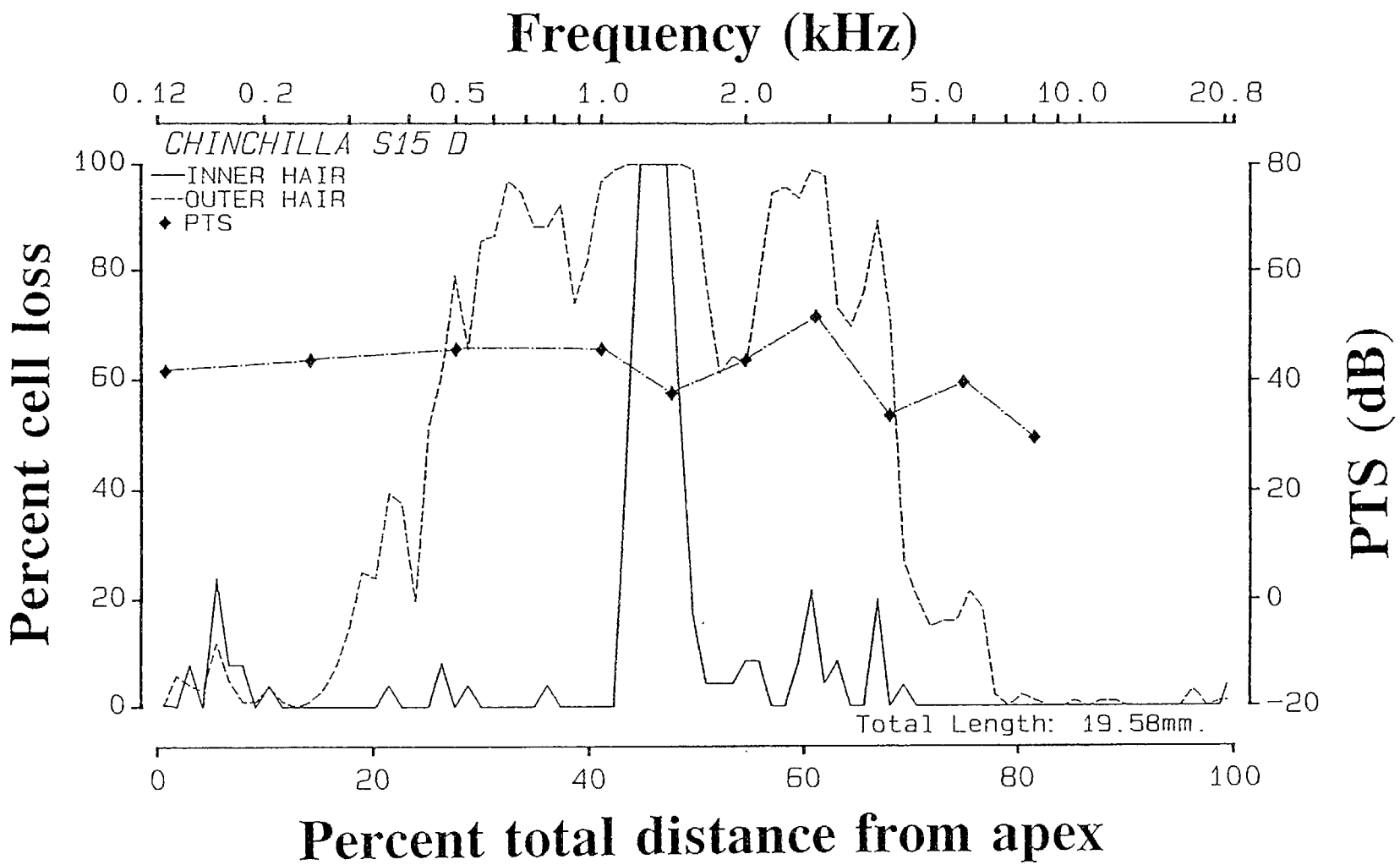
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	6.52	6.47	9.80	13.83	10.03	0.58	0.98
0.25 kHz	8.37	17.65	10.30	11.53	13.16	0.20	0.47
0.5 kHz	2.68	82.27	77.95	56.23	72.15	0.55	12.20
1 kHz	19.53	99.55	98.88	88.80	95.74	21.15	43.52
2 kHz	11.53	89.27	87.50	74.85	83.87	8.35	20.23
4 kHz	12.18	68.58	72.63	67.78	69.67	11.17	12.33
8 kHz	8.22	54.47	55.52	53.87	54.62	8.05	8.80
16 kHz	16.57	47.80	48.48	47.70	47.99	15.65	18.40
Group standard deviations							
0.125 kHz	6.81	4.59	7.47	10.37	4.95	1.02	1.64
0.25 kHz	15.53	21.07	15.49	15.49	16.97	0.29	0.52
0.5 kHz	2.33	12.63	18.08	22.70	17.30	0.71	13.03
1 kHz	17.52	0.73	1.01	15.16	5.42	19.60	28.00
2 kHz	12.67	22.44	22.24	27.97	23.72	10.31	20.09
4 kHz	25.37	40.63	41.00	40.67	39.06	25.57	24.57
8 kHz	18.57	50.63	50.10	50.37	50.17	19.28	20.69
16 kHz	38.59	51.58	51.45	51.68	51.57	37.50	39.88

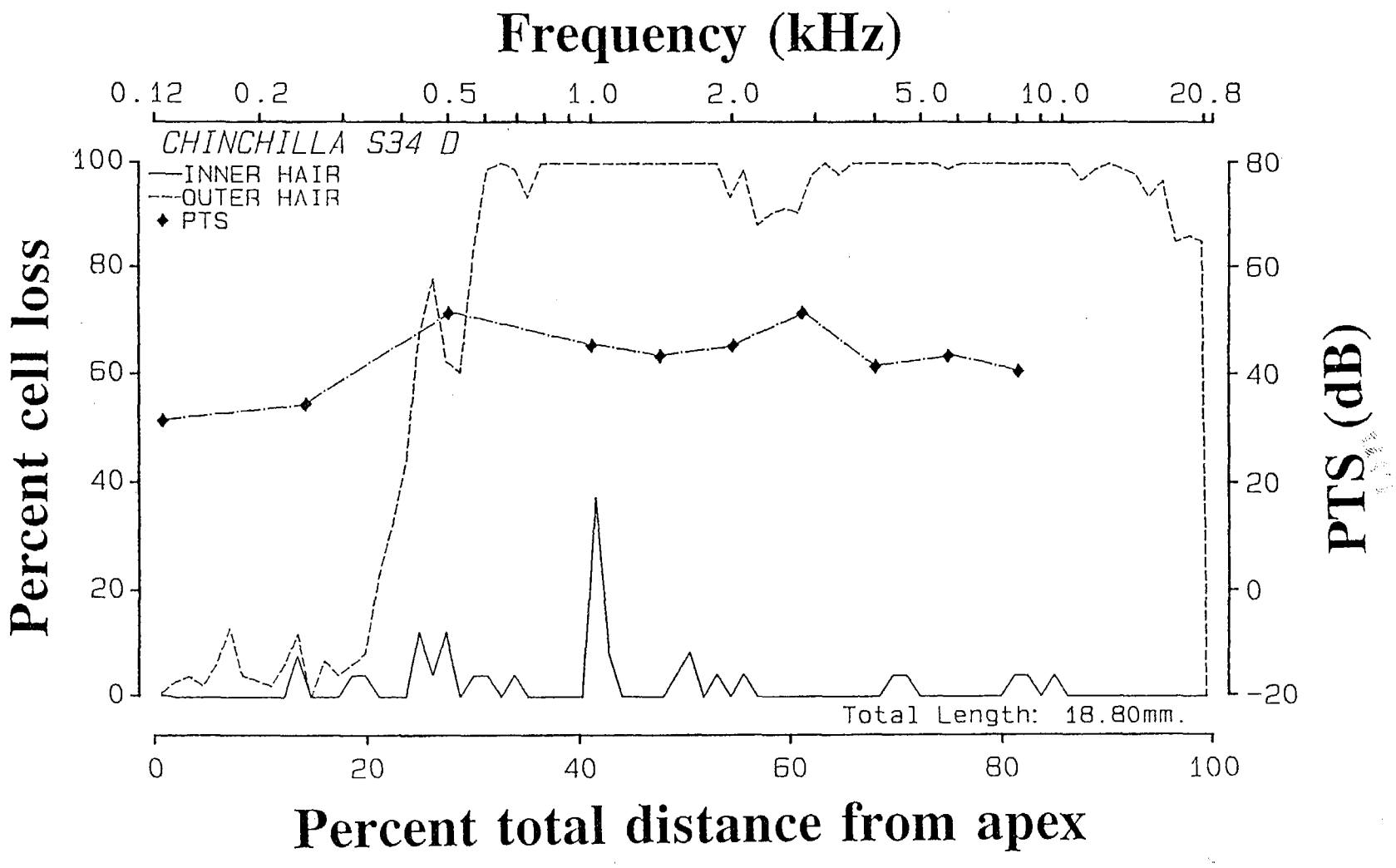

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P19 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.78mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S33 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.24mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S31 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.41mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S27 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.99mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S15 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.58mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S34 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.80mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1025 Hz center frequency, 129 dB peak SPL

Animal #		
T064	-	Completed the entire protocol
T086	-	Completed the entire protocol
T089	-	Completed the entire protocol
T112	-	Completed the entire protocol
T114	-	Completed the entire protocol
T126	-	Completed the entire protocol

1025 Hz center frequency, 129 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T064	17.0	4.0	0.0	4.0	-1.0	3.0	5.0	3.0	2.0	9.0
T086	26.0	7.0	3.0	3.0	2.0	-2.0	-4.0	-2.0	1.0	6.0
T089	20.0	6.0	-3.0	3.0	-2.0	0.0	0.0	0.0	1.0	6.0
T112	20.0	7.0	3.0	1.0	0.0	2.0	4.0	2.0	3.0	4.0
T114	19.0	2.0	0.0	-2.0	1.0	1.0	1.0	1.0	0.0	5.0
T126	25.0	6.0	4.0	2.0	1.0	1.0	1.0	1.0	0.0	3.0
Mean	21.2	5.3	1.2	1.8	0.2	0.8	1.2	0.8	1.2	5.5
S.D.	3.5	2.0	2.6	2.1	1.5	1.7	3.2	1.7	1.2	2.1

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T064	27.8	8.8	-0.4	0.8	3.8	2.6	-0.2	9.8	2.8	11.8
T086	23.0	4.0	0.0	0.0	-1.0	-1.0	3.0	1.0	2.0	7.0
T089	24.6	7.6	5.6	7.6	2.6	2.6	8.6	8.6	1.6	9.6
T112	24.0	13.0	1.0	3.0	2.0	2.0	2.0	2.0	1.0	12.0
T114	19.0	6.0	0.0	0.0	-3.0	-3.0	-1.0	1.0	2.0	3.0
T126	24.0	5.0	7.0	3.0	6.0	0.0	2.0	0.0	3.0	2.0
Mean	23.7	7.4	2.2	2.4	1.7	0.5	2.4	3.7	2.1	7.6
S.D.	2.8	3.2	3.2	2.9	3.3	2.3	3.4	4.3	0.7	4.3

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T064	10.8	4.8	-0.4	-3.2	4.8	-0.4	-5.2	6.8	0.8	2.8
T086	-3.0	-3.0	-3.0	-3.0	-3.0	1.0	7.0	3.0	1.0	1.0
T089	4.6	1.6	8.6	4.6	4.6	2.6	8.6	8.6	0.6	3.6
T112	4.0	6.0	-2.0	2.0	2.0	0.0	-2.0	0.0	-2.0	8.0
T114	0.0	4.0	0.0	2.0	-4.0	-4.0	-2.0	0.0	2.0	-2.0
T126	-1.0	-1.0	3.0	1.0	5.0	-1.0	1.0	-1.0	3.0	-1.0
Mean	2.6	2.1	1.0	0.6	1.6	-0.3	1.2	2.9	0.9	2.1
S.D.	5.0	3.5	4.2	3.1	4.1	2.2	5.5	4.0	1.7	3.6

Temporary Threshold Shift (dB): 1025 Hz center frequency, 129 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	47.0	46.0	45.0	14.0	3.0	22.0	1.0	0.0	9.0	8.0	17.0	6.0	8.0	17.0	6.0	47.0
T086	3.0	12.0	1.0	0.0	-11.0	-2.0	-3.0	-4.0	-5.0	-6.0	-7.0	-8.0	1.0	0.0	-1.0	12.0
T089	3.0	13.0	11.0	18.0	27.0	16.0	5.0	4.0	11.0	12.0	1.0	7.0	6.0	5.0	4.0	27.0
T112	8.0	-3.0	-4.0	5.0	-6.0	3.0	2.0	1.0	-10.0	-1.0	8.0	-3.0	6.0	5.0	4.0	8.0
T114	20.0	-1.0	8.0	7.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	9.0	-2.0	-3.0	-4.0	20.0
T126	-3.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	4.0	3.0	4.0
Mean	13.0	10.5	9.3	8.0	2.0	6.0	1.7	0.7	1.0	2.0	2.7	1.2	2.3	4.7	2.0	19.7
S.D.	18.4	18.9	18.6	6.7	13.4	10.6	2.8	2.8	8.1	6.7	8.6	7.0	5.2	6.8	3.7	15.8

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	61.0	60.0	59.0	38.0	27.0	36.0	5.0	4.0	13.0	2.0	11.0	0.0	2.0	11.0	0.0	61.0
T086	3.0	2.0	1.0	10.0	-1.0	-2.0	-3.0	6.0	5.0	4.0	3.0	2.0	1.0	-10.0	-11.0	10.0
T089	8.0	28.0	16.0	13.0	12.0	31.0	10.0	-1.0	6.0	7.0	-4.0	2.0	1.0	10.0	-1.0	31.0
T112	12.0	11.0	0.0	-1.0	-2.0	7.0	6.0	-5.0	4.0	3.0	2.0	1.0	10.0	9.0	8.0	12.0
T114	28.0	7.0	6.0	5.0	-6.0	3.0	2.0	1.0	10.0	9.0	-2.0	7.0	6.0	5.0	4.0	28.0
T126	17.0	-4.0	-5.0	-6.0	-7.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	4.0	3.0	17.0
Mean	21.5	17.3	12.8	9.8	3.8	12.8	3.5	0.8	6.2	3.8	1.2	1.3	2.5	4.8	0.5	26.5
S.D.	21.1	23.5	23.7	15.5	13.2	16.3	4.5	3.9	4.9	3.9	5.6	3.6	5.1	7.8	6.5	18.9

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	69.0	38.0	37.0	6.0	45.0	14.0	13.0	2.0	1.0	0.0	-1.0	2.0	0.0	-1.0	-2.0	69.0
T086	21.0	10.0	-1.0	8.0	-3.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0	-11.0	-2.0	-3.0	21.0
T089	31.0	11.0	19.0	16.0	45.0	34.0	13.0	42.0	19.0	10.0	9.0	15.0	14.0	3.0	2.0	45.0
T112	30.0	9.0	8.0	7.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	30.0
T114	14.0	13.0	12.0	11.0	0.0	-1.0	-2.0	-3.0	6.0	5.0	4.0	3.0	2.0	1.0	-10.0	14.0
T126	23.0	2.0	1.0	0.0	-1.0	-2.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0	9.0	23.0
Mean	31.3	13.8	12.7	8.0	13.7	7.7	6.7	9.0	6.0	3.7	2.7	3.5	0.7	-0.3	-1.3	33.7
S.D.	19.5	12.4	14.0	5.3	24.3	14.6	5.8	16.4	6.6	3.6	3.6	5.8	8.0	2.2	6.4	20.3

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	47.0	56.0	35.0	4.0	3.0	12.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-2.0	-3.0	-4.0	56.0
T086	33.0	12.0	11.0	0.0	9.0	-2.0	-3.0	-4.0	-5.0	4.0	-7.0	-8.0	1.0	0.0	-1.0	33.0
T089	17.0	17.0	5.0	22.0	31.0	20.0	-1.0	18.0	15.0	16.0	15.0	11.0	0.0	-1.0	-2.0	31.0
T112	24.0	23.0	22.0	1.0	0.0	-1.0	8.0	-3.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0	24.0
T114	28.0	7.0	26.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	8.0	-3.0	-4.0	5.0	4.0	28.0
T126	17.0	6.0	5.0	-6.0	3.0	2.0	1.0	0.0	-1.0	8.0	-3.0	-4.0	5.0	4.0	3.0	17.0
Mean	27.7	20.2	17.3	4.3	8.3	5.7	1.3	2.0	2.3	5.0	2.3	-0.8	0.3	1.0	0.0	31.5
S.D.	11.3	18.7	12.3	9.5	11.5	8.6	3.7	8.1	7.2	6.6	8.2	6.8	3.1	3.0	3.0	13.3

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	81.0	40.0	49.0	38.0	17.0	26.0	25.0	14.0	3.0	2.0	1.0	10.0	2.0	1.0	10.0	81.0
T086	33.0	22.0	1.0	0.0	-1.0	-2.0	7.0	-4.0	5.0	4.0	-7.0	2.0	-9.0	0.0	-1.0	33.0
T089	11.0	41.0	-1.0	16.0	25.0	14.0	3.0	22.0	19.0	20.0	9.0	5.0	4.0	3.0	2.0	41.0
T112	44.0	3.0	12.0	11.0	10.0	-1.0	8.0	7.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	44.0
T114	24.0	13.0	22.0	1.0	10.0	-1.0	-2.0	-3.0	-4.0	5.0	-6.0	-7.0	-8.0	1.0	0.0	24.0
T126	7.0	6.0	5.0	4.0	3.0	2.0	11.0	10.0	9.0	-2.0	7.0	6.0	5.0	4.0	3.0	11.0
Mean	33.3	20.8	14.7	11.7	10.7	6.3	8.7	7.7	4.7	5.7	1.3	3.2	-0.7	1.7	2.3	39.0
S.D.	27.1	16.6	18.8	14.3	9.4	11.3	9.2	10.0	8.7	7.5	6.7	5.7	6.2	1.5	4.0	23.8

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	27.0	36.0	55.0	4.0	43.0	32.0	21.0	0.0	-1.0	-2.0	-3.0	0.0	-2.0	-3.0	6.0	55.0
T086	17.0	26.0	5.0	24.0	3.0	2.0	1.0	0.0	9.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	26.0
T089	19.0	9.0	7.0	24.0	13.0	22.0	1.0	20.0	17.0	8.0	7.0	3.0	2.0	1.0	0.0	24.0
T112	42.0	1.0	0.0	29.0	18.0	17.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	42.0
T114	14.0	3.0	2.0	11.0	0.0	-11.0	-2.0	-3.0	-4.0	-5.0	-6.0	-7.0	-8.0	1.0	0.0	14.0
T126	17.0	-4.0	-5.0	-6.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	4.0	3.0	17.0
Mean	22.7	11.8	10.7	14.3	13.3	10.7	3.0	2.0	4.0	0.0	-1.0	-1.8	-1.3	1.0	1.7	29.7
S.D.	10.4	15.7	22.1	13.7	16.1	15.8	9.1	9.1	7.8	4.7	4.7	3.8	4.7	2.8	2.9	15.8

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	55.0	54.0	63.0	52.0	11.0	20.0	-1.0	-2.0	7.0	-4.0	-5.0	-6.0	-4.0	-5.0	-6.0	63.0
T086	9.0	8.0	7.0	16.0	15.0	4.0	3.0	2.0	1.0	0.0	9.0	8.0	7.0	6.0	5.0	16.0
T089	39.0	19.0	17.0	24.0	33.0	22.0	21.0	20.0	17.0	8.0	7.0	23.0	12.0	1.0	0.0	39.0
T112	40.0	9.0	8.0	27.0	-4.0	15.0	4.0	-7.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	40.0
T114	24.0	3.0	2.0	11.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-7.0	2.0	1.0	0.0	24.0
T126	17.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	6.0	-5.0	4.0	3.0	17.0
Mean	30.7	14.8	17.0	22.3	9.7	10.3	4.3	1.7	3.7	-0.3	0.3	3.8	1.7	0.7	-0.3	33.2
S.D.	17.0	20.6	23.1	16.8	13.4	9.9	8.5	9.5	7.5	4.7	6.3	11.2	6.7	4.1	4.1	18.0

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	67.0	66.0	65.0	34.0	3.0	12.0	11.0	10.0	9.0	8.0	7.0	6.0	8.0	7.0	6.0	67.0
T086	17.0	16.0	15.0	4.0	13.0	2.0	11.0	10.0	9.0	8.0	7.0	6.0	-5.0	4.0	3.0	17.0
T089	5.0	19.0	17.0	14.0	13.0	42.0	21.0	0.0	17.0	18.0	-3.0	13.0	2.0	11.0	20.0	42.0
T112	32.0	11.0	0.0	9.0	-2.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	32.0
T114	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	4.0	3.0	2.0	1.0	-10.0	4.0
T126	17.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	4.0	3.0	17.0
Mean	23.7	18.5	17.3	11.0	5.0	10.7	8.0	3.7	5.7	5.0	2.3	4.2	0.3	4.3	3.3	29.8
S.D.	23.5	24.8	24.4	12.2	6.5	16.0	8.3	5.5	7.6	8.3	4.6	5.7	4.9	4.3	9.9	22.5

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	67.0	66.0	55.0	54.0	3.0	2.0	1.0	0.0	-1.0	-2.0	7.0	-4.0	-2.0	7.0	-4.0	67.0
T086	3.0	2.0	11.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	3.0	2.0	1.0	0.0	-1.0	11.0
T089	17.0	7.0	5.0	42.0	21.0	20.0	19.0	18.0	15.0	16.0	5.0	1.0	0.0	-1.0	-2.0	42.0
T112	50.0	39.0	38.0	7.0	-4.0	-5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	50.0
T114	4.0	3.0	12.0	11.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	12.0
T126	17.0	6.0	5.0	4.0	3.0	12.0	1.0	0.0	9.0	-2.0	-3.0	6.0	5.0	4.0	3.0	17.0
Mean	26.3	20.5	21.0	19.7	3.7	4.3	3.3	2.3	2.7	2.0	2.7	1.2	0.7	1.3	-1.3	33.2
S.D.	26.2	26.3	20.7	22.6	8.9	9.6	8.1	8.1	7.9	7.8	3.6	3.4	2.7	3.6	2.7	23.3

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T064	45.0	44.0	53.0	32.0	1.0	0.0	9.0	-2.0	-3.0	-4.0	5.0	4.0	-4.0	5.0	4.0	53.0
T086	3.0	2.0	11.0	0.0	-11.0	-2.0	-3.0	-4.0	-5.0	-6.0	3.0	2.0	1.0	0.0	-1.0	11.0
T089	-3.0	27.0	5.0	12.0	31.0	30.0	29.0	28.0	5.0	6.0	5.0	1.0	5.0	9.0	-2.0	31.0
T112	34.0	23.0	2.0	11.0	10.0	-1.0	8.0	-3.0	6.0	5.0	14.0	3.0	12.0	11.0	0.0	34.0
T114	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	3.0	2.0	1.0	-10.0	4.0
T126	9.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	-8.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	9.0
Mean	15.3	16.2	11.7	8.7	6.0	5.0	7.3	1.3	0.0	-0.7	3.3	1.8	2.2	3.7	-0.7	23.7
S.D.	19.4	18.1	20.8	13.1	14.1	12.4	11.7	13.2	4.7	5.2	6.7	2.1	5.8	5.7	5.3	18.9

1025 Hz center frequency, 129 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
T064	17	29	49	98	176
T086	14	86	83	114	283
T089	6	25	32	40	97
T112	3	57	82	113	252
T114	13	123	62	90	275
T126	3	42	34	75	151
Group mean	9				206
S.D.	6				76
S.E.	2				31

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	0.8	42.2
	0.25 kHz	1.3	28.0
	0.5 kHz	1.0	21.8
	1 kHz	1.2	38.8
	2 kHz	0.8	20.0
	4 kHz	2.7	31.2
	8 kHz	1.3	8.8
	16 kHz	0.2	14.8
Standard deviations			
	0.125 kHz	1.0	30.0
	0.25 kHz	1.0	11.3
	0.5 kHz	1.1	11.2
	1 kHz	1.6	37.9
	2 kHz	1.0	9.6
	4 kHz	3.4	31.9
	8 kHz	3.3	6.2
	16 kHz	0.4	16.6

1025 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T064							
0.125 kHz	0	0	7	20	27	0	2
0.25 kHz	1	0	4	19	23	0	0
0.5 kHz	3	2	4	9	15	0	0
1 kHz	2	4	8	2	14	0	0
2 kHz	2	5	4	12	21	0	0
4 kHz	1	3	0	5	8	0	0
8 kHz	8	7	5	8	20	2	1
16 kHz	0	8	17	23	48	0	0
TOTALS	17	29	49	98	176	2	3
Chinchilla T086							
0.125 kHz	1	21	32	45	98	0	0
0.25 kHz	3	2	6	19	27	0	1
0.5 kHz	1	8	6	7	21	2	3
1 kHz	0	10	2	8	20	0	0
2 kHz	0	5	2	5	12	0	0
4 kHz	9	34	32	28	94	14	8
8 kHz	0	1	3	1	5	0	0
16 kHz	0	5	0	1	6	0	0
TOTALS	14	86	83	114	283	16	12
Chinchilla T089							
0.125 kHz	0	1	6	5	12	0	0
0.25 kHz	0	5	2	12	19	0	1
0.5 kHz	1	0	10	6	16	0	0
1 kHz	0	5	6	7	18	0	0
2 kHz	0	4	1	3	8	0	0
4 kHz	4	5	3	2	10	0	0
8 kHz	0	0	1	2	3	0	0
16 kHz	1	5	3	3	11	0	0
TOTALS	6	25	32	40	97	0	1

1025 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T112							
0.125 kHz	0	3	14	33	50	0	0
0.25 kHz	1	7	2	38	47	0	0
0.5 kHz	0	5	26	13	44	0	0
1 kHz	1	15	19	11	45	4	0
2 kHz	1	14	15	6	35	1	2
4 kHz	0	10	5	7	22	0	0
8 kHz	0	2	1	3	6	0	0
16 kHz	0	1	0	2	3	0	0
TOTALS	3	57	82	113	252	5	2
Chinchilla T114							
0.125 kHz	2	5	8	22	35	0	0
0.25 kHz	2	21	2	12	35	0	0
0.5 kHz	1	10	4	6	20	0	0
1 kHz	4	61	27	25	113	15	6
2 kHz	2	10	3	6	19	0	0
4 kHz	2	11	10	9	30	0	0
8 kHz	0	2	4	6	12	0	0
16 kHz	0	3	4	4	11	0	0
TOTALS	13	123	62	90	275	15	6
Chinchilla T126							
0.125 kHz	2	4	9	18	31	0	0
0.25 kHz	1	4	1	12	17	0	1
0.5 kHz	0	6	4	5	15	1	0
1 kHz	0	7	6	10	23	0	0
2 kHz	0	14	4	7	25	0	0
4 kHz	0	4	4	15	23	0	0
8 kHz	0	0	2	5	7	0	0
16 kHz	0	3	4	3	10	0	0
TOTALS	3	42	34	75	151	1	1

1025 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	0.8	5.7	12.7	23.8	42.2	0.0	0.3
0.25 kHz	1.3	6.5	2.8	18.7	28.0	0.0	0.5
0.5 kHz	1.0	5.2	9.0	7.7	21.8	0.5	0.5
1 kHz	1.2	17.0	11.3	10.5	38.8	3.2	1.0
2 kHz	0.8	8.7	4.8	6.5	20.0	0.2	0.3
4 kHz	2.7	11.2	9.0	11.0	31.2	2.3	1.3
8 kHz	1.3	2.0	2.7	4.2	8.8	0.3	0.2
16 kHz	0.2	4.2	4.7	6.0	14.8	0.0	0.0
TOTALS	9.3	60.3	57.0	88.3	205.7	6.5	4.2
Group standard deviations							
0.125 kHz	1.0	7.7	9.9	13.7	30.0	0.0	0.8
0.25 kHz	1.0	7.5	1.8	10.1	11.3	0.0	0.5
0.5 kHz	1.1	3.7	8.6	2.9	11.2	0.8	1.2
1 kHz	1.6	21.9	9.6	7.8	37.9	6.0	2.4
2 kHz	1.0	4.6	5.1	3.0	9.6	0.4	0.8
4 kHz	3.4	11.7	11.7	9.4	31.9	5.7	3.3
8 kHz	3.3	2.6	1.6	2.6	6.2	0.8	0.4
16 kHz	0.4	2.4	6.3	8.4	16.6	0.0	0.0
TOTALS	6.1	37.9	22.6	27.8	75.6	7.2	4.3

1025 Hz center frequency, 129 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T064							
0.125 kHz	0.0	0.0	3.7	10.8	4.8	0.0	1.0
0.25 kHz	0.4	0.0	1.2	5.8	2.3	0.0	0.0
0.5 kHz	1.2	0.6	1.2	2.7	1.5	0.0	0.0
1 kHz	0.8	1.2	2.5	0.6	1.4	0.0	0.0
2 kHz	0.8	1.5	1.2	3.8	2.2	0.0	0.0
4 kHz	0.3	0.9	0.0	1.5	0.8	0.0	0.0
8 kHz	3.1	2.2	1.5	2.5	2.1	0.3	0.3
16 kHz	0.0	2.6	5.5	7.4	5.2	0.0	0.0
Chinchilla T086							
0.125 kHz	0.6	10.7	16.4	23.0	16.7	0.0	0.0
0.25 kHz	1.1	0.5	1.7	5.5	2.6	0.0	0.2
0.5 kHz	0.3	2.3	1.7	2.0	2.0	0.3	0.8
1 kHz	0.0	3.0	0.6	2.4	2.0	0.0	0.0
2 kHz	0.0	1.5	0.6	1.5	1.2	0.0	0.0
4 kHz	3.4	10.2	9.6	8.4	9.4	2.6	2.4
8 kHz	0.0	0.3	0.9	0.3	0.5	0.0	0.0
16 kHz	0.0	1.5	0.0	0.3	0.6	0.0	0.0
Chinchilla T089							
0.125 kHz	0.0	0.5	3.2	2.6	2.1	0.0	0.0
0.25 kHz	0.0	1.5	0.6	3.6	1.9	0.0	0.3
0.5 kHz	0.4	0.0	3.0	1.8	1.6	0.0	0.0
1 kHz	0.0	1.6	1.9	2.2	1.9	0.0	0.0
2 kHz	0.0	1.2	0.3	0.9	0.8	0.0	0.0
4 kHz	1.5	1.5	0.9	0.6	1.0	0.0	0.0
8 kHz	0.0	0.0	0.3	0.6	0.3	0.0	0.0
16 kHz	0.4	1.7	1.0	1.0	1.2	0.0	0.0

1025 Hz center frequency, 129 dB peak SPL

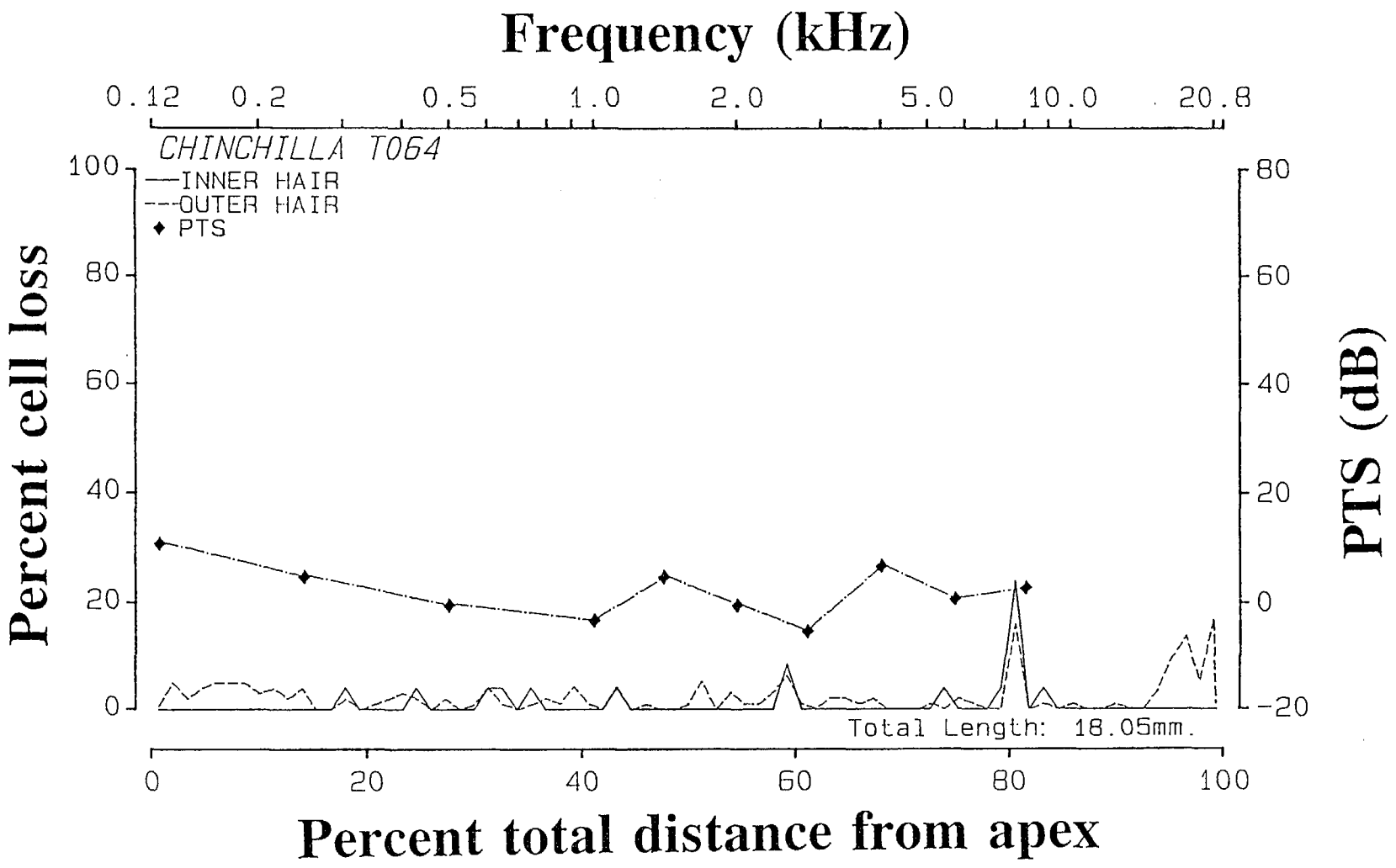
Percent sensory cell losses over octave band frequencies

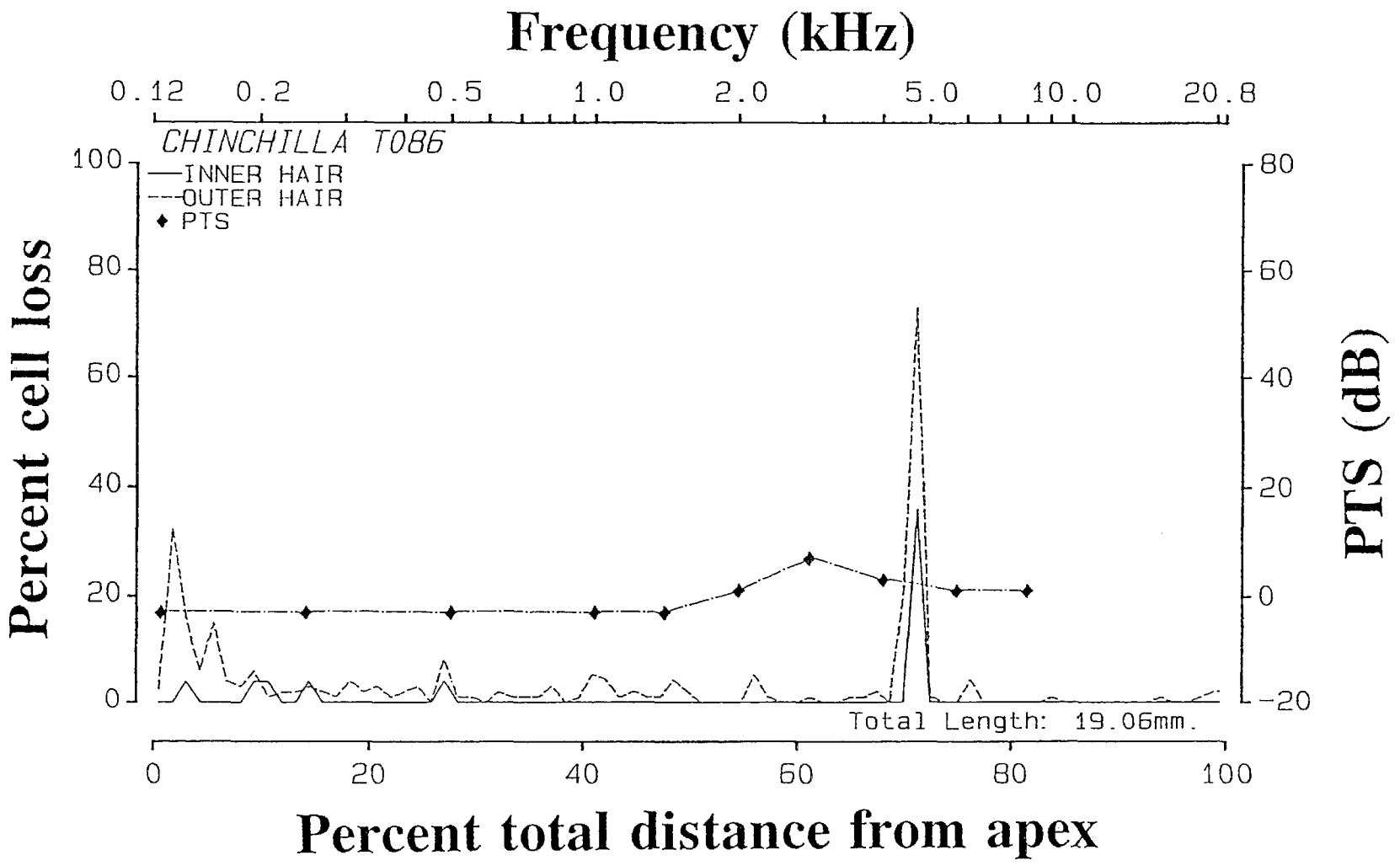
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T112							
0.125 kHz	0.0	1.5	7.4	17.4	8.8	0.0	0.0
0.25 kHz	0.4	2.1	0.6	11.4	4.7	0.0	0.0
0.5 kHz	0.0	1.5	7.9	3.9	4.4	0.0	0.0
1 kHz	0.4	4.7	6.0	3.4	4.7	0.7	0.0
2 kHz	0.4	4.3	4.6	1.8	3.6	0.1	0.6
4 kHz	0.0	3.1	1.5	2.1	2.2	0.0	0.0
8 kHz	0.0	0.6	0.3	0.9	0.6	0.0	0.0
16 kHz	0.0	0.3	0.0	0.6	0.3	0.0	0.0
Chinchilla T114							
0.125 kHz	1.5	2.8	4.5	12.5	6.6	0.0	0.0
0.25 kHz	0.8	6.8	0.6	3.8	3.7	0.0	0.0
0.5 kHz	0.4	3.2	1.3	1.9	2.1	0.0	0.0
1 kHz	1.7	20.8	9.2	8.5	12.8	3.1	2.0
2 kHz	0.8	3.3	1.0	2.0	2.1	0.0	0.0
4 kHz	0.8	3.6	3.3	3.0	3.3	0.0	0.0
8 kHz	0.0	0.6	1.3	2.0	1.3	0.0	0.0
16 kHz	0.0	1.0	1.3	1.3	1.2	0.0	0.0
Chinchilla T126							
0.125 kHz	1.4	2.1	4.8	9.7	5.5	0.0	0.0
0.25 kHz	0.4	1.2	0.3	3.7	1.7	0.0	0.3
0.5 kHz	0.0	1.8	1.2	1.5	1.5	0.1	0.0
1 kHz	0.0	2.2	1.9	3.2	2.4	0.0	0.0
2 kHz	0.0	4.4	1.2	2.2	2.6	0.0	0.0
4 kHz	0.0	1.2	1.2	4.7	2.4	0.0	0.0
8 kHz	0.0	0.0	0.6	1.5	0.7	0.0	0.0
16 kHz	0.0	0.9	1.3	0.9	1.0	0.0	0.0

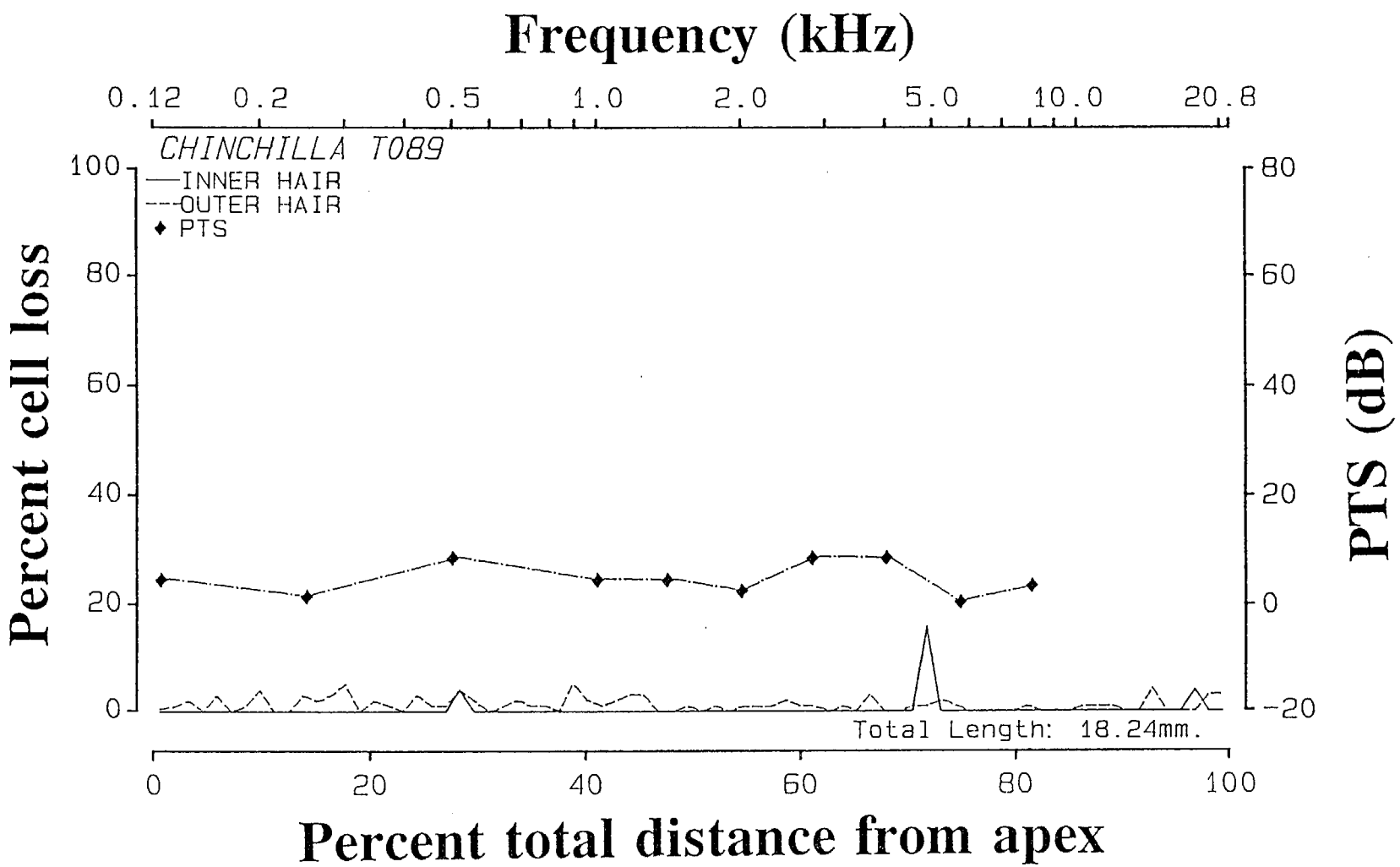
1025 Hz center frequency, 129 dB peak SPL

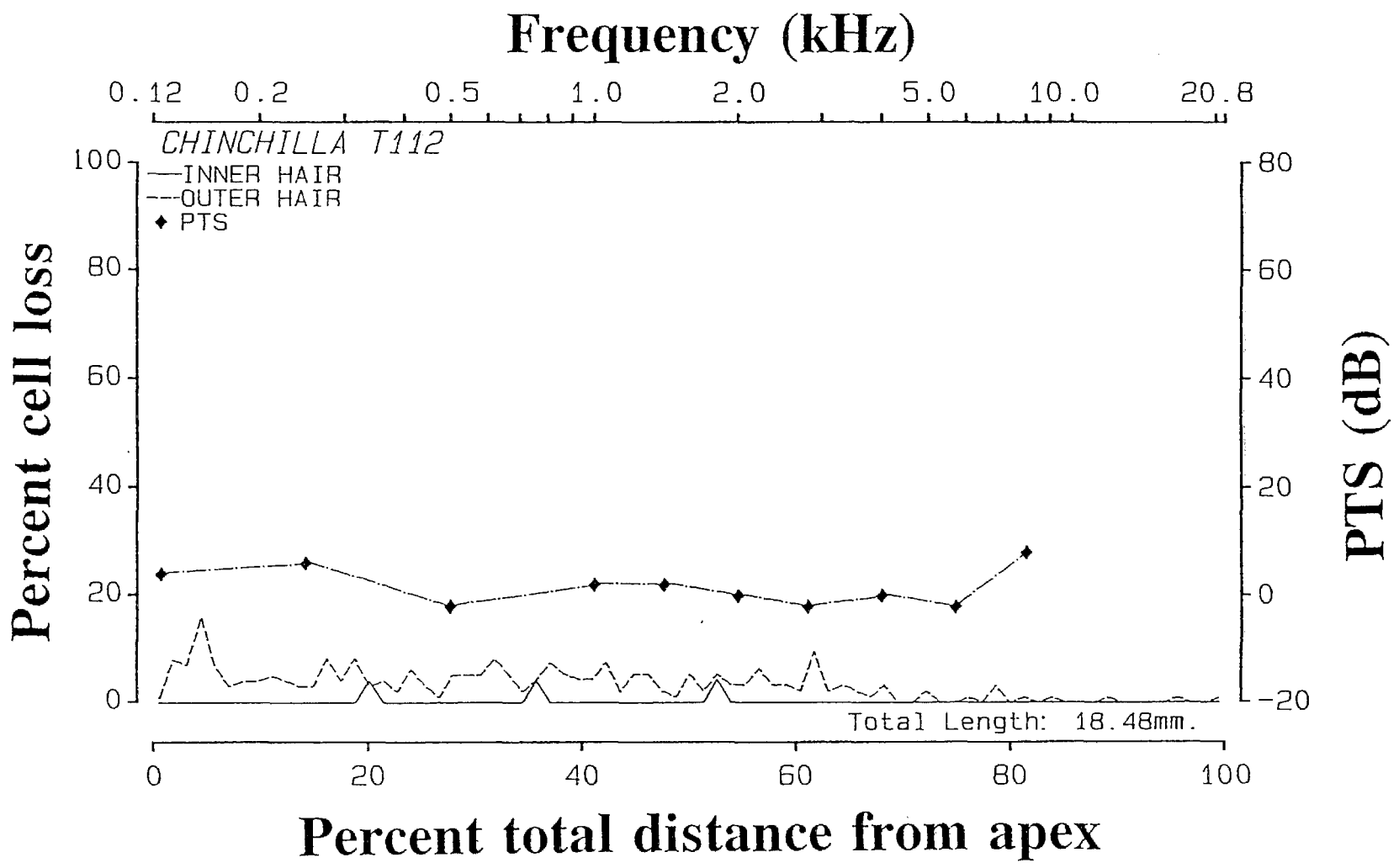
Percent sensory cell losses over octave band frequencies

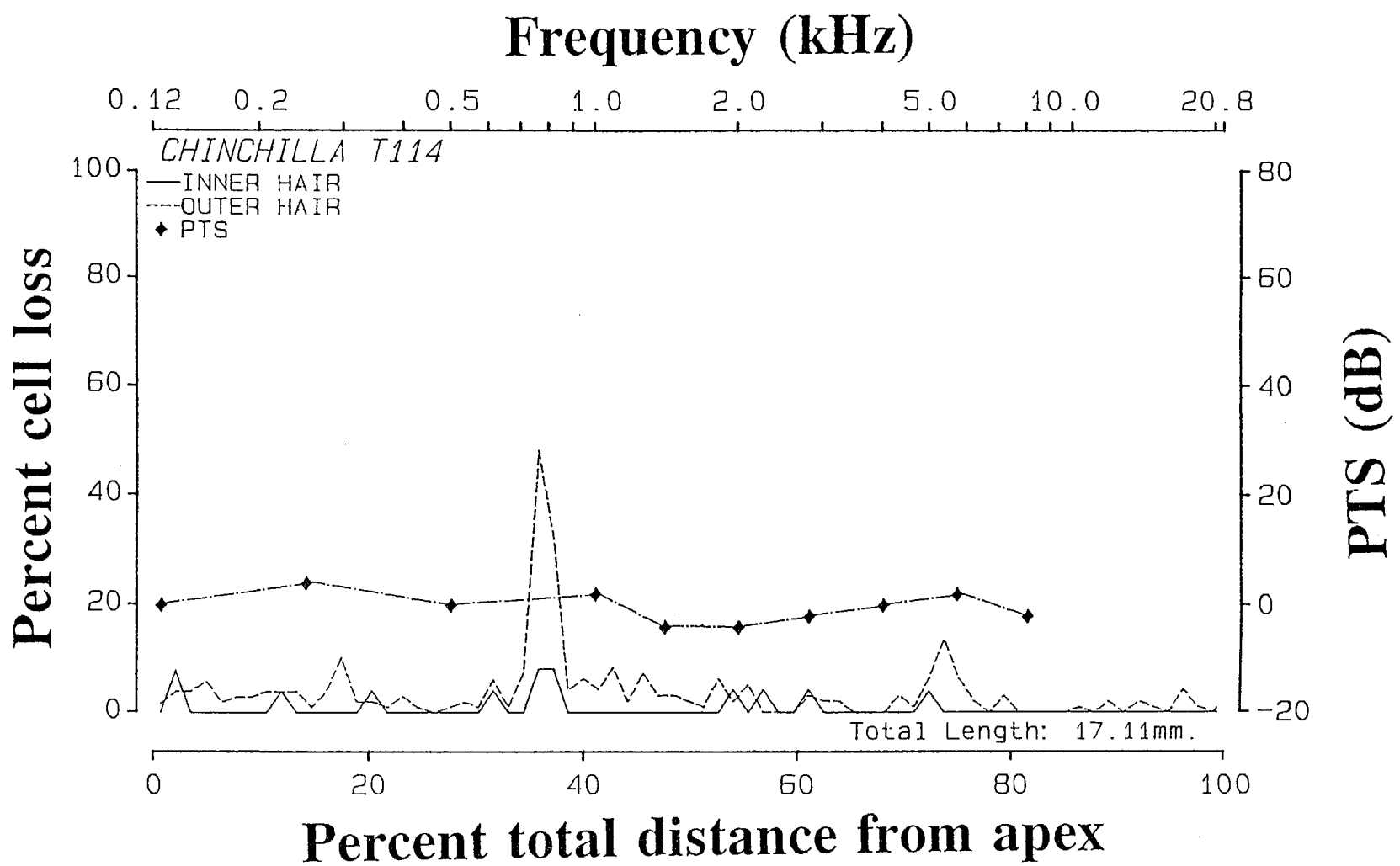
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	0.58	2.93	6.67	12.67	7.42	0.00	0.17
0.25 kHz	0.52	2.02	0.83	5.63	2.83	0.00	0.13
0.5 kHz	0.38	1.57	2.72	2.30	2.19	0.07	0.13
1 kHz	0.48	5.58	3.68	3.38	4.22	0.63	0.33
2 kHz	0.33	2.70	1.48	2.03	2.07	0.02	0.10
4 kHz	1.00	3.42	2.75	3.38	3.18	0.43	0.40
8 kHz	0.52	0.62	0.82	1.30	0.91	0.05	0.05
16 kHz	0.07	1.33	1.52	1.92	1.59	0.00	0.00
Group standard deviations							
0.125 kHz	0.71	3.94	4.99	6.97	5.04	0.00	0.41
0.25 kHz	0.38	2.46	0.52	2.98	1.16	0.00	0.15
0.5 kHz	0.44	1.15	2.63	0.88	1.13	0.12	0.33
1 kHz	0.68	7.56	3.26	2.70	4.37	1.24	0.82
2 kHz	0.39	1.48	1.57	0.98	0.99	0.04	0.24
4 kHz	1.31	3.49	3.53	2.83	3.18	1.06	0.98
8 kHz	1.27	0.82	0.51	0.85	0.66	0.12	0.12
16 kHz	0.16	0.79	2.04	2.71	1.79	0.00	0.00

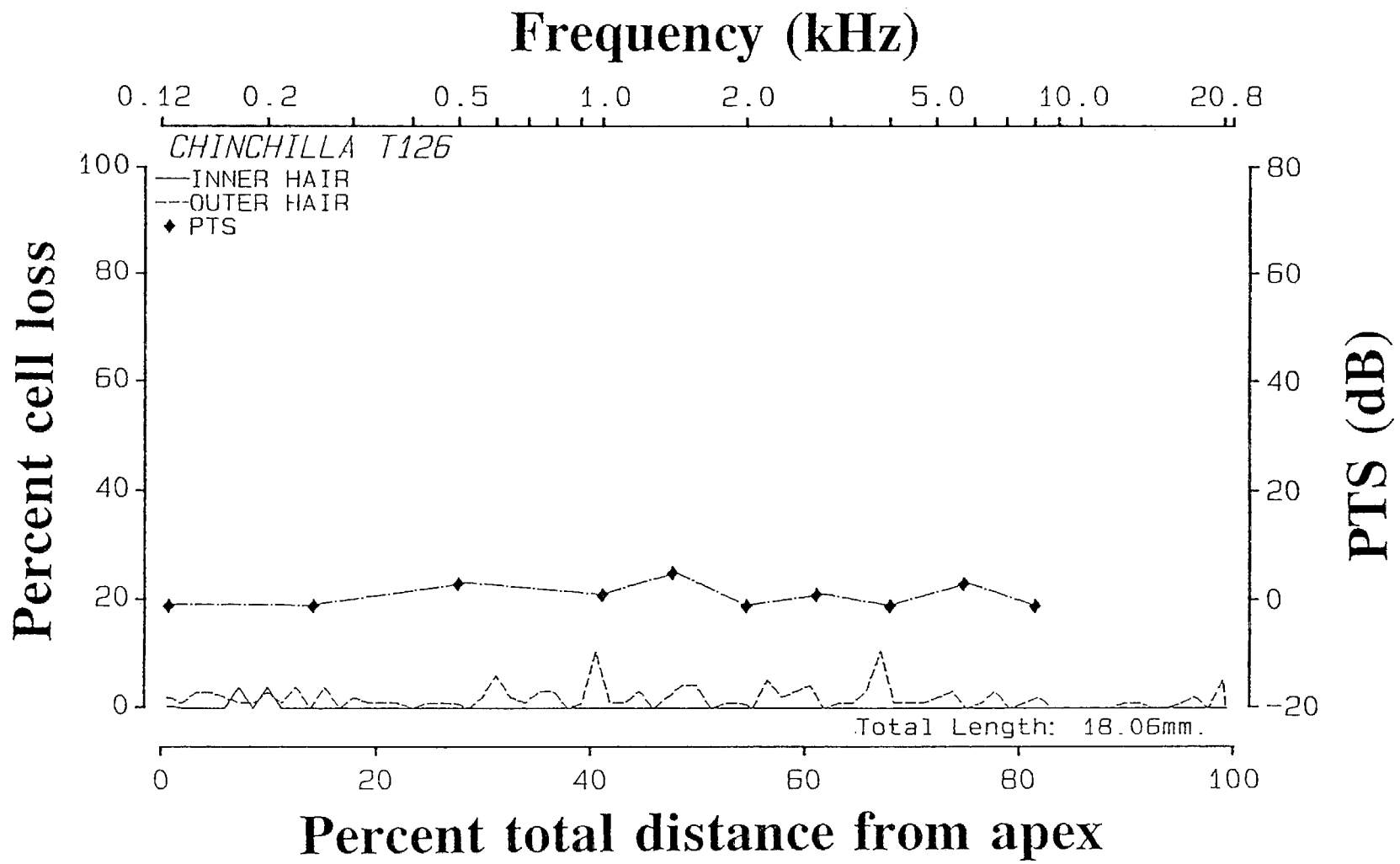

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T064
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.05mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T086
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.06mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T089
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.24mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T112
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.48mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T114
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.11mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T126
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.06mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1025 Hz center frequency, 134 dB peak SPL

Animal #		
M086	-	Completed the entire protocol
N13	-	Completed the entire protocol
N16	-	Completed the entire protocol
N33	-	Completed the entire protocol
N78	-	Completed the entire protocol
P01	-	Completed the entire protocol

1025 Hz center frequency, 134 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M086	24.0	9.0	1.0	1.0	2.0	0.0	-4.0	0.0	1.0	6.0
N13	24.0	3.0	7.0	1.0	2.0	2.0	0.0	6.0	1.0	2.0
N16	23.0	4.0	-2.0	-2.0	1.0	-11.0	1.0	1.0	4.0	3.0
N33	24.0	5.0	5.0	1.0	6.0	2.0	0.0	0.0	3.0	2.0
N78	22.0	5.0	1.0	3.0	2.0	0.0	2.0	0.0	1.0	4.0
P01	22.0	5.0	1.0	1.0	2.0	0.0	4.0	0.0	3.0	2.0
Mean	23.2	5.2	2.2	0.8	2.5	-1.2	0.5	1.2	2.2	3.2
S.D.	1.0	2.0	3.3	1.6	1.8	4.9	2.7	2.4	1.3	1.6

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M086	29.0	10.0	4.0	15.4	15.0	5.0	3.0	1.0	2.0	-1.0
N13	52.0	37.0	31.0	25.0	28.0	14.0	16.0	12.0	17.0	14.0
N16	46.8	35.8	29.8	29.8	20.8	22.8	8.8	-3.2	-2.2	6.8
N33	24.0	5.0	7.0	3.0	4.0	0.0	4.0	0.0	3.0	2.0
N78	26.2	11.2	9.2	7.2	14.2	10.2	12.2	10.2	11.2	10.2
P01	26.4	13.2	15.2	17.2	6.2	8.2	10.2	6.2	9.2	12.2
Mean	34.1	18.7	16.0	16.3	14.7	10.0	9.0	4.4	6.7	7.4
S.D.	12.1	14.0	11.7	10.2	9.0	7.8	4.9	6.1	7.0	5.9

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M086	5.0	1.0	3.0	14.4	13.0	5.0	7.0	1.0	1.0	-7.0
N13	28.0	34.0	24.0	24.0	26.0	12.0	16.0	6.0	16.0	12.0
N16	23.8	31.8	31.8	31.8	19.8	33.8	7.8	-4.2	-6.2	3.8
N33	0.0	0.0	2.0	2.0	-2.0	-2.0	4.0	0.0	0.0	0.0
N78	4.2	6.2	8.2	4.2	12.2	10.2	10.2	10.2	10.2	6.2
P01	4.4	8.2	14.2	16.2	4.2	8.2	6.2	6.2	6.2	10.2
Mean	10.9	13.5	13.9	15.4	12.2	11.2	8.5	3.2	4.5	4.2
S.D.	11.8	15.3	12.0	11.4	10.1	12.1	4.2	5.2	7.9	7.0

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	17.0	26.0	25.0	34.0	43.0	32.0	21.0	20.0	-1.0	8.0	7.0	6.0	5.0	4.0	3.0	43.0
N13	44.0	42.0	50.0	48.0	56.0	34.0	32.0	40.0	18.0	16.0	24.0	32.0	30.0	28.0	26.0	56.0
N16	58.0	56.0	71.0	71.0	60.0	48.0	35.0	43.0	31.0	29.0	27.0	26.0	24.0	22.0	20.0	71.0
N33	20.0	8.0	16.0	14.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	20.0
N78	7.0	26.0	35.0	24.0	23.0	2.0	11.0	0.0	5.0	14.0	3.0	2.0	11.0	3.0	2.0	35.0
P01	47.0	36.0	35.0	24.0	53.0	21.0	10.0	9.0	5.0	-16.0	3.0	2.0	11.0	4.0	2.0	53.0
Mean	32.2	32.3	38.7	35.8	39.5	22.8	17.8	18.0	10.3	8.8	10.7	11.0	12.8	10.8	9.2	46.3
S.D.	20.2	16.4	19.5	20.7	22.6	19.0	14.2	20.0	11.9	15.2	11.7	14.3	12.4	11.1	10.9	17.8

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	33.0	32.0	41.0	50.0	59.0	48.0	37.0	36.0	15.0	4.0	3.0	2.0	1.0	0.0	-1.0	59.0
N13	56.0	54.0	62.0	70.0	78.0	56.0	44.0	52.0	30.0	28.0	36.0	34.0	42.0	30.0	28.0	78.0
N16	68.0	76.0	84.0	91.0	60.0	58.0	45.0	43.0	41.0	29.0	27.0	36.0	34.0	32.0	30.0	91.0
N33	20.0	18.0	26.0	24.0	22.0	10.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	26.0
N78	25.0	24.0	43.0	22.0	1.0	20.0	9.0	8.0	13.0	12.0	11.0	0.0	9.0	1.0	10.0	43.0
P01	55.0	44.0	53.0	42.0	61.0	39.0	18.0	27.0	13.0	12.0	11.0	10.0	9.0	11.0	0.0	61.0
Mean	42.8	41.3	51.5	49.8	46.8	38.5	26.8	28.7	19.3	14.5	14.7	13.3	15.2	13.0	11.5	59.7
S.D.	19.5	21.5	20.0	26.9	29.0	19.6	17.2	18.7	13.5	11.6	14.0	17.3	18.5	14.5	14.1	23.4

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	55.0	44.0	43.0	52.0	71.0	50.0	39.0	28.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	71.0
N13	56.0	54.0	62.0	60.0	58.0	46.0	34.0	32.0	20.0	18.0	26.0	34.0	22.0	20.0	18.0	62.0
N16	68.0	76.0	74.0	82.0	50.0	58.0	45.0	33.0	31.0	29.0	37.0	36.0	24.0	32.0	30.0	82.0
N33	24.0	22.0	20.0	18.0	16.0	14.0	12.0	10.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	6.0	24.0
N78	33.0	42.0	61.0	20.0	29.0	8.0	7.0	6.0	11.0	10.0	9.0	8.0	7.0	9.0	8.0	61.0
P01	53.0	62.0	61.0	60.0	59.0	37.0	26.0	25.0	21.0	20.0	19.0	18.0	7.0	9.0	18.0	62.0
Mean	48.2	50.0	53.5	48.7	47.2	35.5	27.2	22.3	14.7	13.2	16.7	17.0	10.5	11.7	13.5	60.3
S.D.	16.4	18.5	19.2	25.1	20.7	20.2	15.1	11.5	11.7	11.6	13.1	15.0	10.1	12.5	10.5	19.5

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	47.0	46.0	75.0	74.0	73.0	52.0	41.0	40.0	19.0	18.0	14.0	16.0	15.0	14.0	13.0	75.0
N13	54.0	62.0	60.0	88.0	76.0	44.0	32.0	40.0	28.0	26.0	24.0	32.0	20.0	28.0	16.0	88.0
N16	50.0	68.0	76.0	84.0	52.0	50.0	37.0	35.0	33.0	31.0	29.0	28.0	36.0	34.0	32.0	84.0
N33	30.0	28.0	26.0	24.0	22.0	10.0	8.0	16.0	4.0	12.0	10.0	-2.0	-4.0	4.0	2.0	30.0
N78	33.0	12.0	51.0	40.0	19.0	8.0	17.0	6.0	21.0	10.0	9.0	-2.0	7.0	-1.0	8.0	51.0
P01	65.0	44.0	43.0	52.0	61.0	19.0	18.0	27.0	23.0	13.0	11.0	20.0	9.0	21.0	20.0	65.0
Mean	46.5	43.3	55.2	60.3	50.5	30.5	25.5	27.3	21.3	18.3	16.2	15.3	13.8	16.7	15.2	65.5
S.D.	13.2	20.9	19.3	25.8	24.8	20.4	13.0	13.9	9.9	8.4	8.3	14.6	13.6	13.6	10.4	22.0

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	55.0	44.0	63.0	72.0	71.0	60.0	39.0	38.0	17.0	16.0	15.0	14.0	13.0	12.0	11.0	72.0
N13	52.0	50.0	58.0	86.0	74.0	42.0	30.0	48.0	26.0	14.0	22.0	30.0	28.0	26.0	24.0	86.0
N16	46.0	74.0	72.0	70.0	48.0	46.0	33.0	31.0	29.0	27.0	15.0	24.0	22.0	20.0	18.0	74.0
N33	14.0	12.0	10.0	18.0	16.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	18.0
N78	13.0	12.0	61.0	40.0	9.0	8.0	17.0	6.0	11.0	0.0	9.0	8.0	7.0	19.0	18.0	61.0
P01	63.0	42.0	31.0	40.0	59.0	17.0	6.0	34.0	11.0	0.0	9.0	8.0	-3.0	-1.0	8.0	63.0
Mean	40.5	39.0	49.2	54.3	46.2	29.5	21.2	26.2	15.3	8.8	10.7	14.3	11.2	12.3	12.5	62.3
S.D.	21.6	23.8	23.6	25.7	27.8	22.9	15.2	18.9	11.3	12.1	9.5	10.7	12.2	11.6	9.9	23.5

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	37.0	36.0	65.0	74.0	73.0	62.0	41.0	30.0	-1.0	8.0	7.0	6.0	5.0	4.0	3.0	74.0
N13	52.0	70.0	68.0	86.0	74.0	52.0	30.0	48.0	16.0	14.0	22.0	10.0	8.0	16.0	4.0	86.0
N16	68.0	76.0	84.0	82.0	60.0	48.0	45.0	33.0	41.0	39.0	37.0	36.0	34.0	32.0	30.0	84.0
N33	18.0	16.0	24.0	22.0	20.0	-2.0	6.0	14.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	24.0
N78	25.0	24.0	43.0	32.0	41.0	10.0	9.0	-2.0	23.0	22.0	11.0	10.0	9.0	1.0	20.0	43.0
P01	55.0	14.0	33.0	32.0	61.0	19.0	18.0	7.0	13.0	2.0	11.0	10.0	-1.0	11.0	10.0	61.0
Mean	42.5	39.3	52.8	54.7	54.8	31.5	24.8	21.7	15.7	14.2	14.3	11.3	8.2	11.0	11.2	62.0
S.D.	19.1	27.3	23.1	29.0	20.8	25.9	16.4	18.6	15.3	14.6	13.5	13.3	13.9	11.8	11.6	24.5

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	21.0	20.0	49.0	48.0	77.0	46.0	25.0	24.0	3.0	2.0	1.0	10.0	9.0	8.0	7.0	77.0
N13	44.0	42.0	60.0	78.0	76.0	44.0	22.0	40.0	18.0	16.0	14.0	12.0	10.0	28.0	16.0	78.0
N16	56.0	64.0	72.0	60.0	38.0	36.0	23.0	31.0	29.0	17.0	5.0	14.0	2.0	10.0	8.0	72.0
N33	30.0	28.0	26.0	24.0	12.0	0.0	8.0	6.0	4.0	2.0	10.0	-2.0	6.0	4.0	2.0	30.0
N78	33.0	32.0	51.0	30.0	19.0	28.0	17.0	26.0	21.0	10.0	9.0	8.0	7.0	9.0	18.0	51.0
P01	41.0	20.0	29.0	38.0	57.0	15.0	14.0	3.0	9.0	-2.0	17.0	16.0	-5.0	7.0	-4.0	57.0
Mean	37.5	34.3	47.8	46.3	46.5	28.2	18.2	21.7	14.0	7.5	9.3	9.7	4.8	11.0	7.8	60.8
S.D.	12.2	16.7	17.8	20.1	28.0	17.9	6.4	14.4	10.4	8.0	5.8	6.4	5.6	8.6	8.3	18.7

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	7.0	6.0	45.0	44.0	63.0	32.0	11.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	63.0
N13	28.0	36.0	24.0	62.0	70.0	28.0	16.0	24.0	12.0	0.0	8.0	6.0	4.0	12.0	0.0	70.0
N16	26.0	54.0	72.0	60.0	8.0	6.0	13.0	1.0	9.0	7.0	5.0	-6.0	-8.0	0.0	-12.0	72.0
N33	20.0	18.0	26.0	14.0	12.0	10.0	8.0	6.0	4.0	-8.0	0.0	-2.0	-4.0	4.0	2.0	26.0
N78	25.0	34.0	33.0	22.0	21.0	20.0	9.0	8.0	13.0	12.0	11.0	10.0	9.0	11.0	10.0	34.0
P01	35.0	34.0	23.0	32.0	51.0	9.0	8.0	7.0	13.0	22.0	11.0	10.0	-1.0	1.0	10.0	51.0
Mean	23.5	30.3	37.2	39.0	37.5	17.5	10.8	7.7	8.3	5.2	5.3	2.3	0.8	5.3	2.2	52.7
S.D.	9.4	16.5	18.9	19.8	27.1	10.8	3.2	8.6	5.7	10.8	5.8	7.2	6.3	5.1	8.1	19.2

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	-5.0	-6.0	43.0	62.0	61.0	20.0	9.0	-2.0	-3.0	-4.0	5.0	-6.0	3.0	2.0	1.0	62.0
N13	32.0	40.0	28.0	66.0	74.0	32.0	20.0	38.0	16.0	14.0	12.0	20.0	8.0	26.0	14.0	74.0
N16	32.0	60.0	68.0	56.0	24.0	2.0	9.0	27.0	15.0	13.0	1.0	0.0	-12.0	-14.0	-6.0	68.0
N33	16.0	24.0	22.0	20.0	18.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	24.0
N78	23.0	12.0	51.0	40.0	19.0	18.0	7.0	16.0	11.0	20.0	-1.0	18.0	17.0	9.0	8.0	51.0
P01	11.0	10.0	29.0	38.0	37.0	15.0	14.0	13.0	19.0	8.0	7.0	6.0	5.0	7.0	6.0	38.0
Mean	18.2	23.3	40.2	47.0	38.8	13.8	10.5	15.7	9.7	8.2	3.3	7.0	3.8	5.0	3.5	52.8
S.D.	14.1	23.6	17.3	17.5	23.6	13.0	5.7	15.1	9.1	9.5	5.8	10.2	9.4	13.1	7.3	19.1

Temporary Threshold Shift (dB): 1025 Hz center frequency, 134 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M086	5.0	4.0	13.0	52.0	51.0	40.0	9.0	-2.0	-3.0	-4.0	-5.0	-6.0	-7.0	-8.0	-9.0	52.0
N13	46.0	34.0	32.0	60.0	78.0	36.0	14.0	32.0	20.0	8.0	6.0	14.0	12.0	20.0	8.0	78.0
N16	18.0	36.0	74.0	62.0	0.0	8.0	5.0	3.0	11.0	-1.0	7.0	6.0	4.0	2.0	0.0	74.0
N33	12.0	20.0	18.0	16.0	14.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	20.0
N78	25.0	24.0	33.0	32.0	11.0	10.0	-2.0	18.0	13.0	22.0	1.0	20.0	-1.0	11.0	0.0	33.0
P01	17.0	26.0	25.0	34.0	53.0	11.0	10.0	9.0	15.0	4.0	13.0	2.0	11.0	13.0	12.0	53.0
Mean	20.5	24.0	32.5	42.7	34.5	17.8	6.0	11.3	10.3	5.5	4.0	6.0	2.8	5.7	2.5	51.7
S.D.	14.1	11.5	21.8	18.2	30.6	16.0	6.2	12.1	8.0	9.1	6.1	9.6	7.6	10.8	7.3	22.6

1025 Hz center frequency, 134 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
M086	111	270	269	414	953
N13	151	480	432	377	1289
N16	62	888	814	498	2200
N33	49	103	142	144	389
N78	59	394	421	370	1185
P01	2	22	31	29	82
Group mean	72				1016
S.D.	52				745
S.E.	21				304

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.0	75.7
	0.25 kHz	1.2	60.8
	0.5 kHz	1.2	148.0
	1 kHz	52.2	492.3
	2 kHz	6.0	190.8
	4 kHz	5.0	16.5
	8 kHz	4.7	12.7
	16 kHz	1.2	19.5
Standard deviations			
	0.125 kHz	1.3	38.6
	0.25 kHz	1.5	45.4
	0.5 kHz	1.0	149.0
	1 kHz	49.4	330.0
	2 kHz	10.1	302.9
	4 kHz	6.9	9.8
	8 kHz	7.7	13.3
	16 kHz	1.6	10.3

1025 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M086							
0.125 kHz	0	29	23	77	129	0	0
0.25 kHz	3	10	10	95	115	0	0
0.5 kHz	1	21	7	84	112	1	1
1 kHz	64	166	180	135	481	150	107
2 kHz	3	22	32	7	61	1	1
4 kHz	18	9	4	4	17	0	0
8 kHz	20	8	3	8	19	3	0
16 kHz	2	5	10	4	19	0	0
TOTALS	111	270	269	414	953	155	109
Chinchilla N13D							
0.125 kHz	2	7	13	59	79	0	1
0.25 kHz	1	22	34	43	99	0	1
0.5 kHz	2	66	45	4	115	0	0
1 kHz	140	263	253	197	713	289	178
2 kHz	6	105	81	66	252	11	6
4 kHz	0	11	0	5	16	0	0
8 kHz	0	1	3	3	7	0	0
16 kHz	0	5	3	0	8	0	0
TOTALS	151	480	432	377	1289	300	186
Chinchilla N16D							
0.125 kHz	3	11	11	9	31	5	8
0.25 kHz	3	28	29	31	88	1	1
0.5 kHz	2	200	134	37	371	0	0
1 kHz	14	332	331	217	880	32	44
2 kHz	26	294	292	194	780	55	61
4 kHz	6	10	6	2	18	1	1
8 kHz	4	3	2	1	6	0	0
16 kHz	4	10	9	7	26	3	2
TOTALS	62	888	814	498	2200	97	117

1025 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla N33D							
0.125 kHz	0	14	49	46	109	0	0
0.25 kHz	0	2	2	7	11	0	0
0.5 kHz	2	0	3	4	7	0	0
1 kHz	40	70	68	65	203	86	54
2 kHz	0	3	3	2	8	0	0
4 kHz	5	2	5	5	12	1	0
8 kHz	2	2	1	3	6	0	0
16 kHz	0	10	11	12	33	0	0
TOTALS	49	103	142	144	389	87	54
Chinchilla N78D							
0.125 kHz	0	8	12	48	68	0	0
0.25 kHz	0	2	3	33	38	0	0
0.5 kHz	0	110	106	65	281	0	2
1 kHz	55	250	246	170	666	128	109
2 kHz	1	9	17	12	38	0	2
4 kHz	1	6	17	10	33	0	0
8 kHz	2	1	11	25	37	0	0
16 kHz	0	8	9	7	24	0	1
TOTALS	59	394	421	370	1185	128	114
Chinchilla P01D							
0.125 kHz	1	9	17	12	38	0	2
0.25 kHz	0	3	2	9	14	0	0
0.5 kHz	0	2	0	0	2	0	0
1 kHz	0	2	7	2	11	0	0
2 kHz	0	2	2	2	6	0	0
4 kHz	0	0	1	2	3	0	0
8 kHz	0	0	0	1	1	0	0
16 kHz	1	4	2	1	7	0	0
TOTALS	2	22	31	29	82	0	2

1025 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.0	13.0	20.8	41.8	75.7	0.8	1.8
0.25 kHz	1.2	11.2	13.3	36.3	60.8	0.2	0.3
0.5 kHz	1.2	66.5	49.2	32.3	148.0	0.2	0.5
1 kHz	52.2	180.5	180.8	131.0	492.3	114.2	82.0
2 kHz	6.0	72.5	71.2	47.2	190.8	11.2	11.7
4 kHz	5.0	6.3	5.5	4.7	16.5	0.3	0.2
8 kHz	4.7	2.5	3.3	6.8	12.7	0.5	0.0
16 kHz	1.2	7.0	7.3	5.2	19.5	0.5	0.5
TOTALS	72.3	359.5	351.5	305.3	1016.3	127.8	97.0
Group standard deviations							
0.125 kHz	1.3	8.2	14.5	26.7	38.6	2.0	3.1
0.25 kHz	1.5	11.3	14.5	32.0	45.4	0.4	0.5
0.5 kHz	1.0	77.9	57.9	35.8	149.0	0.4	0.8
1 kHz	49.4	125.6	122.4	82.8	330.0	102.6	62.5
2 kHz	10.1	115.3	112.0	76.0	302.9	21.9	24.3
4 kHz	6.9	4.5	6.1	2.9	9.8	0.5	0.4
8 kHz	7.7	2.9	3.9	9.3	13.3	1.2	0.0
16 kHz	1.6	2.7	3.8	4.4	10.3	1.2	0.8
TOTALS	51.9	310.7	275.2	179.2	744.9	99.3	62.7

1025 Hz center frequency, 134 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M086							
0.125 kHz	0.0	15.2	12.1	40.5	22.6	0.0	0.0
0.25 kHz	1.1	2.9	2.9	28.4	11.4	0.0	0.0
0.5 kHz	0.3	6.3	2.1	25.2	11.2	0.1	0.3
1 kHz	26.0	52.3	56.7	42.5	50.5	29.2	33.7
2 kHz	1.2	6.7	9.8	2.1	6.2	0.1	0.3
4 kHz	7.0	2.7	1.2	1.2	1.7	0.0	0.0
8 kHz	7.6	2.4	0.9	2.4	1.9	0.5	0.0
16 kHz	0.8	1.6	3.2	1.2	2.0	0.0	0.0
Chinchilla N13D							
0.125 kHz	1.3	3.7	6.8	31.2	13.9	0.0	0.5
0.25 kHz	0.4	6.6	10.2	12.9	9.9	0.0	0.3
0.5 kHz	0.8	20.0	13.6	1.2	11.6	0.0	0.0
1 kHz	57.8	83.4	80.3	62.5	75.4	56.7	56.5
2 kHz	2.5	32.5	25.0	20.4	26.0	2.1	1.8
4 kHz	0.0	3.4	0.0	1.5	1.6	0.0	0.0
8 kHz	0.0	0.3	0.9	0.9	0.7	0.0	0.0
16 kHz	0.0	1.7	1.0	0.0	0.9	0.0	0.0
Chinchilla N16D							
0.125 kHz	1.9	5.4	5.4	4.4	5.1	1.6	3.9
0.25 kHz	1.1	7.9	8.2	8.8	8.3	0.1	0.2
0.5 kHz	0.7	57.1	38.2	10.5	35.3	0.0	0.0
1 kHz	5.4	99.1	98.8	64.7	87.5	5.9	13.1
2 kHz	10.2	85.7	85.1	56.5	75.8	9.9	17.7
4 kHz	2.1	2.9	1.7	0.5	1.7	0.1	0.2
8 kHz	1.4	0.8	0.5	0.2	0.5	0.0	0.0
16 kHz	1.5	3.1	2.8	2.2	2.7	0.5	0.6

1025 Hz center frequency, 134 dB peak SPL

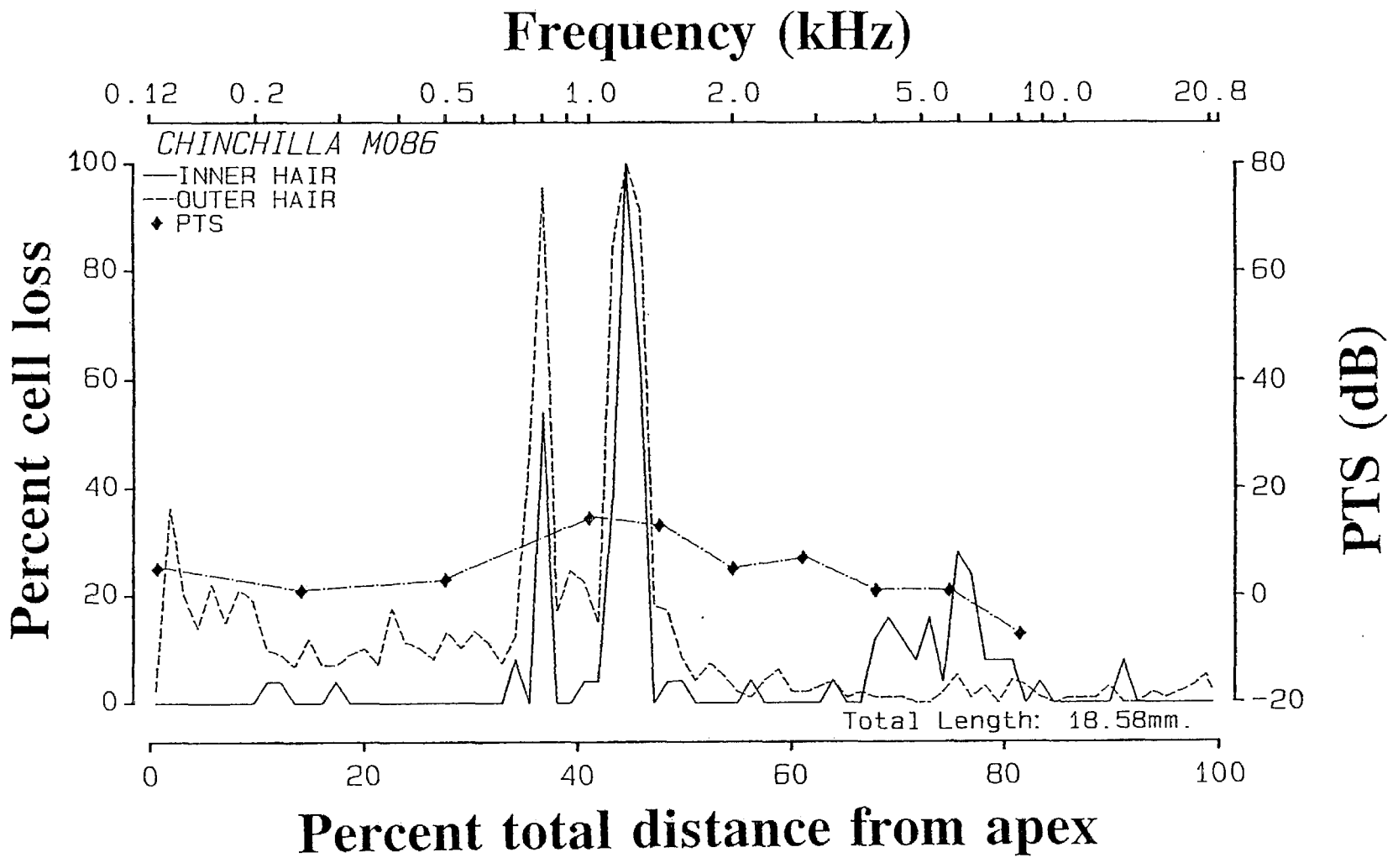
Percent sensory cell losses over octave band frequencies

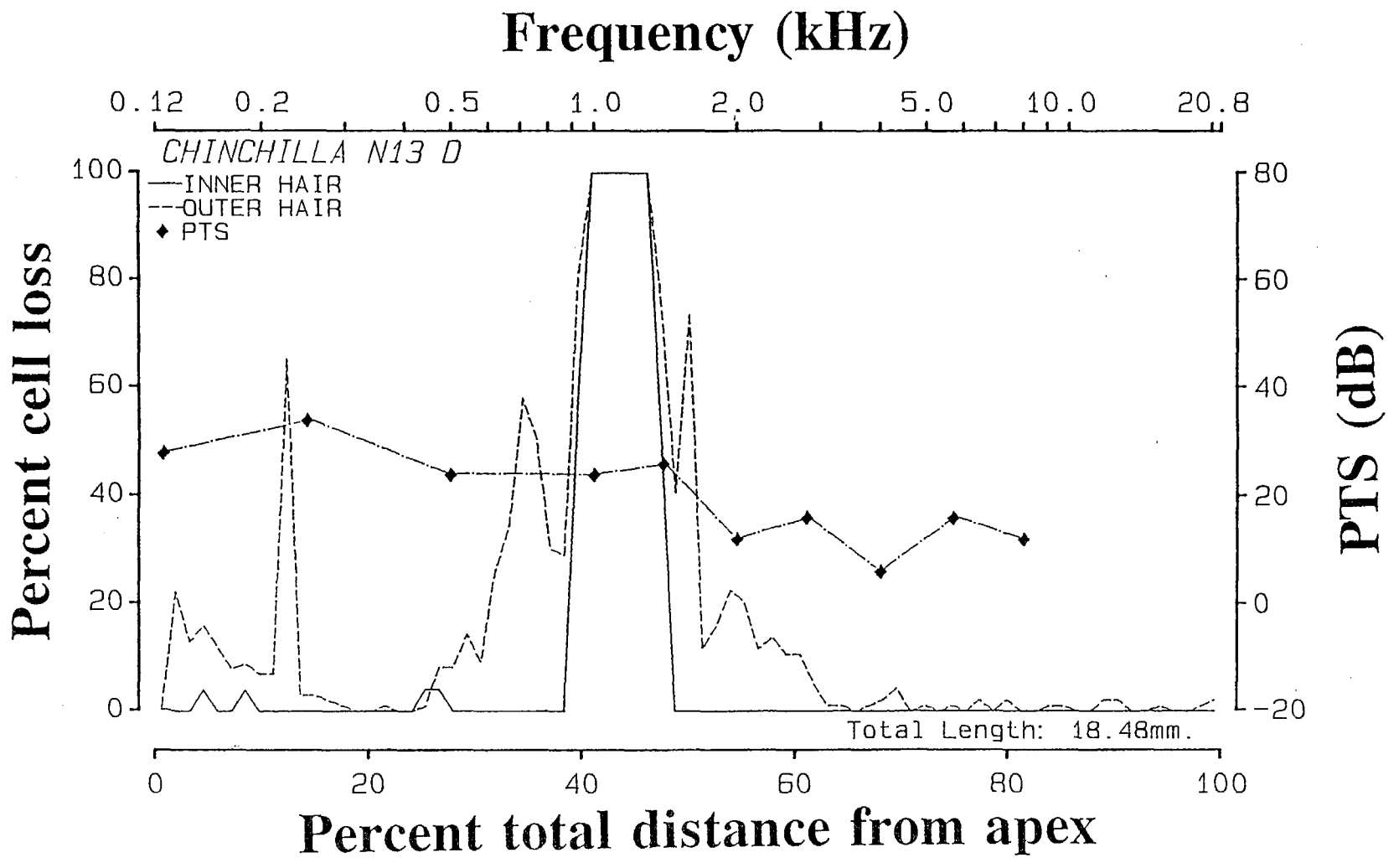
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla N33D							
0.125 kHz	0.0	7.3	25.7	24.2	19.1	0.0	0.0
0.25 kHz	0.0	0.6	0.6	2.1	1.1	0.0	0.0
0.5 kHz	0.8	0.0	0.9	1.2	0.7	0.0	0.0
1 kHz	16.3	22.1	21.5	20.5	21.4	16.8	17.0
2 kHz	0.0	0.9	0.9	0.6	0.8	0.0	0.0
4 kHz	1.9	0.6	1.5	1.5	1.2	0.1	0.0
8 kHz	0.7	0.6	0.3	0.9	0.6	0.0	0.0
16 kHz	0.0	3.1	3.4	3.7	3.4	0.0	0.0
Chinchilla N78D							
0.125 kHz	0.0	4.1	6.2	25.1	11.8	0.0	0.0
0.25 kHz	0.0	0.5	0.8	9.8	3.7	0.0	0.0
0.5 kHz	0.0	32.9	31.7	19.4	28.0	0.0	0.5
1 kHz	22.2	78.3	77.1	53.2	69.5	24.9	34.1
2 kHz	0.4	2.7	5.2	3.6	3.8	0.0	0.6
4 kHz	0.3	1.8	5.2	3.0	3.3	0.0	0.0
8 kHz	0.7	0.3	3.3	7.6	3.7	0.0	0.0
16 kHz	0.0	2.6	3.0	2.3	2.6	0.0	0.3
Chinchilla P01D							
0.125 kHz	0.6	4.7	8.9	6.3	6.6	0.0	1.0
0.25 kHz	0.0	0.9	0.6	2.7	1.4	0.0	0.0
0.5 kHz	0.0	0.6	0.0	0.0	0.2	0.0	0.0
1 kHz	0.0	0.6	2.2	0.6	1.1	0.0	0.0
2 kHz	0.0	0.6	0.6	0.6	0.6	0.0	0.0
4 kHz	0.0	0.0	0.3	0.6	0.3	0.0	0.0
8 kHz	0.0	0.0	0.0	0.3	0.1	0.0	0.0
16 kHz	0.4	1.3	0.6	0.3	0.7	0.0	0.0

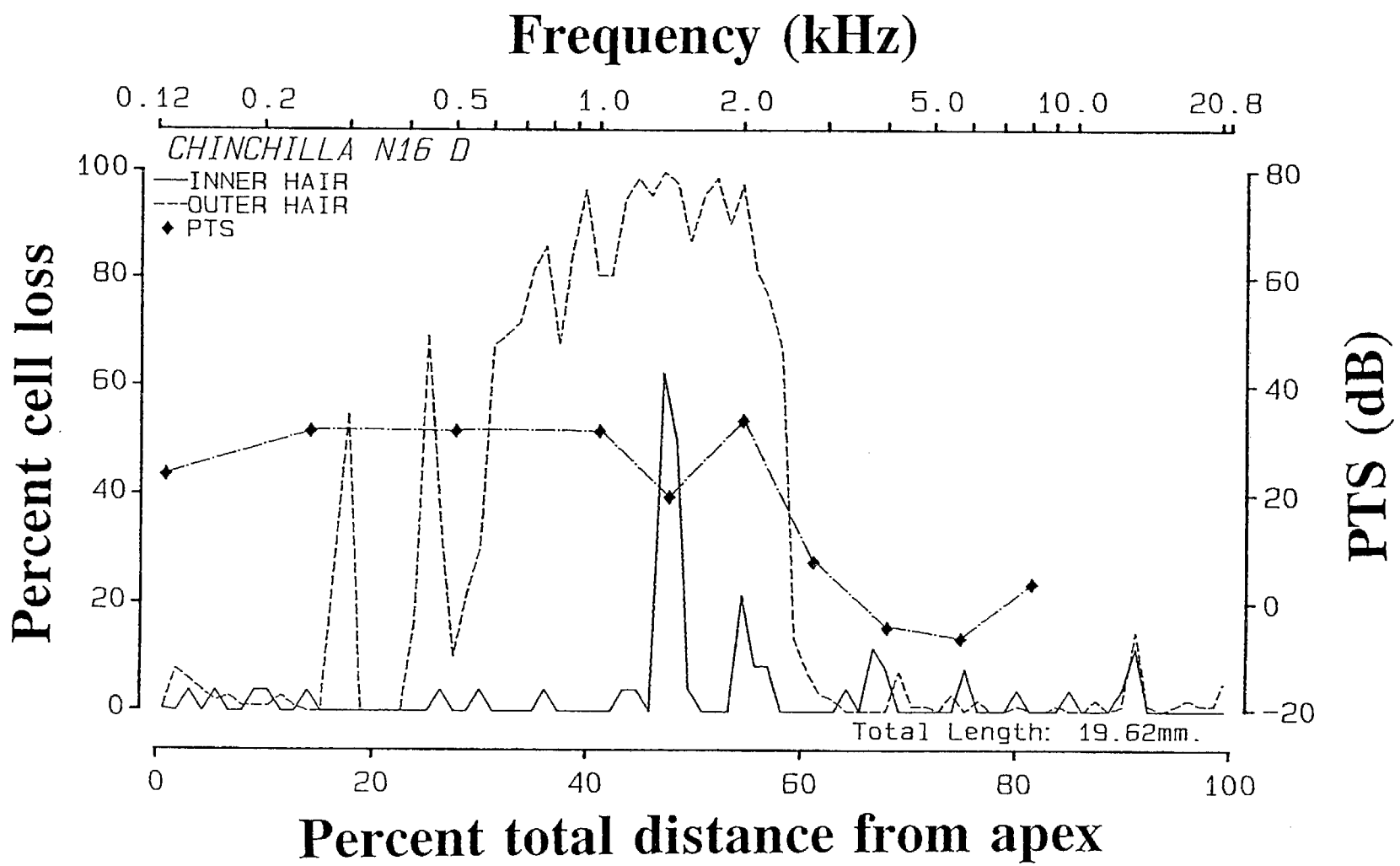
1025 Hz center frequency, 134 dB peak SPL

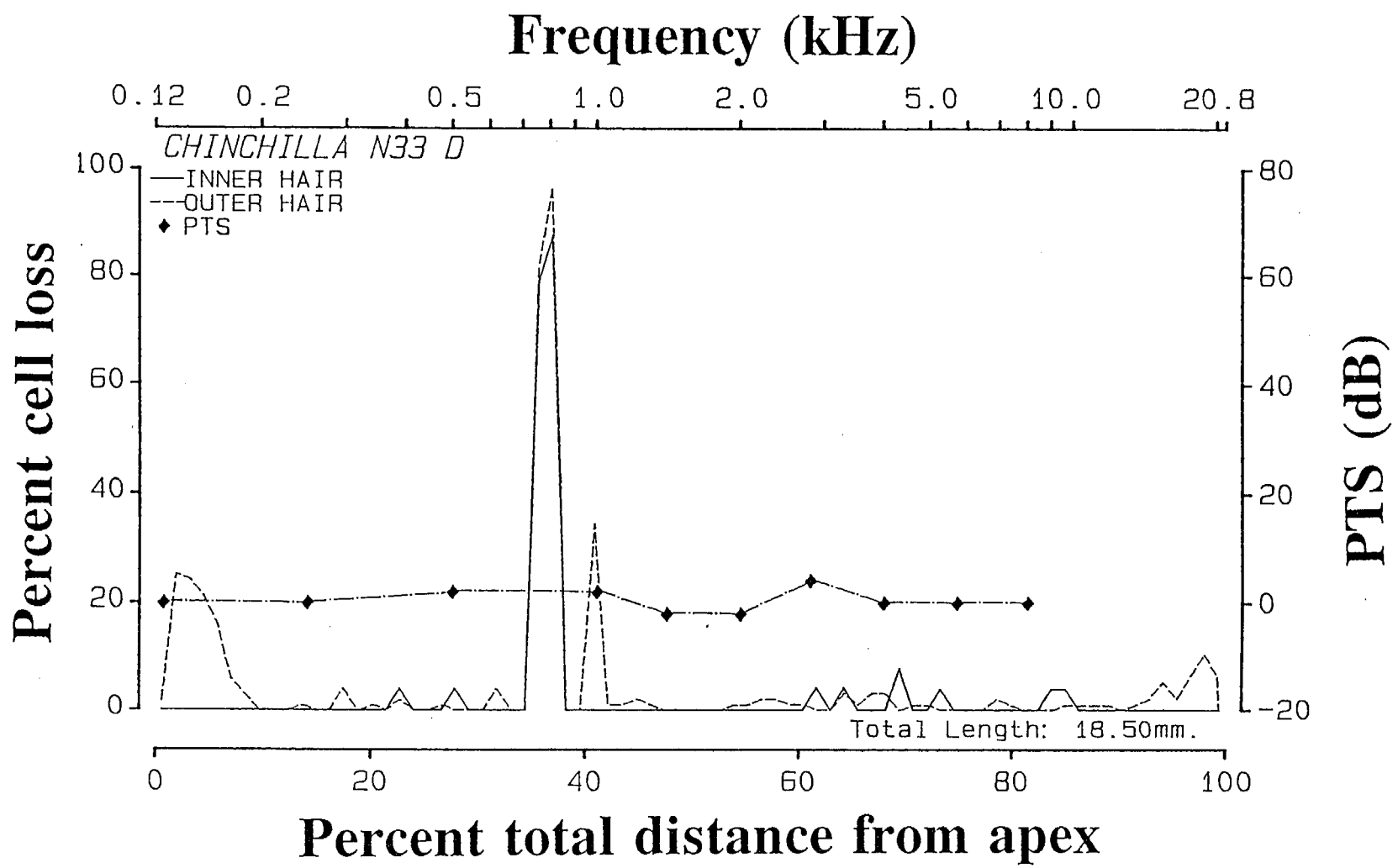
Percent sensory cell losses over octave band frequencies

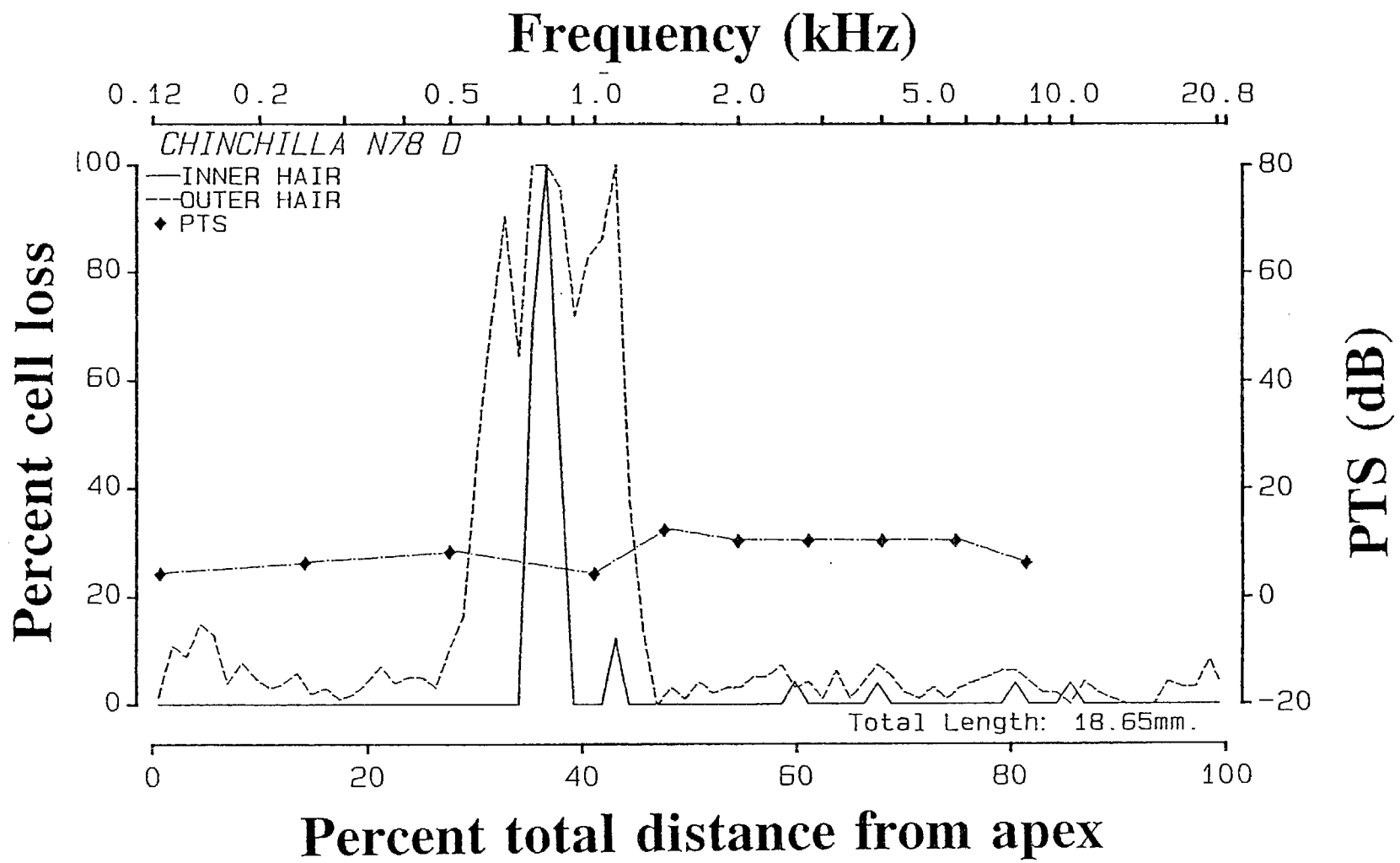
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	0.63	6.73	10.85	21.95	13.18	0.27	0.90
0.25 kHz	0.43	3.23	3.88	10.78	5.97	0.02	0.08
0.5 kHz	0.43	19.48	14.42	9.58	14.49	0.02	0.13
1 kHz	21.28	55.97	56.10	40.67	50.91	22.25	25.73
2 kHz	2.38	21.52	21.10	13.97	18.86	2.02	3.40
4 kHz	1.88	1.90	1.65	1.38	1.64	0.03	0.03
8 kHz	1.73	0.73	0.98	2.05	1.26	0.08	0.00
16 kHz	0.45	2.23	2.33	1.62	2.06	0.08	0.15
Group standard deviations							
0.125 kHz	0.81	4.34	7.66	14.12	6.85	0.65	1.52
0.25 kHz	0.54	3.26	4.26	9.60	4.47	0.04	0.13
0.5 kHz	0.38	22.38	16.78	10.71	14.34	0.04	0.22
1 kHz	20.43	38.31	37.29	25.40	33.58	20.17	19.89
2 kHz	3.94	33.69	32.62	22.16	29.44	3.95	7.04
4 kHz	2.68	1.36	1.86	0.90	0.99	0.05	0.08
8 kHz	2.92	0.86	1.19	2.83	1.36	0.20	0.00
16 kHz	0.61	0.80	1.21	1.39	1.06	0.20	0.25

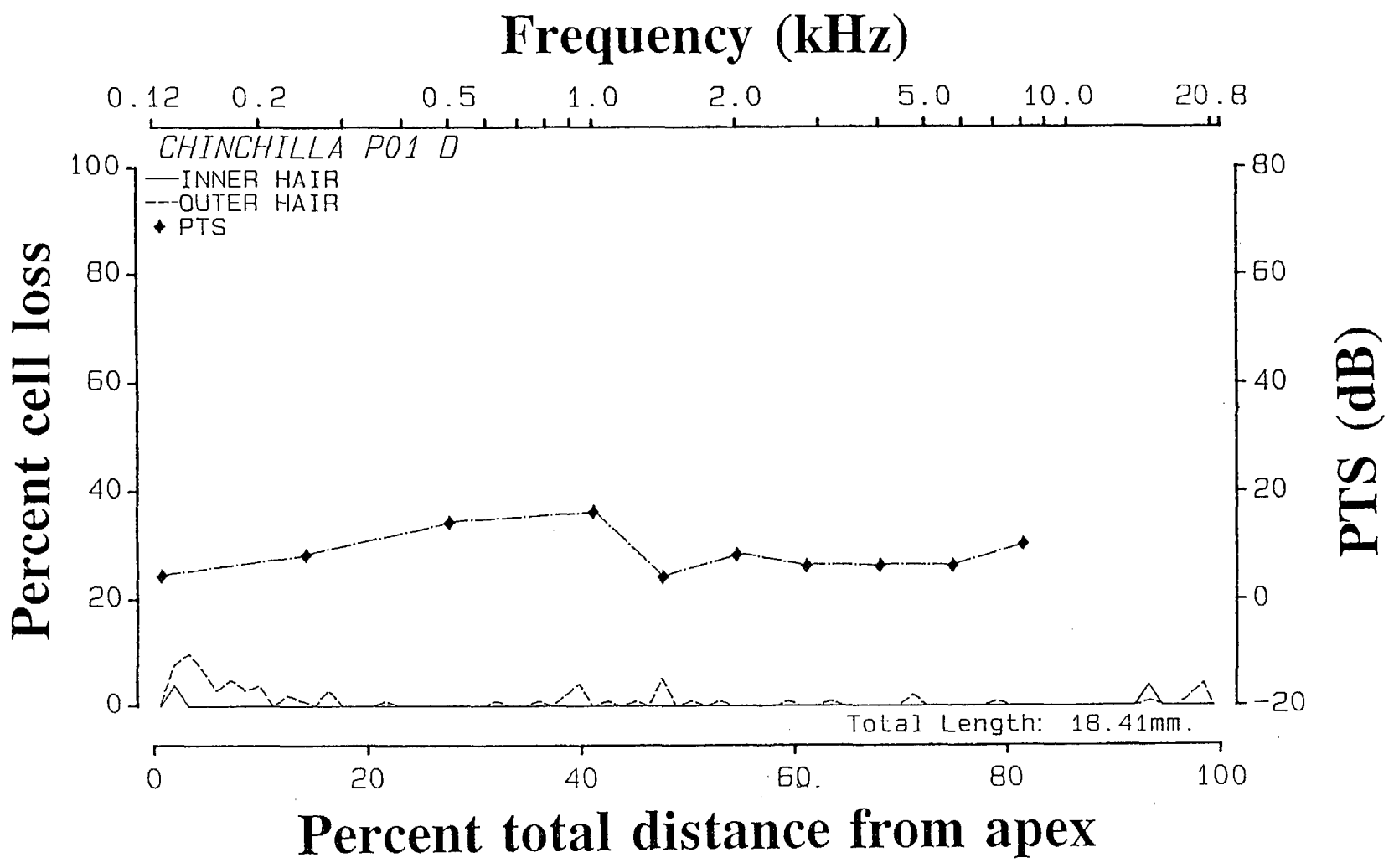

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M086
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.58mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N13 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.48mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N16 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.62mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N33 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.50mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N78 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.65mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P01 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.41mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1025 Hz center frequency, 139 dB peak SPL

Animal #		
L041	-	Completed the entire protocol
L061	-	Completed the entire protocol
L090	-	Completed the entire protocol
L092	-	Completed the entire protocol
L093	-	Completed the entire protocol

1025 Hz center frequency, 139 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L041	25.0	9.0	5.0	3.0	3.0	3.0	0.0	3.0	2.0	5.0
L061	24.0	9.0	6.0	5.0	2.0	5.0	2.0	5.0	1.0	3.0
L090	21.0	9.0	3.0	1.0	1.0	5.0	4.0	3.0	2.0	1.0
L092	28.0	9.0	0.0	-3.0	2.0	7.0	6.0	5.0	1.0	5.0
L093	23.0	13.0	1.0	1.0	3.0	3.0	0.0	1.0	4.0	5.0
Mean	24.2	9.8	3.0	1.4	2.2	4.6	2.4	3.4	2.0	3.8
S.D.	2.6	1.8	2.5	3.0	0.8	1.7	2.6	1.7	1.2	1.8

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L041	37.0	41.0	35.0	39.0	37.0	41.0	40.0	37.0	38.0	37.0
L061	26.0	11.0	8.0	13.0	12.0	13.0	10.0	9.0	11.0	11.0
L090	31.8	25.8	11.8	13.8	11.8	3.8	6.8	5.8	6.8	7.8
L092	51.4	42.4	26.8	30.4	25.4	36.6	37.4	26.4	32.4	29.6
L093	33.0	17.0	15.0	19.0	19.0	21.0	14.0	9.0	12.0	15.0
Mean	35.8	27.4	19.3	23.0	21.0	23.1	21.6	17.4	20.0	20.1
S.D.	9.6	14.1	11.2	11.3	10.6	15.7	15.8	13.6	14.1	12.6

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L041	12.0	32.0	30.0	36.0	34.0	38.0	40.0	34.0	36.0	32.0
L061	2.0	2.0	2.0	8.0	10.0	8.0	8.0	4.0	10.0	8.0
L090	10.8	16.8	8.8	12.8	10.8	-1.2	2.8	2.8	4.8	6.8
L092	23.4	33.4	26.8	33.4	23.4	29.6	31.4	21.4	31.4	24.6
L093	10.0	4.0	14.0	18.0	16.0	18.0	14.0	8.0	8.0	10.0
Mean	11.6	17.6	16.3	21.6	18.8	18.5	19.2	14.0	18.0	16.3
S.D.	7.7	14.9	11.9	12.5	10.0	15.8	15.8	13.4	14.5	11.3

Temporary Threshold Shift (dB): 1025 Hz center frequency, 139 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	58.0	46.0	44.0	42.0	40.0	48.0	36.0	34.0	12.0	10.0	18.0	6.0	14.0	12.0	10.0	58.0
L061	44.0	43.0	40.0	48.0	46.0	34.0	22.0	20.0	8.0	6.0	14.0	2.0	0.0	-2.0	-4.0	48.0
L090	53.0	51.0	49.0	49.0	33.0	33.0	32.0	30.0	18.0	16.0	14.0	3.0	11.0	9.0	17.0	53.0
L092	27.0	47.0	57.0	34.0	42.0	43.0	20.0	15.0	24.0	23.0	22.0	21.0	20.0	27.0	27.0	57.0
L093	61.0	59.0	37.0	61.0	51.0	49.0	47.0	35.0	23.0	26.0	14.0	12.0	10.0	8.0	6.0	61.0
Mean	48.6	49.2	45.4	46.8	42.4	41.4	31.4	26.8	17.0	16.2	16.4	8.8	11.0	10.8	11.2	55.4
S.D.	13.7	6.2	7.9	9.9	6.7	7.6	11.0	8.9	6.9	8.4	3.6	7.8	7.3	10.5	11.6	5.0

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	66.0	54.0	62.0	70.0	58.0	66.0	44.0	42.0	40.0	38.0	36.0	34.0	32.0	30.0	28.0	70.0
L061	50.0	49.0	56.0	54.0	62.0	40.0	18.0	26.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	62.0
L090	57.0	65.0	53.0	63.0	57.0	37.0	46.0	44.0	22.0	20.0	28.0	17.0	15.0	13.0	11.0	65.0
L092	47.0	38.0	79.0	64.0	82.0	53.0	40.0	35.0	24.0	23.0	32.0	41.0	30.0	27.0	37.0	82.0
L093	63.0	71.0	49.0	67.0	63.0	51.0	49.0	37.0	25.0	8.0	16.0	4.0	2.0	0.0	-2.0	71.0
Mean	56.6	55.4	59.8	63.6	64.4	49.4	39.4	36.8	23.0	18.2	22.4	18.8	17.0	14.8	15.2	70.0
S.D.	8.1	13.1	11.7	6.0	10.2	11.6	12.4	7.1	12.8	14.0	14.6	18.6	13.6	13.4	16.8	7.7

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	66.0	64.0	72.0	70.0	58.0	66.0	44.0	32.0	40.0	38.0	36.0	34.0	22.0	30.0	28.0	72.0
L061	60.0	59.0	66.0	64.0	52.0	40.0	18.0	16.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	66.0
L090	59.0	47.0	55.0	55.0	29.0	39.0	48.0	26.0	24.0	12.0	10.0	9.0	7.0	5.0	13.0	59.0
L092	33.0	34.0	65.0	80.0	68.0	50.0	36.0	51.0	40.0	29.0	18.0	37.0	35.0	12.0	32.0	80.0
L093	61.0	79.0	77.0	75.0	71.0	59.0	57.0	45.0	23.0	36.0	24.0	22.0	10.0	8.0	6.0	79.0
Mean	55.8	56.6	67.0	68.8	55.6	50.8	40.6	34.0	26.2	23.4	17.6	20.0	16.0	11.8	16.2	71.2
S.D.	13.0	17.1	8.3	9.7	16.7	11.8	14.7	14.2	14.9	15.7	13.7	16.5	12.4	10.6	13.3	8.9

Temporary Threshold Shift (dB): 1025 Hz center frequency, 139 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	62.0	60.0	78.0	76.0	74.0	72.0	60.0	48.0	36.0	34.0	42.0	40.0	28.0	36.0	34.0	78.0
L061	46.0	55.0	72.0	70.0	68.0	36.0	24.0	22.0	20.0	8.0	6.0	4.0	12.0	10.0	8.0	72.0
L090	65.0	63.0	61.0	51.0	35.0	25.0	34.0	22.0	20.0	8.0	16.0	15.0	13.0	11.0	9.0	65.0
L092	61.0	52.0	63.0	78.0	66.0	47.0	44.0	59.0	38.0	27.0	26.0	45.0	34.0	21.0	41.0	78.0
L093	55.0	73.0	61.0	59.0	55.0	43.0	51.0	39.0	27.0	30.0	28.0	26.0	14.0	12.0	10.0	73.0
Mean	57.8	60.6	67.0	66.8	59.6	44.6	42.6	38.0	28.2	21.4	23.6	26.0	20.2	18.0	20.4	73.2
S.D.	7.5	8.1	7.7	11.5	15.4	17.4	14.1	16.2	8.6	12.5	13.5	17.0	10.1	11.0	15.8	5.4

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	60.0	58.0	76.0	74.0	72.0	70.0	58.0	56.0	34.0	42.0	40.0	38.0	26.0	34.0	32.0	76.0
L061	56.0	65.0	72.0	70.0	68.0	46.0	24.0	22.0	20.0	18.0	16.0	4.0	12.0	10.0	8.0	72.0
L090	63.0	61.0	69.0	59.0	33.0	33.0	32.0	30.0	18.0	16.0	14.0	13.0	11.0	9.0	7.0	69.0
L092	33.0	24.0	55.0	70.0	68.0	39.0	46.0	31.0	40.0	29.0	18.0	37.0	16.0	13.0	33.0	70.0
L093	71.0	69.0	67.0	65.0	61.0	49.0	47.0	35.0	33.0	26.0	24.0	22.0	10.0	8.0	16.0	71.0
Mean	56.6	55.4	67.8	67.6	60.4	47.4	41.4	34.8	29.0	26.2	22.4	22.8	15.0	14.8	19.2	71.6
S.D.	14.3	18.0	7.9	5.8	15.8	14.1	13.4	12.8	9.5	10.4	10.5	14.9	6.6	10.9	12.6	2.7

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	62.0	60.0	78.0	76.0	74.0	72.0	60.0	58.0	46.0	34.0	42.0	40.0	38.0	36.0	34.0	78.0
L061	54.0	53.0	70.0	78.0	66.0	44.0	22.0	30.0	28.0	16.0	14.0	2.0	10.0	8.0	6.0	78.0
L090	51.0	59.0	67.0	67.0	31.0	41.0	30.0	28.0	16.0	4.0	2.0	1.0	-1.0	-3.0	-5.0	67.0
L092	49.0	20.0	61.0	56.0	54.0	45.0	32.0	34.0	26.0	25.0	24.0	34.0	32.0	29.0	29.0	61.0
L093	53.0	71.0	79.0	77.0	63.0	51.0	49.0	37.0	45.0	28.0	16.0	14.0	22.0	20.0	18.0	79.0
Mean	53.8	52.6	71.0	70.8	57.6	50.6	38.6	37.4	32.2	21.4	19.6	18.2	20.2	18.0	16.4	72.6
S.D.	5.0	19.4	7.6	9.4	16.5	12.5	15.5	12.0	13.0	11.7	14.8	18.0	15.9	15.7	16.1	8.1

Temporary Threshold Shift (dB): 1025 Hz center frequency, 139 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	74.0	62.0	70.0	78.0	66.0	74.0	62.0	50.0	38.0	36.0	44.0	42.0	40.0	38.0	36.0	78.0
L061	66.0	55.0	72.0	70.0	68.0	56.0	44.0	32.0	10.0	18.0	6.0	4.0	12.0	10.0	8.0	72.0
L090	61.0	69.0	57.0	47.0	31.0	31.0	30.0	18.0	6.0	4.0	2.0	1.0	9.0	-3.0	5.0	69.0
L092	50.0	50.0	51.0	66.0	74.0	35.0	42.0	37.0	36.0	25.0	24.0	43.0	32.0	29.0	29.0	74.0
L093	45.0	33.0	61.0	59.0	55.0	33.0	41.0	39.0	37.0	30.0	18.0	16.0	14.0	12.0	10.0	61.0
Mean	59.2	53.8	62.2	64.0	58.8	45.8	43.8	35.2	25.4	22.6	18.8	21.2	21.4	17.2	17.6	70.8
S.D.	11.8	13.7	8.8	11.7	17.0	18.7	11.5	11.6	16.0	12.3	16.6	20.2	13.7	16.3	13.9	6.4

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	60.0	58.0	66.0	74.0	62.0	70.0	58.0	36.0	34.0	32.0	40.0	38.0	26.0	34.0	32.0	74.0
L061	52.0	51.0	58.0	56.0	54.0	52.0	30.0	28.0	16.0	4.0	12.0	0.0	8.0	-4.0	4.0	58.0
L090	41.0	39.0	37.0	47.0	11.0	21.0	10.0	8.0	16.0	4.0	2.0	1.0	-1.0	7.0	5.0	47.0
L092	19.0	50.0	61.0	56.0	64.0	35.0	32.0	17.0	16.0	15.0	14.0	13.0	32.0	39.0	9.0	64.0
L093	43.0	41.0	69.0	57.0	53.0	31.0	39.0	27.0	25.0	18.0	16.0	4.0	2.0	10.0	8.0	69.0
Mean	43.0	47.8	58.2	58.0	48.8	41.8	33.8	23.2	21.4	14.6	16.8	11.2	13.4	17.2	11.6	62.4
S.D.	15.4	7.8	12.6	9.8	21.7	19.3	17.3	10.9	8.1	11.6	14.0	15.8	14.8	18.5	11.6	10.4

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	70.0	58.0	66.0	74.0	62.0	70.0	58.0	36.0	44.0	42.0	40.0	38.0	36.0	34.0	32.0	74.0
L061	66.0	65.0	72.0	80.0	78.0	56.0	34.0	32.0	30.0	18.0	16.0	4.0	12.0	10.0	8.0	80.0
L090	41.0	49.0	37.0	37.0	31.0	21.0	40.0	28.0	16.0	4.0	2.0	1.0	-1.0	7.0	15.0	49.0
L092	33.0	34.0	65.0	70.0	68.0	39.0	25.0	31.0	20.0	19.0	18.0	27.0	26.0	43.0	43.0	70.0
L093	39.0	37.0	55.0	53.0	39.0	27.0	35.0	33.0	31.0	24.0	12.0	10.0	8.0	6.0	4.0	55.0
Mean	49.8	48.6	59.0	62.8	55.6	42.6	38.4	32.0	28.2	21.4	17.6	16.0	16.2	20.0	20.4	65.6
S.D.	16.9	13.3	13.7	17.6	19.9	20.3	12.2	2.9	10.9	13.7	14.0	15.9	14.7	17.3	16.6	13.1

Temporary Threshold Shift (dB): 1025 Hz center frequency, 139 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L041	58.0	56.0	64.0	72.0	60.0	68.0	56.0	44.0	42.0	40.0	38.0	36.0	24.0	32.0	30.0	72.0
L061	60.0	59.0	66.0	64.0	72.0	50.0	38.0	26.0	24.0	2.0	10.0	8.0	16.0	4.0	2.0	72.0
L090	23.0	31.0	39.0	39.0	13.0	13.0	32.0	20.0	28.0	16.0	4.0	13.0	1.0	9.0	7.0	39.0
L092	29.0	10.0	61.0	46.0	60.0	51.0	28.0	17.0	16.0	15.0	24.0	23.0	32.0	29.0	15.0	61.0
L093	39.0	37.0	45.0	53.0	39.0	37.0	35.0	23.0	31.0	24.0	22.0	10.0	8.0	6.0	4.0	53.0
Mean	41.8	38.6	55.0	54.8	48.8	43.8	37.8	26.0	28.2	19.4	19.6	18.0	16.2	16.0	11.6	59.4
S.D.	16.7	20.0	12.2	13.3	23.3	20.4	10.8	10.6	9.6	14.0	13.2	11.6	12.3	13.4	11.4	13.9

1025 Hz center frequency, 139 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
L041	116	1797	1612	1414	4823
L061	107	1511	1493	1218	4222
L090	80	487	497	284	1268
L092	171	1006	901	683	2590
L093	78	850	892	840	2582
Group mean	110				3097
S.D.	38				1424
S.E.	17				637

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	2.0	79.0
	0.25 kHz	2.6	97.8
	0.5 kHz	3.0	216.4
	1 kHz	51.4	794.2
	2 kHz	5.6	693.2
	4 kHz	3.6	456.8
	8 kHz	15.0	408.0
	16 kHz	27.2	351.6
Standard deviations			
	0.125 kHz	1.6	30.6
	0.25 kHz	2.1	77.8
	0.5 kHz	3.1	149.8
	1 kHz	49.6	131.1
	2 kHz	7.2	378.6
	4 kHz	3.6	391.4
	8 kHz	16.1	530.7
	16 kHz	38.7	463.4

1025 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L041							
0.125 kHz	0	9	13	29	51	0	1
0.25 kHz	0	39	20	45	104	0	0
0.5 kHz	3	185	89	24	298	1	2
1 kHz	2	320	293	202	815	0	13
2 kHz	1	320	312	260	892	1	4
4 kHz	2	324	312	289	925	0	0
8 kHz	19	333	330	319	982	26	22
16 kHz	89	267	243	246	756	28	43
TOTALS	116	1797	1612	1414	4823	56	85
Chinchilla L061							
0.125 kHz	3	27	24	37	88	0	0
0.25 kHz	4	22	7	43	72	0	0
0.5 kHz	5	21	14	12	47	0	0
1 kHz	1	204	205	162	571	0	4
2 kHz	4	306	309	131	746	0	1
4 kHz	8	282	285	184	751	1	4
8 kHz	40	332	332	332	996	61	48
16 kHz	42	317	317	317	951	33	27
TOTALS	107	1511	1493	1218	4222	95	84
Chinchilla L090							
0.125 kHz	2	15	47	56	118	0	0
0.25 kHz	1	14	8	14	36	2	1
0.5 kHz	0	106	101	42	249	0	0
1 kHz	74	328	319	161	808	150	95
2 kHz	0	14	13	3	30	0	2
4 kHz	0	2	1	2	5	0	0
8 kHz	0	1	2	1	4	0	0
16 kHz	3	7	6	5	18	0	0
TOTALS	80	487	497	284	1268	152	98

1025 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L092							
0.125 kHz	4	14	20	59	93	0	0
0.25 kHz	5	79	67	83	229	43	51
0.5 kHz	7	244	146	15	405	0	0
1 kHz	116	293	298	282	873	236	154
2 kHz	18	309	304	229	842	1	4
4 kHz	7	62	63	11	136	0	0
8 kHz	14	4	0	2	6	0	0
16 kHz	0	1	3	2	6	0	0
TOTALS	171	1006	901	683	2590	280	209
Chinchilla L093							
0.125 kHz	1	3	9	33	45	0	0
0.25 kHz	3	4	14	30	48	0	0
0.5 kHz	0	23	33	27	83	0	0
1 kHz	64	312	307	285	904	124	87
2 kHz	5	313	322	321	956	2	15
4 kHz	1	169	188	110	467	0	1
8 kHz	2	17	13	22	52	1	0
16 kHz	2	9	6	12	27	0	0
TOTALS	78	850	892	840	2582	127	103
Group means							
0.125 kHz	2.0	13.6	22.6	42.8	79.0	0.0	0.2
0.25 kHz	2.6	31.6	23.2	43.0	97.8	9.0	10.4
0.5 kHz	3.0	115.8	76.6	24.0	216.4	0.2	0.4
1 kHz	51.4	291.4	284.4	218.4	794.2	102.0	70.6
2 kHz	5.6	252.4	252.0	188.8	693.2	0.8	5.2
4 kHz	3.6	167.8	169.8	119.2	456.8	0.2	1.0
8 kHz	15.0	137.4	135.4	135.2	408.0	17.6	14.0
16 kHz	27.2	120.2	115.0	116.4	351.6	12.2	14.0
TOTALS	110.4	1130.2	1079.0	887.8	3097.0	142.0	115.8

1025 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group standard deviations							
0.125 kHz	1.6	8.9	14.8	13.8	30.6	0.0	0.4
0.25 kHz	2.1	29.4	25.0	25.6	77.8	19.0	22.7
0.5 kHz	3.1	98.6	53.4	11.8	149.8	0.4	0.9
1 kHz	49.6	50.6	45.5	61.7	131.1	101.9	62.4
2 kHz	7.2	133.4	133.8	124.5	378.6	0.8	5.6
4 kHz	3.6	138.0	135.8	121.0	391.4	0.4	1.7
8 kHz	16.1	178.2	178.6	174.0	530.7	26.7	21.3
16 kHz	38.7	157.9	152.9	152.8	463.4	16.8	20.0
TOTALS	37.7	523.8	463.9	445.7	1424.1	85.1	52.7

1025 Hz center frequency, 139 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L041							
0.125 kHz	0.0	4.5	6.6	14.7	8.6	0.0	0.5
0.25 kHz	0.0	11.3	5.7	13.0	10.0	0.0	0.0
0.5 kHz	1.1	54.0	26.0	7.0	29.0	0.1	0.5
1 kHz	0.7	97.5	89.3	61.5	82.8	0.0	3.9
2 kHz	0.4	95.8	93.4	77.8	89.0	0.1	1.1
4 kHz	0.7	97.0	93.4	86.5	92.3	0.0	0.0
8 kHz	7.0	99.4	98.5	95.2	97.7	4.8	6.5
16 kHz	36.3	88.1	80.1	81.1	83.1	5.7	14.1
Chinchilla L061							
0.125 kHz	2.0	13.8	12.3	18.9	15.0	0.0	0.0
0.25 kHz	1.5	6.4	2.0	12.5	7.0	0.0	0.0
0.5 kHz	1.9	6.1	4.1	3.5	4.6	0.0	0.0
1 kHz	0.3	62.7	63.0	49.8	58.5	0.0	1.2
2 kHz	1.6	91.8	92.7	39.3	74.6	0.0	0.3
4 kHz	3.0	84.9	85.8	55.4	75.4	0.1	1.2
8 kHz	14.9	100.0	100.0	100.0	100.0	11.3	14.4
16 kHz	16.4	100.0	100.0	100.0	100.0	6.4	8.5
Chinchilla L090							
0.125 kHz	1.2	7.2	22.7	27.0	19.0	0.0	0.0
0.25 kHz	0.3	3.8	2.2	3.8	3.3	0.3	0.2
0.5 kHz	0.0	29.3	27.9	11.6	22.9	0.0	0.0
1 kHz	27.7	95.3	92.7	46.8	78.3	27.0	27.6
2 kHz	0.0	3.9	3.6	0.8	2.8	0.0	0.5
4 kHz	0.0	0.5	0.2	0.5	0.4	0.0	0.0
8 kHz	0.0	0.2	0.5	0.2	0.3	0.0	0.0
16 kHz	1.1	2.2	1.9	1.5	1.9	0.0	0.0

1025 Hz center frequency, 139 dB peak SPL

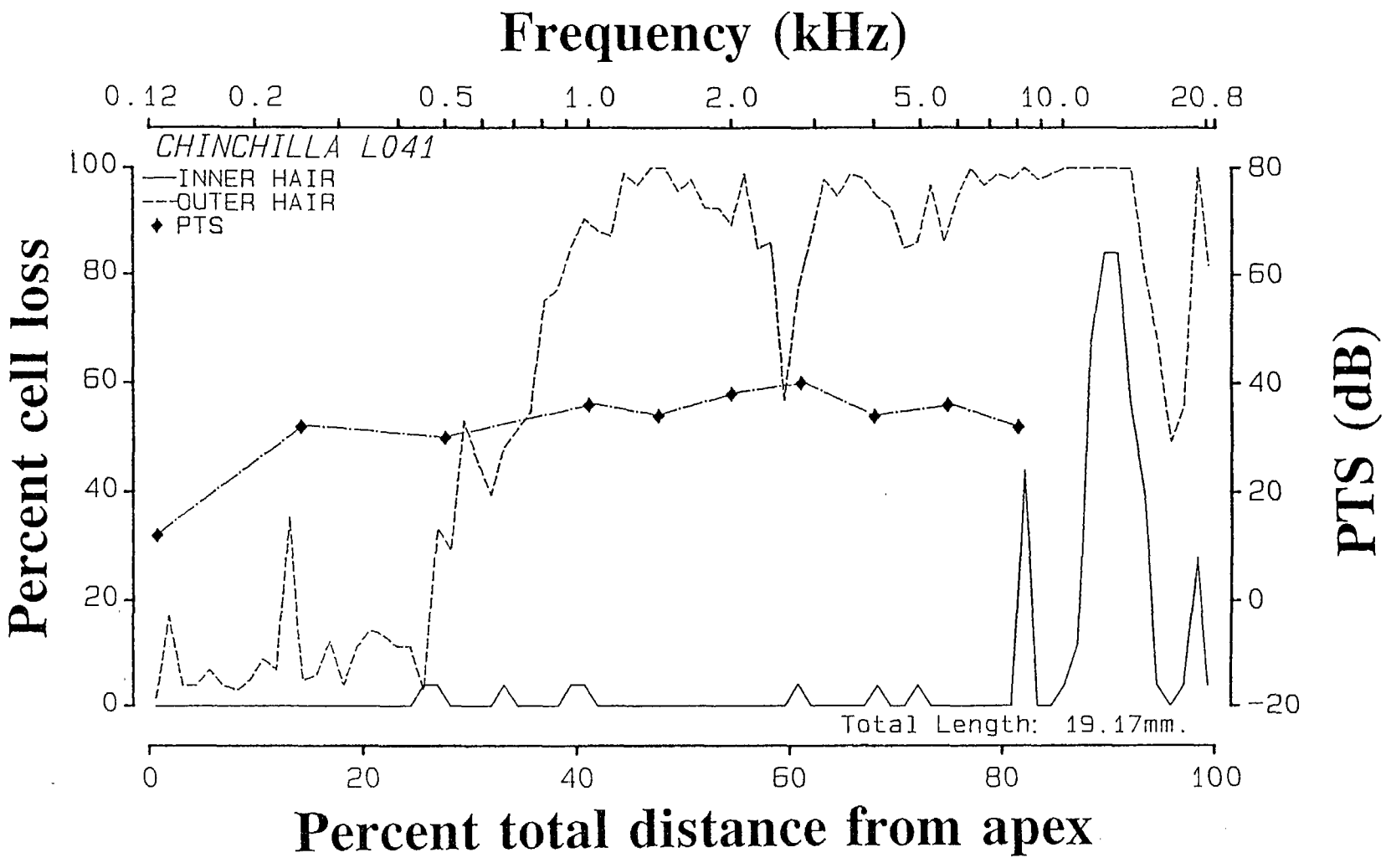
Percent sensory cell losses over octave band frequencies

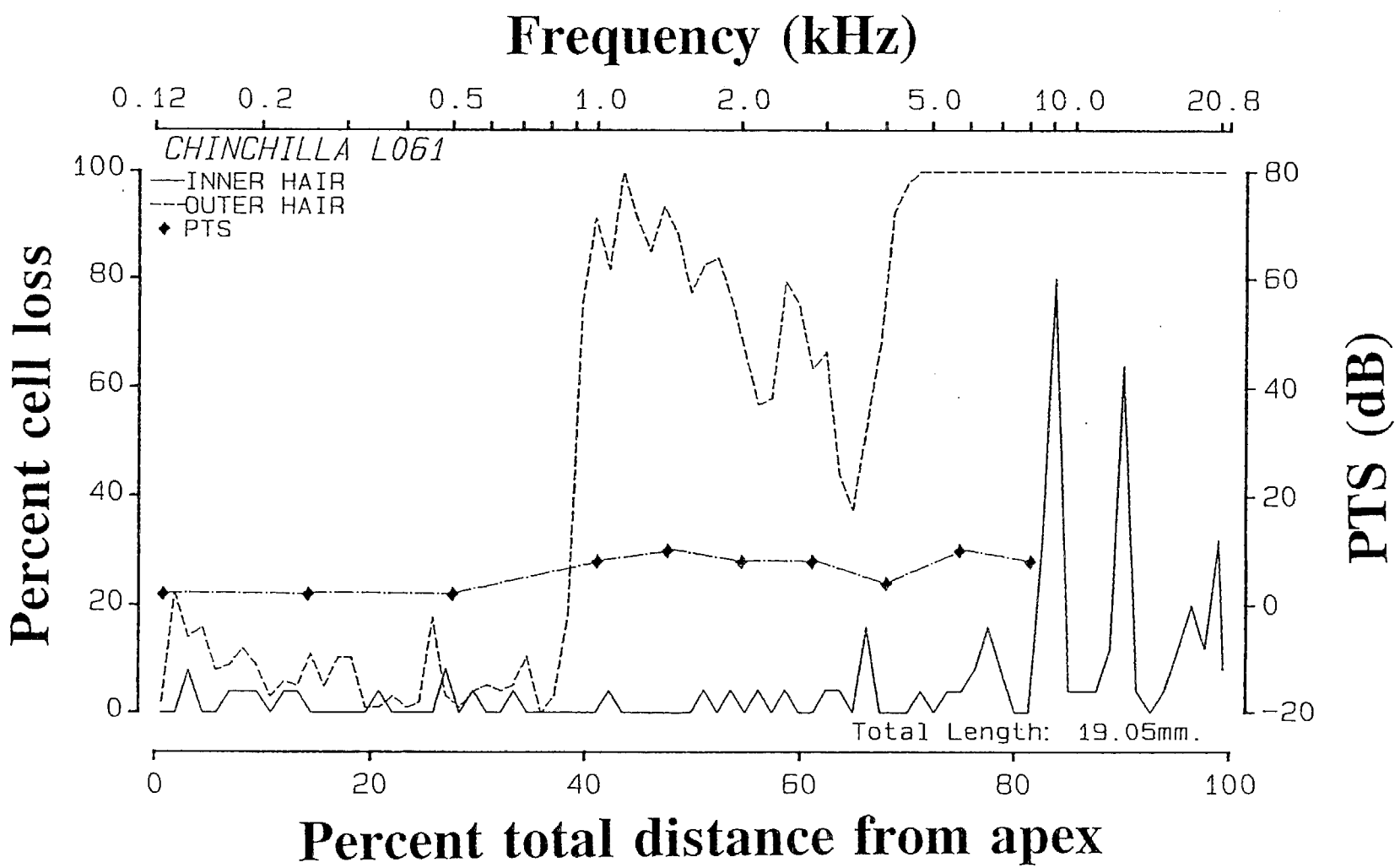
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L092							
0.125 kHz	2.8	7.6	10.9	32.4	17.0	0.0	0.0
0.25 kHz	2.0	24.7	21.0	26.0	23.9	8.7	15.9
0.5 kHz	2.9	76.9	46.0	4.7	42.5	0.0	0.0
1 kHz	49.3	96.6	98.3	93.0	96.0	48.2	50.8
2 kHz	7.8	99.6	98.0	73.8	90.5	0.2	1.2
4 kHz	2.8	20.0	20.3	3.5	14.6	0.0	0.0
8 kHz	5.6	1.2	0.0	0.6	0.6	0.0	0.0
16 kHz	0.0	0.3	1.0	0.7	0.7	0.0	0.0
Chinchilla L093							
0.125 kHz	0.6	1.5	4.6	17.1	7.7	0.0	0.0
0.25 kHz	1.1	1.1	4.1	8.8	4.7	0.0	0.0
0.5 kHz	0.0	6.8	9.8	8.0	8.2	0.0	0.0
1 kHz	25.8	97.1	95.6	88.7	93.8	23.9	27.1
2 kHz	2.0	95.4	98.1	97.8	97.1	0.3	4.5
4 kHz	0.3	51.6	57.4	33.6	47.5	0.0	0.3
8 kHz	0.7	5.1	3.9	6.7	5.2	0.1	0.0
16 kHz	0.7	2.8	1.8	3.7	2.8	0.0	0.0
Group means							
0.125 kHz	1.32	6.92	11.42	22.02	13.45	0.00	0.10
0.25 kHz	0.98	9.46	7.00	12.82	9.76	1.80	3.22
0.5 kHz	1.18	34.62	22.76	6.96	21.45	0.02	0.10
1 kHz	20.76	89.84	87.78	67.96	81.86	19.82	22.12
2 kHz	2.36	77.30	77.16	57.90	70.79	0.12	1.52
4 kHz	1.36	50.80	51.42	35.90	46.04	0.02	0.30
8 kHz	5.64	41.18	40.58	40.54	40.77	3.24	4.18
16 kHz	10.90	38.68	36.96	37.40	37.68	2.42	4.52

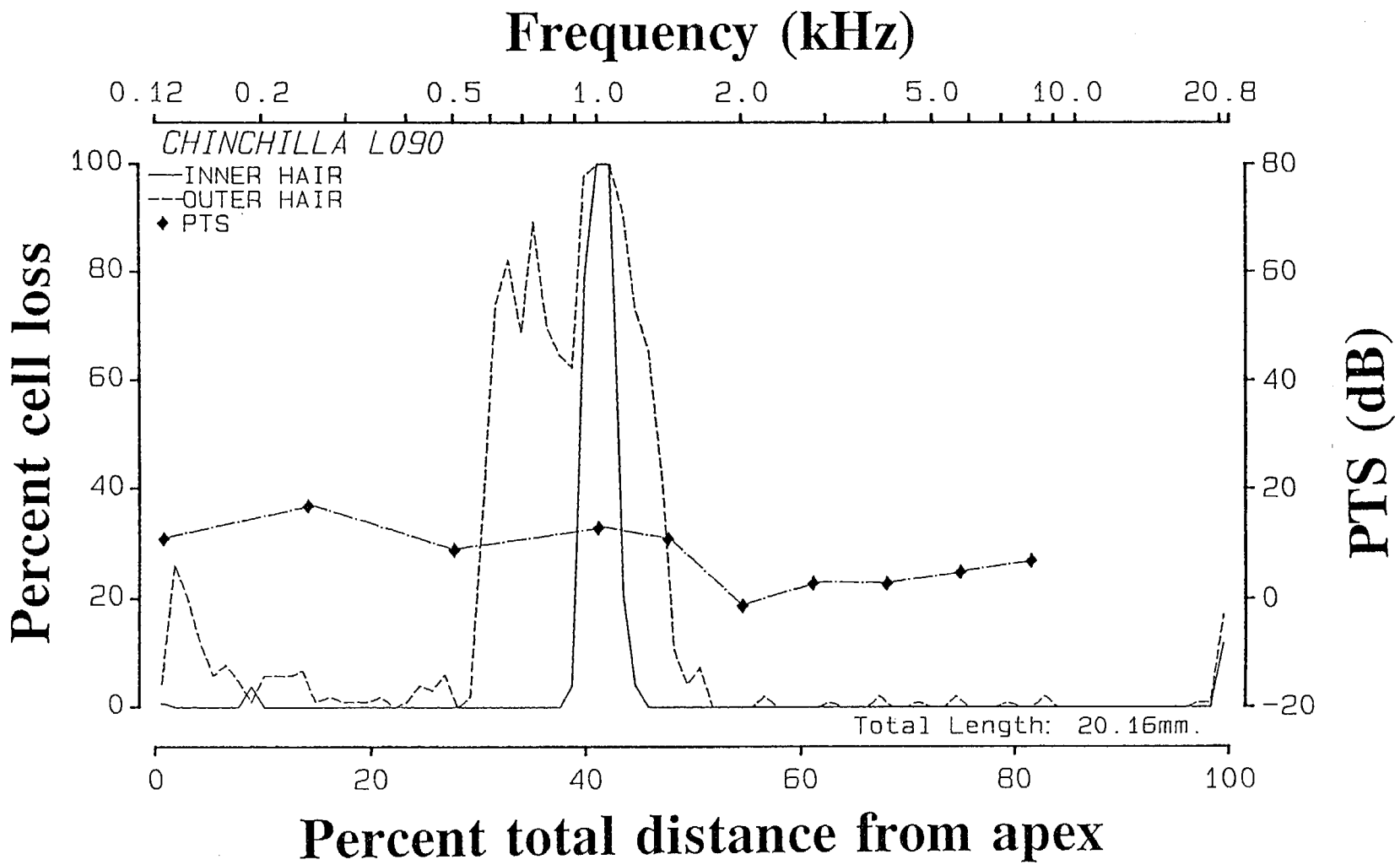
1025 Hz center frequency, 139 dB peak SPL

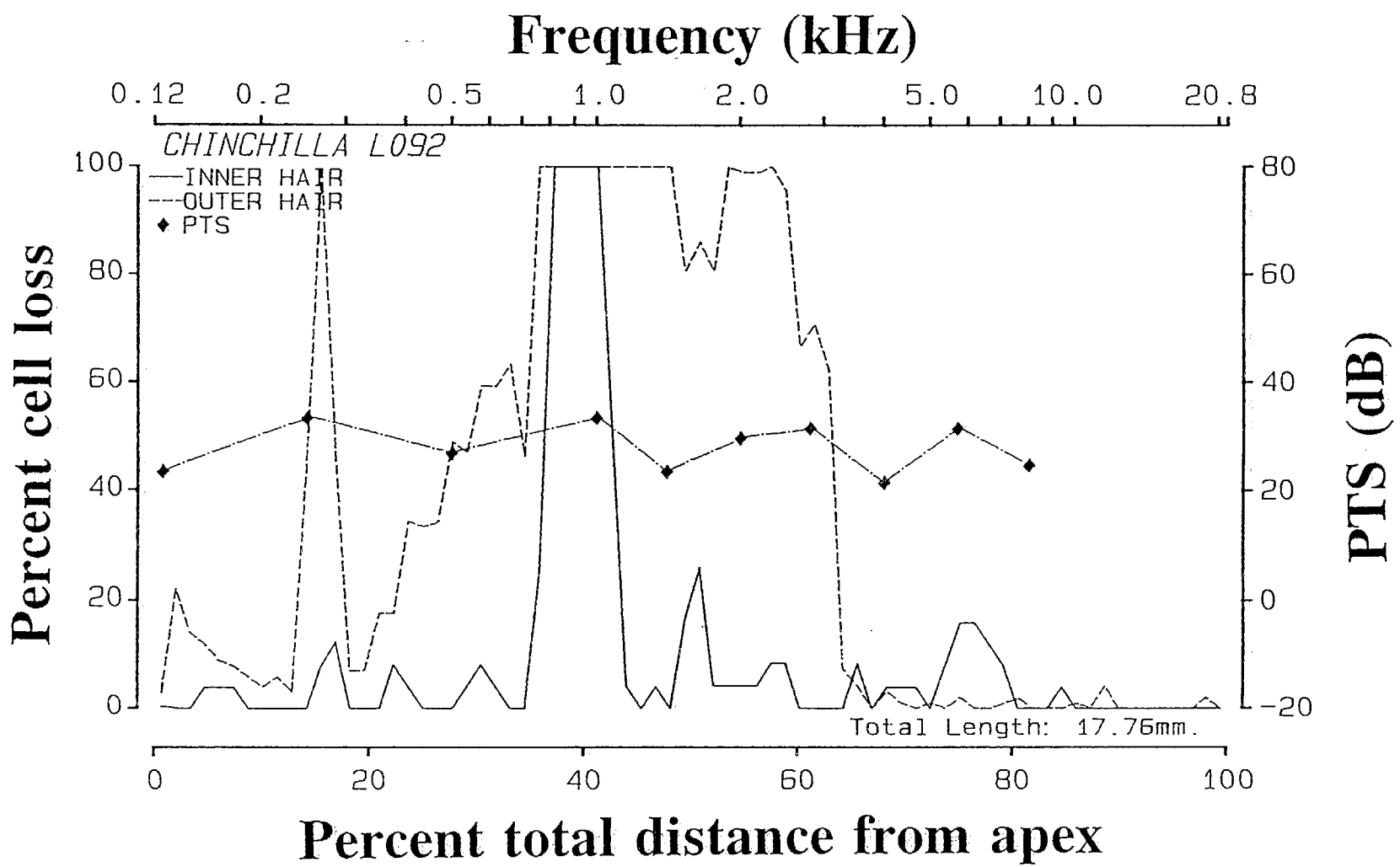
Percent sensory cell losses over octave band frequencies

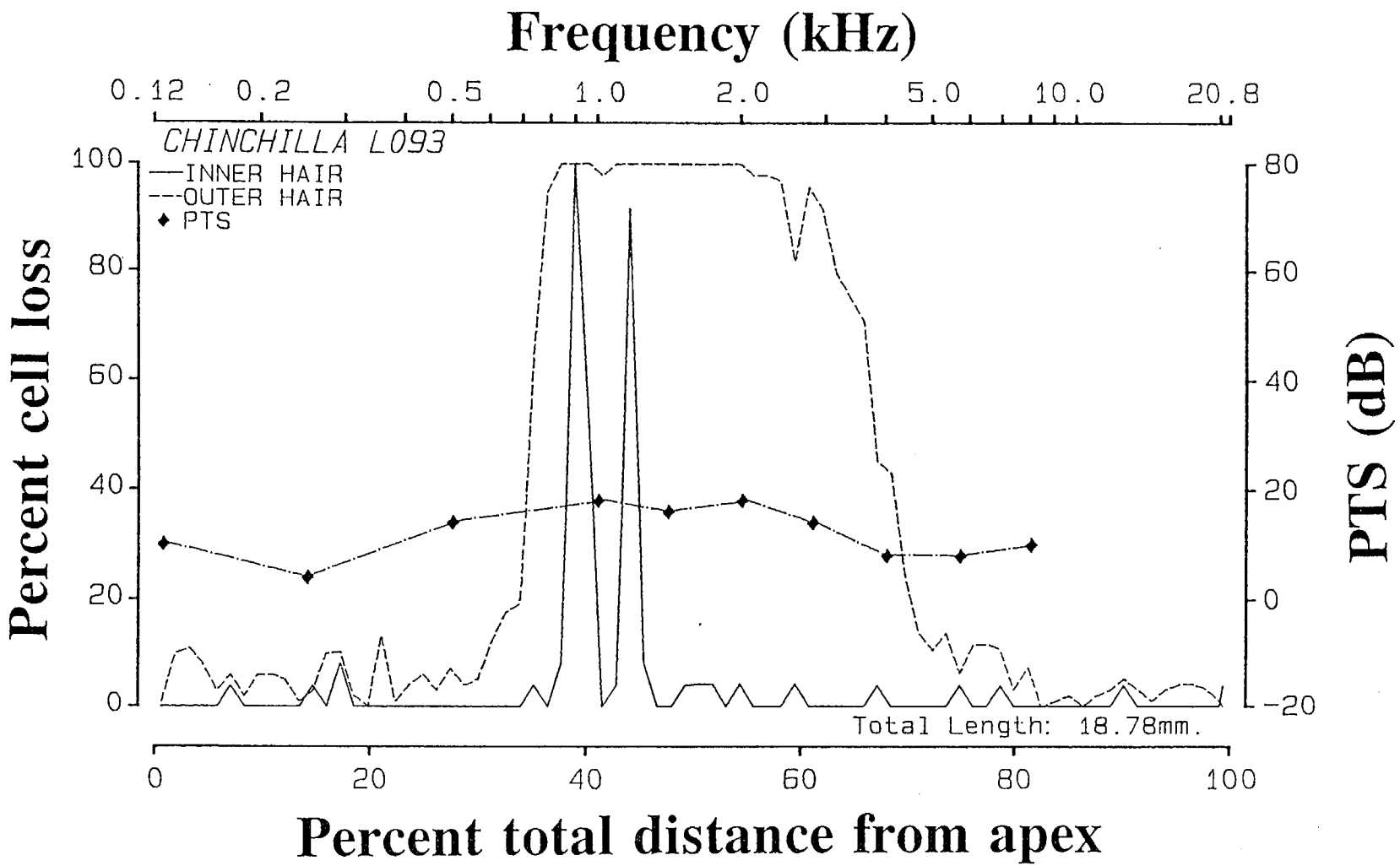
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group standard deviations							
0.125 kHz	1.11	4.56	7.04	7.42	5.04	0.00	0.22
0.25 kHz	0.83	9.31	7.97	8.24	8.31	3.86	7.09
0.5 kHz	1.25	30.74	16.53	3.15	15.53	0.04	0.22
1 kHz	20.67	15.19	14.25	21.66	15.01	20.37	20.29
2 kHz	3.15	41.12	41.20	38.23	38.90	0.13	1.71
4 kHz	1.43	41.16	40.53	36.22	38.97	0.04	0.52
8 kHz	6.00	53.45	53.58	52.18	53.06	4.96	6.37
16 kHz	15.77	50.73	48.97	48.99	49.54	3.32	6.50


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L041
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.17mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L061
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.05mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L090
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 20.16mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L092
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.76mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L093
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.78mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1025 Hz center frequency, 144 dB peak SPL

Animal #		
S65	-	Completed the entire protocol
T010	-	Completed the entire protocol
T013	-	Completed the entire protocol
T014	-	Completed the entire protocol
T016	-	Completed the entire protocol
T025	-	Completed the entire protocol

1025 Hz center frequency, 144 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S65	24.0	9.0	-5.0	-1.0	-4.0	-6.0	2.0	0.0	3.0	10.0
T010	24.0	31.0	38.0	34.0	37.0	34.0	35.0	27.0	23.0	31.0
T013	22.0	7.0	-3.0	-3.0	-4.0	2.0	4.0	0.0	3.0	10.0
T014	25.0	2.0	4.0	2.0	1.0	1.0	3.0	1.0	6.0	3.0
T016	25.0	8.0	0.0	-2.0	-5.0	-1.0	3.0	-1.0	0.0	7.0
T025	27.0	8.0	2.0	2.0	-1.0	1.0	-1.0	-1.0	2.0	1.0
Mean	24.5	10.8	6.0	5.3	4.0	5.2	7.7	4.3	6.2	10.3
S.D.	1.6	10.2	16.0	14.2	16.3	14.4	13.5	11.1	8.5	10.8

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S65	71.0	62.0	60.0	64.0	72.4	69.0	69.0	71.0	68.0	69.0
T010	55.2	74.2	79.2	78.8	80.6	73.2	80.0	66.2	56.4	68.2
T013	79.0	74.0	72.4	73.6	71.0	73.0	69.0	57.0	62.0	59.0
T014	75.4	78.4	68.4	68.4	69.4	71.4	81.4	83.8	82.4	81.8
T016	53.0	58.0	46.0	38.0	45.0	43.0	53.0	45.0	48.0	41.0
T025	54.6	55.6	51.6	50.4	58.6	54.6	56.6	40.6	51.6	52.2
Mean	64.7	67.0	62.9	62.2	66.2	64.0	68.2	60.6	61.4	61.9
S.D.	11.7	9.7	12.7	15.3	12.5	12.4	11.7	16.3	12.5	14.3

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S65	47.0	53.0	65.0	65.0	76.4	75.0	67.0	71.0	65.0	59.0
T010	31.2	43.2	41.2	44.8	43.6	39.2	45.0	39.2	33.4	37.2
T013	57.0	67.0	75.4	76.6	75.0	71.0	65.0	57.0	59.0	49.0
T014	50.4	76.4	64.4	66.4	68.4	70.4	78.4	82.8	76.4	78.8
T016	28.0	50.0	46.0	40.0	50.0	44.0	50.0	46.0	48.0	34.0
T025	27.6	47.6	49.6	48.4	59.6	53.6	57.6	41.6	49.6	51.2
Mean	40.2	56.2	56.9	56.9	62.2	58.9	60.5	56.3	55.2	51.5
S.D.	12.8	12.8	13.3	14.5	13.5	15.3	12.2	17.5	15.0	16.2

Temporary Threshold Shift (dB): 1025 Hz center frequency, 144 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	70.0	70.0	70.0	70.0	70.0	70.0	49.0	38.0	47.0	36.0	45.0	44.0	53.0	52.0	41.0	70.0
T010	41.0	69.0	47.0	55.0	69.0	62.0	40.0	38.0	26.0	43.0	31.0	29.0	27.0	45.0	24.0	69.0
T013	72.0	46.0	45.0	54.0	72.0	72.0	72.0	72.0	51.0	60.0	59.0	38.0	57.0	66.0	65.0	72.0
T014	69.0	69.0	69.0	69.0	69.0	69.0	69.0	50.0	58.0	46.0	53.0	42.0	51.0	59.0	47.0	69.0
T016	64.0	69.0	64.0	69.0	54.0	63.0	52.0	21.0	0.0	9.0	18.0	17.0	26.0	35.0	44.0	69.0
T025	47.0	67.0	62.0	62.0	67.0	67.0	50.0	40.0	40.0	39.0	39.0	28.0	28.0	27.0	16.0	67.0
Mean	60.5	65.0	59.5	63.2	66.8	67.2	55.3	43.2	37.0	38.8	40.8	33.0	40.3	47.3	39.5	69.3
S.D.	13.2	9.4	10.9	7.3	6.5	4.0	12.5	16.9	21.1	16.8	14.9	10.2	14.8	14.7	17.4	1.6

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	86.0	86.0	86.0	86.0	86.0	76.0	55.0	54.0	53.0	52.0	51.0	60.0	49.0	58.0	47.0	86.0
T010	65.0	93.0	71.0	79.0	93.0	86.0	64.0	52.0	70.0	57.0	45.0	43.0	31.0	49.0	48.0	93.0
T013	88.0	72.0	71.0	80.0	88.0	88.0	69.0	68.0	67.0	66.0	65.0	64.0	63.0	72.0	71.0	88.0
T014	93.0	93.0	93.0	93.0	93.0	93.0	93.0	74.0	82.0	70.0	67.0	66.0	75.0	93.0	81.0	93.0
T016	82.0	82.0	74.0	82.0	72.0	71.0	60.0	49.0	28.0	37.0	46.0	45.0	44.0	53.0	62.0	82.0
T025	67.0	76.0	76.0	87.0	87.0	87.0	70.0	60.0	50.0	59.0	39.0	48.0	48.0	47.0	56.0	87.0
Mean	80.2	83.7	78.5	84.5	86.5	83.5	68.5	59.5	58.3	56.8	52.2	54.3	51.7	62.0	60.8	88.2
S.D.	11.6	8.7	9.0	5.2	7.7	8.3	13.3	9.8	18.9	11.6	11.4	10.2	15.4	17.6	13.4	4.3

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	89.0	88.0	97.0	86.0	95.0	94.0	73.0	62.0	61.0	60.0	59.0	68.0	67.0	66.0	65.0	97.0
T010	65.0	83.0	81.0	69.0	93.0	76.0	64.0	62.0	50.0	57.0	45.0	43.0	41.0	39.0	38.0	93.0
T013	77.0	86.0	95.0	94.0	93.0	72.0	83.0	72.0	81.0	80.0	79.0	78.0	69.0	76.0	75.0	95.0
T014	95.0	95.0	95.0	95.0	95.0	95.0	95.0	76.0	74.0	62.0	69.0	68.0	67.0	65.0	53.0	95.0
T016	99.0	77.0	86.0	94.0	84.0	83.0	52.0	31.0	40.0	39.0	38.0	47.0	36.0	55.0	54.0	99.0
T025	67.0	66.0	76.0	85.0	97.0	82.0	60.0	50.0	60.0	59.0	59.0	58.0	28.0	47.0	56.0	97.0
Mean	82.0	82.5	88.3	87.2	92.8	83.7	71.2	58.8	61.0	59.5	58.2	60.3	51.3	58.0	56.8	96.0
S.D.	14.5	10.0	8.7	9.9	4.6	9.3	15.8	16.4	15.1	13.1	15.1	13.5	18.4	13.6	12.4	2.1

Temporary Threshold Shift (dB): 1025 Hz center frequency, 144 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	77.0	86.0	95.0	94.0	83.0	82.0	61.0	60.0	69.0	58.0	57.0	66.0	75.0	64.0	63.0	95.0
T010	71.0	69.0	77.0	85.0	84.0	72.0	71.0	58.0	56.0	63.0	51.0	49.0	37.0	34.0	53.0	85.0
T013	69.0	78.0	87.0	86.0	75.0	84.0	75.0	74.0	73.0	72.0	71.0	80.0	77.0	78.0	77.0	87.0
T014	99.0	99.0	99.0	99.0	99.0	99.0	99.0	70.0	78.0	66.0	73.0	62.0	61.0	69.0	67.0	99.0
T016	92.0	81.0	90.0	89.0	88.0	77.0	56.0	45.0	44.0	43.0	42.0	41.0	50.0	19.0	48.0	92.0
T025	59.0	78.0	68.0	67.0	85.0	88.0	57.0	62.0	52.0	51.0	61.0	50.0	54.0	49.0	28.0	88.0
Mean	77.8	81.8	86.0	86.7	85.7	83.7	69.8	61.5	62.0	58.8	59.2	58.0	59.0	52.2	56.0	91.0
S.D.	15.0	10.1	11.6	11.0	7.8	9.4	16.2	10.1	13.3	10.5	11.8	14.1	15.3	22.5	17.1	5.3

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	79.0	88.0	87.0	96.0	85.0	84.0	73.0	72.0	71.0	70.0	96.0	78.0	67.0	66.0	75.0	96.0
T010	67.0	65.0	83.0	81.0	80.0	58.0	46.0	54.0	52.0	59.0	37.0	45.0	43.0	52.0	41.0	83.0
T013	79.0	88.0	87.0	86.0	85.0	84.0	75.0	74.0	73.0	72.0	71.0	70.0	79.0	78.0	77.0	88.0
T014	99.0	99.0	99.0	99.0	99.0	99.0	99.0	70.0	78.0	66.0	73.0	62.0	71.0	69.0	67.0	99.0
T016	84.0	83.0	82.0	91.0	90.0	79.0	68.0	47.0	56.0	45.0	44.0	53.0	52.0	51.0	50.0	91.0
T025	61.0	70.0	80.0	89.0	96.0	86.0	65.0	64.0	64.0	63.0	83.0	52.0	62.0	51.0	50.0	96.0
Mean	78.2	82.2	86.3	90.3	89.2	81.7	71.0	63.5	65.7	62.5	67.3	60.0	62.3	61.2	60.0	92.2
S.D.	13.3	12.6	6.8	6.6	7.3	13.4	17.2	10.8	10.2	9.8	22.7	12.4	13.1	11.5	15.0	6.0

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	81.0	90.0	99.0	98.0	87.0	86.0	75.0	74.0	83.0	82.0	71.0	80.0	69.0	78.0	77.0	99.0
T010	71.0	69.0	78.0	85.0	84.0	72.0	60.0	58.0	46.0	63.0	41.0	39.0	37.0	45.0	34.0	85.0
T013	63.0	82.0	81.0	70.0	89.0	78.0	69.0	68.0	67.0	66.0	65.0	74.0	73.0	72.0	71.0	89.0
T014	99.0	99.0	99.0	99.0	99.0	99.0	99.0	70.0	78.0	66.0	63.0	72.0	71.0	79.0	67.0	99.0
T016	90.0	89.0	78.0	87.0	86.0	85.0	101.0	53.0	32.0	51.0	30.0	39.0	48.0	47.0	56.0	101.0
T025	59.0	78.0	78.0	67.0	85.0	94.0	62.0	72.0	52.0	61.0	61.0	50.0	60.0	49.0	48.0	94.0
Mean	77.2	84.5	85.5	84.3	88.3	85.7	77.7	65.8	59.7	64.8	55.2	59.0	59.7	61.7	58.8	94.5
S.D.	15.6	10.5	10.5	13.5	5.5	9.9	18.1	8.4	19.7	10.1	16.0	18.5	14.4	16.3	16.0	6.4

Temporary Threshold Shift (dB): 1025 Hz center frequency, 144 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	73.0	82.0	91.0	90.0	79.0	78.0	67.0	66.0	65.0	54.0	73.0	72.0	71.0	60.0	59.0	91.0
T010	49.0	77.0	75.0	73.0	82.0	70.0	58.0	56.0	54.0	61.0	49.0	47.0	35.0	43.0	51.0	82.0
T013	81.0	80.0	69.0	68.0	77.0	76.0	57.0	56.0	65.0	64.0	63.0	62.0	71.0	60.0	69.0	81.0
T014	97.0	97.0	97.0	97.0	97.0	97.0	97.0	68.0	76.0	64.0	71.0	80.0	69.0	97.0	75.0	97.0
T016	76.0	97.0	97.0	73.0	82.0	71.0	60.0	49.0	38.0	57.0	56.0	35.0	34.0	53.0	72.0	97.0
T025	61.0	80.0	70.0	79.0	77.0	86.0	75.0	64.0	54.0	43.0	43.0	62.0	52.0	71.0	60.0	86.0
Mean	72.8	85.5	83.2	80.0	82.3	79.7	69.0	59.8	58.7	57.2	59.2	59.7	55.3	64.0	64.3	89.0
S.D.	16.5	9.1	13.3	11.2	7.5	10.3	15.3	7.3	13.1	8.0	12.0	16.4	17.6	18.6	9.2	7.1

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	75.0	84.0	83.0	82.0	71.0	70.0	59.0	58.0	67.0	66.0	65.0	74.0	73.0	72.0	71.0	84.0
T010	71.0	59.0	67.0	65.0	74.0	62.0	60.0	58.0	56.0	53.0	41.0	29.0	27.0	45.0	54.0	74.0
T013	75.0	64.0	63.0	62.0	71.0	70.0	61.0	50.0	59.0	68.0	57.0	56.0	55.0	54.0	63.0	75.0
T014	99.0	99.0	99.0	99.0	99.0	99.0	99.0	60.0	88.0	66.0	73.0	72.0	71.0	99.0	99.0	99.0
T016	60.0	69.0	88.0	96.0	76.0	65.0	64.0	53.0	42.0	41.0	50.0	49.0	38.0	47.0	46.0	96.0
T025	61.0	70.0	70.0	59.0	77.0	76.0	64.0	74.0	44.0	53.0	23.0	52.0	42.0	51.0	40.0	77.0
Mean	73.5	74.2	78.3	77.2	78.0	73.7	67.8	58.8	59.3	57.8	51.5	55.3	51.0	61.3	62.2	84.2
S.D.	14.1	14.8	14.0	17.7	10.6	13.3	15.4	8.3	16.9	10.6	17.9	16.6	18.6	20.8	21.2	10.9

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	71.0	70.0	59.0	78.0	77.0	66.0	55.0	64.0	63.0	52.0	71.0	70.0	59.0	58.0	67.0	78.0
T010	57.0	65.0	73.0	71.0	70.0	63.0	46.0	54.0	52.0	59.0	37.0	25.0	23.0	41.0	41.0	73.0
T013	71.0	70.0	69.0	68.0	77.0	76.0	57.0	56.0	55.0	54.0	63.0	62.0	51.0	60.0	59.0	77.0
T014	93.0	93.0	93.0	93.0	93.0	93.0	93.0	64.0	72.0	50.0	57.0	76.0	75.0	93.0	81.0	93.0
T016	78.0	99.0	76.0	85.0	74.0	73.0	52.0	61.0	60.0	49.0	48.0	47.0	46.0	45.0	54.0	99.0
T025	57.0	66.0	56.0	65.0	83.0	82.0	61.0	60.0	40.0	59.0	39.0	58.0	48.0	57.0	46.0	83.0
Mean	71.2	77.2	71.0	76.7	79.0	75.5	60.7	59.8	57.0	53.8	52.5	56.3	50.3	59.0	58.0	83.8
S.D.	13.6	14.9	13.3	10.8	8.1	11.0	16.6	4.1	10.8	4.4	13.5	18.3	17.1	18.3	14.6	10.1

Temporary Threshold Shift (dB): 1025 Hz center frequency, 144 dB peak SPL

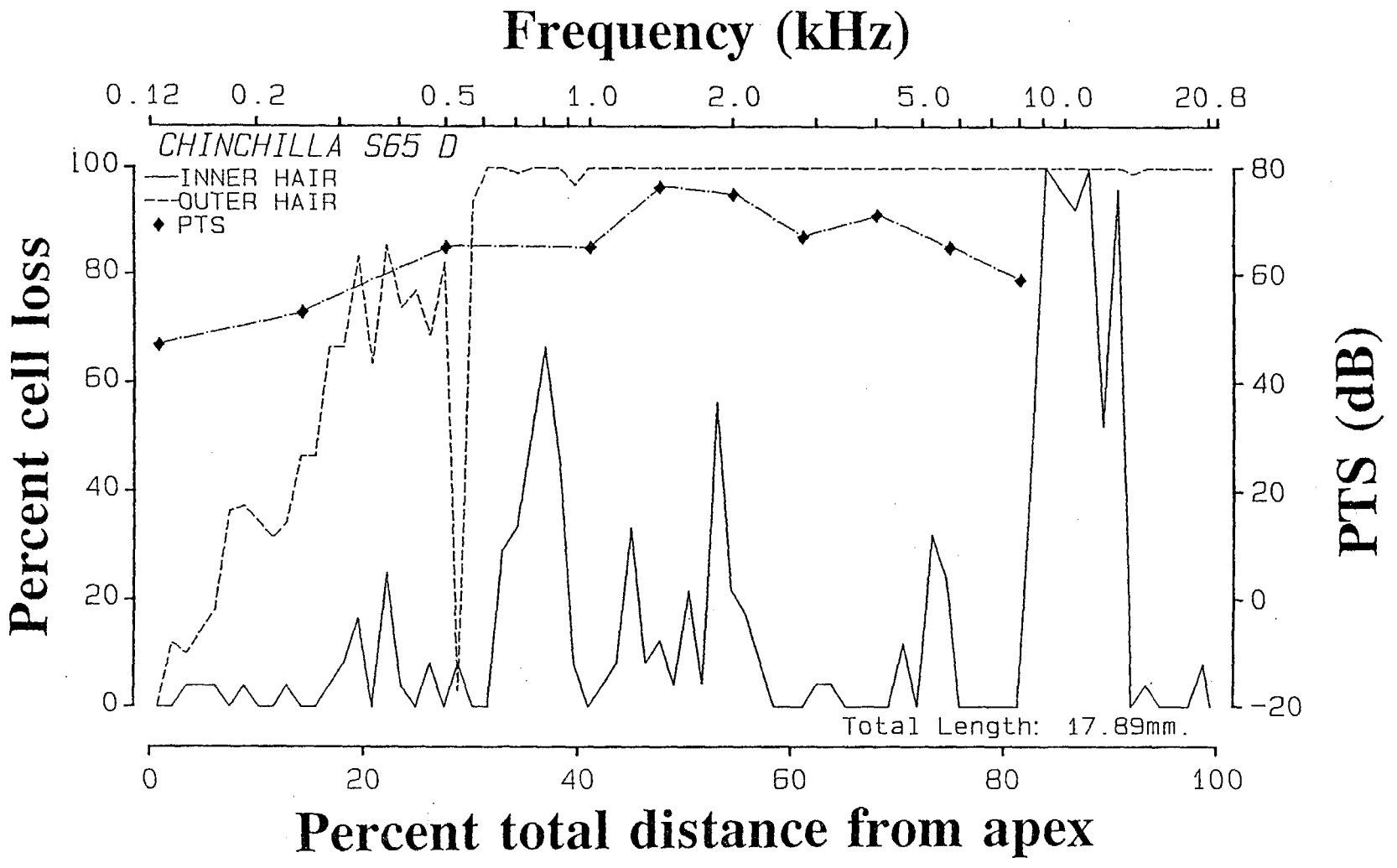
Frequency 8.000 kHz

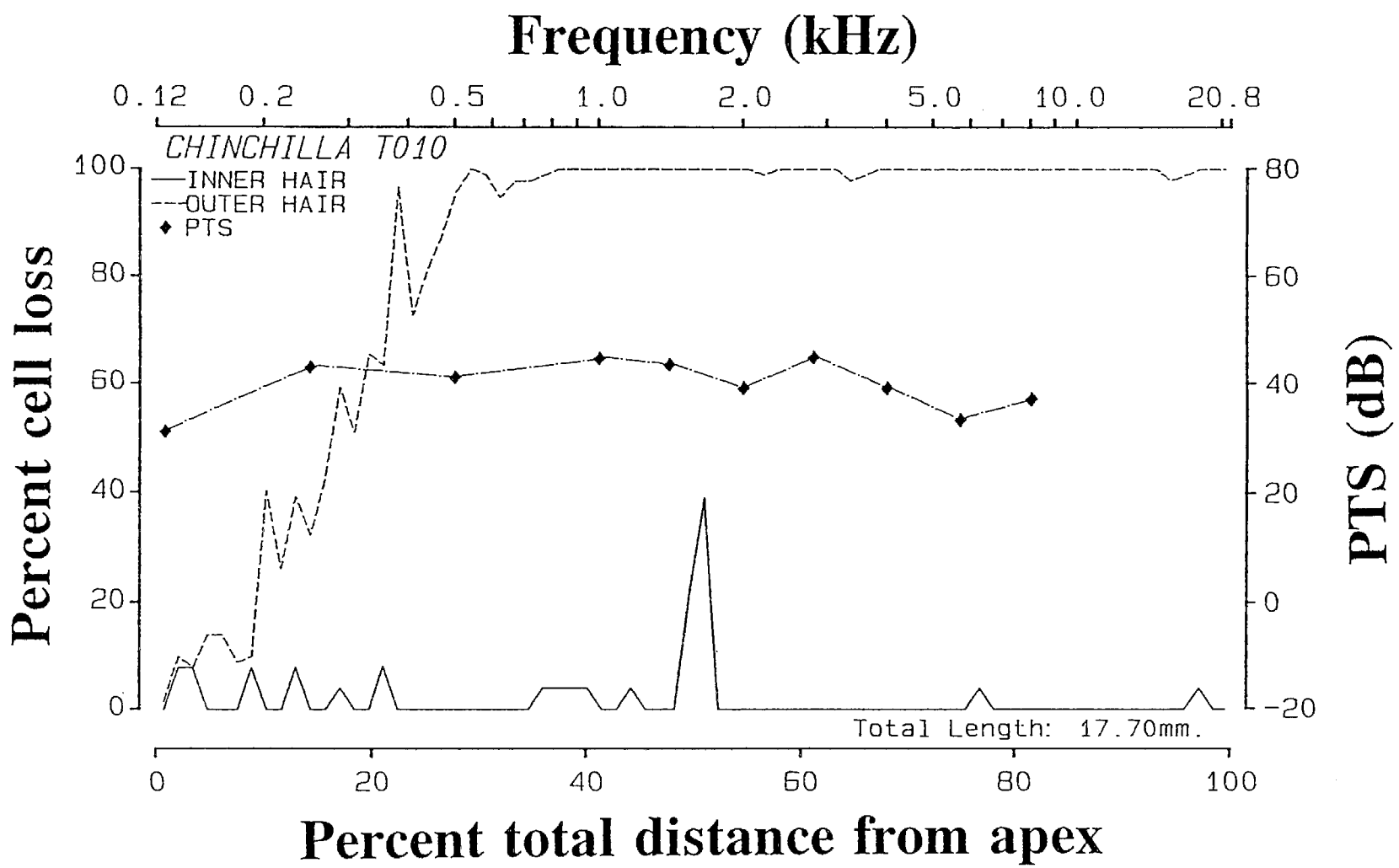
Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S65	69.0	68.0	77.0	66.0	75.0	64.0	53.0	52.0	51.0	50.0	59.0	68.0	57.0	56.0	55.0	77.0
T010	75.0	73.0	71.0	59.0	68.0	56.0	64.0	62.0	60.0	57.0	35.0	33.0	31.0	39.0	48.0	75.0
T013	84.0	58.0	77.0	56.0	65.0	64.0	45.0	54.0	53.0	52.0	51.0	50.0	49.0	48.0	47.0	84.0
T014	91.0	91.0	91.0	91.0	91.0	91.0	91.0	72.0	80.0	68.0	65.0	74.0	73.0	91.0	91.0	91.0
T016	56.0	87.0	87.0	73.0	62.0	61.0	80.0	19.0	18.0	27.0	36.0	25.0	24.0	43.0	42.0	87.0
T025	63.0	62.0	72.0	71.0	79.0	78.0	56.0	56.0	56.0	55.0	55.0	54.0	44.0	43.0	60.0	79.0
Mean	73.0	73.2	79.2	69.3	73.3	69.0	64.8	52.5	53.0	51.5	50.2	50.7	46.3	53.3	57.2	82.2
S.D.	13.1	13.4	8.1	12.5	10.7	13.0	17.5	17.9	20.1	13.6	12.3	19.1	17.7	19.4	17.8	6.2

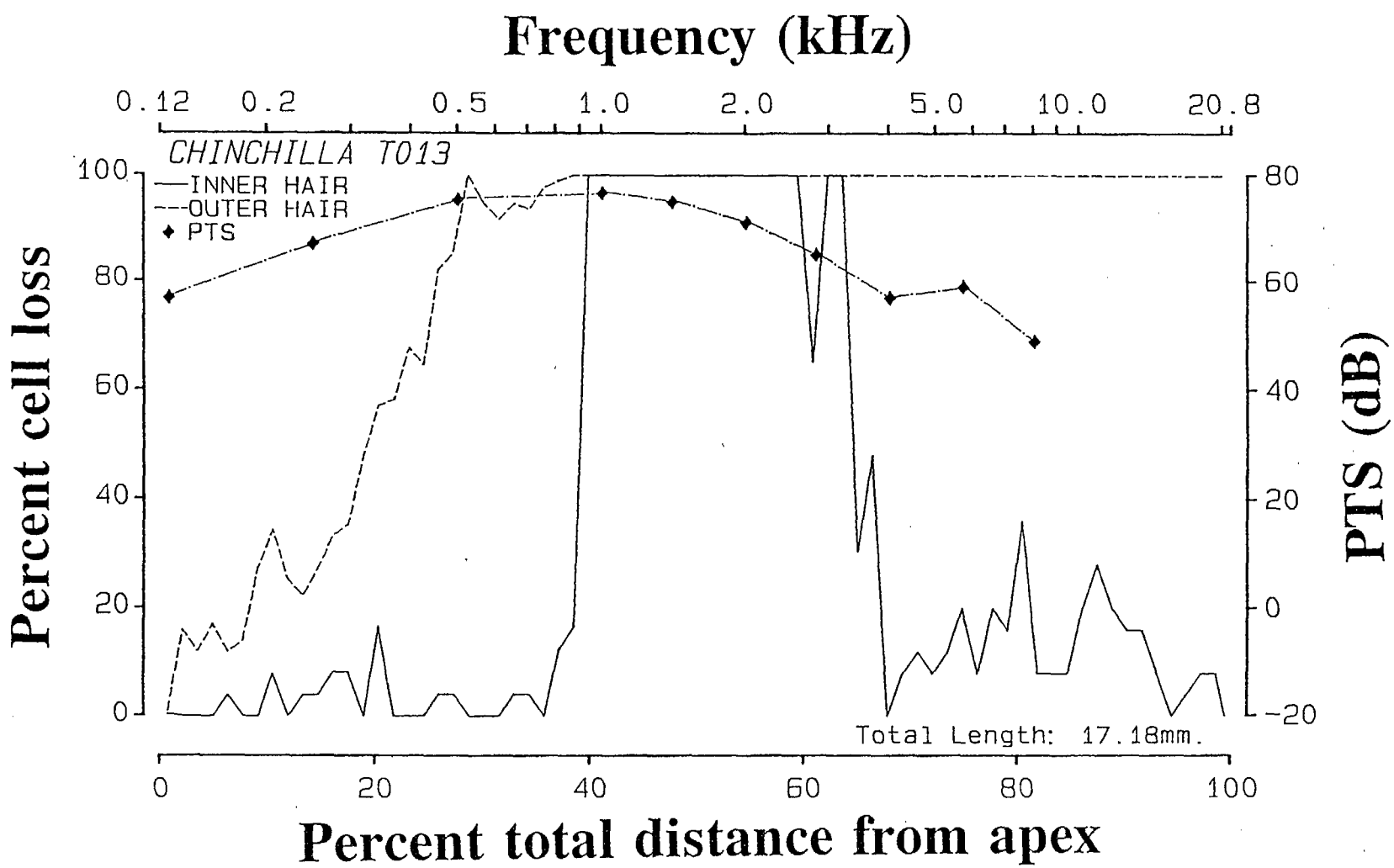
1025 Hz center frequency, 144 dB peak SPL

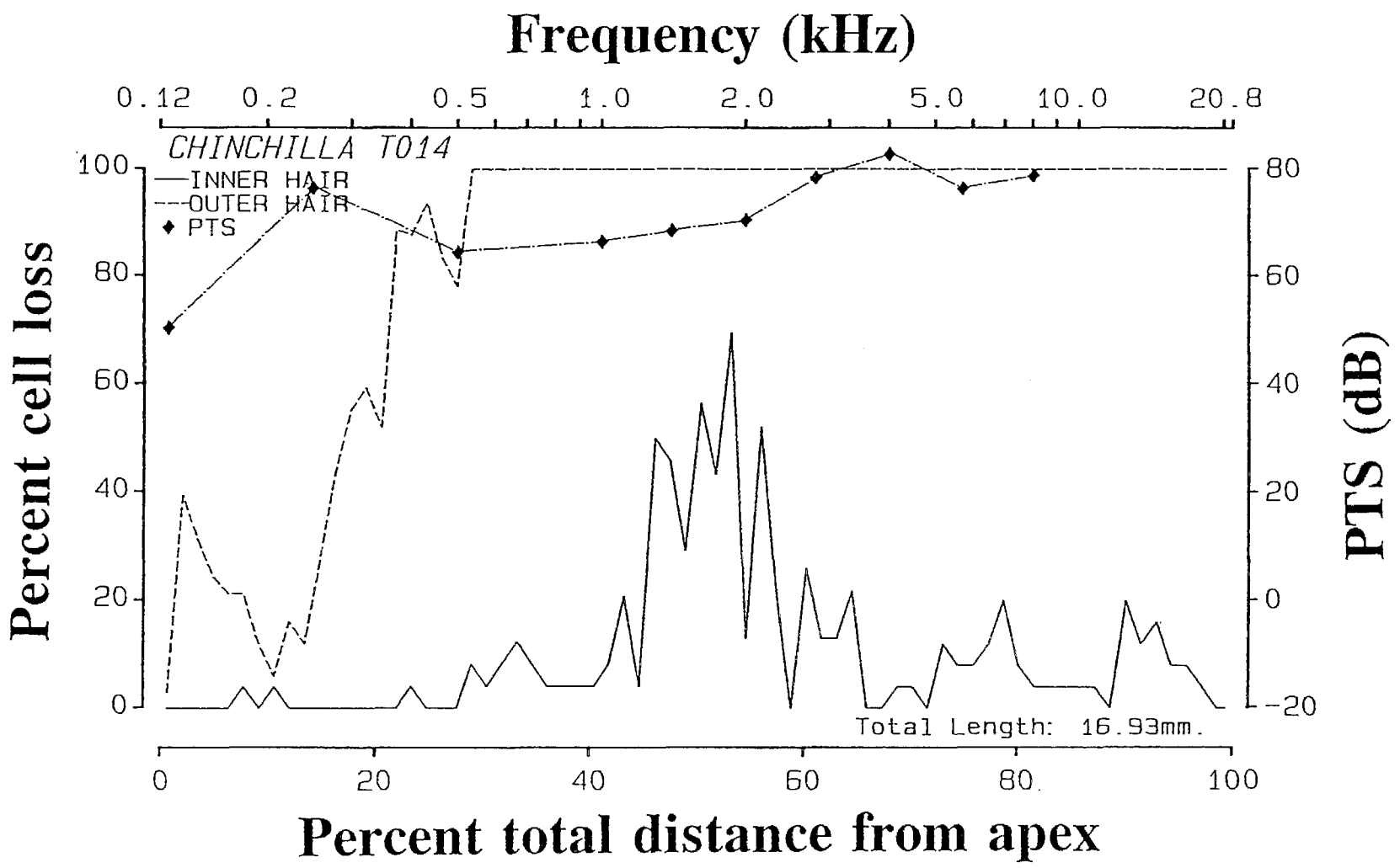
Percent sensory cell losses over octave band frequencies

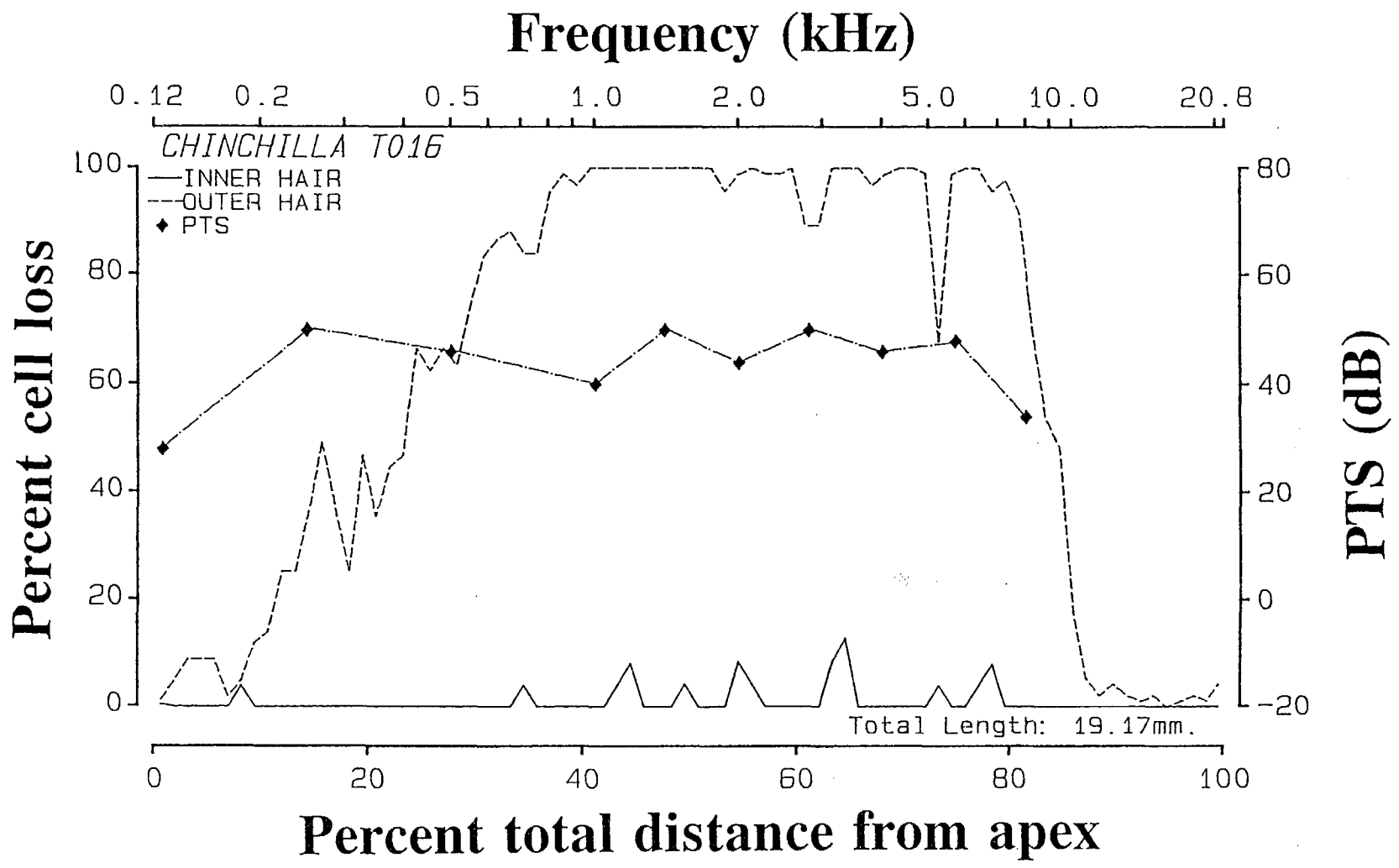
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	6.60	10.17	15.57	24.40	16.71	0.00	0.53
0.25 kHz	10.75	52.50	35.60	25.12	37.74	0.35	1.02
0.5 kHz	9.85	91.92	86.95	66.45	81.77	1.35	15.82
1 kHz	24.93	99.93	99.68	97.38	99.00	21.13	58.95
2 kHz	31.53	100.00	99.77	97.73	99.17	19.53	56.25
4 kHz	11.82	100.00	99.80	97.35	99.05	3.25	14.48
8 kHz	11.23	92.42	96.22	95.42	94.68	7.98	9.58
16 kHz	8.02	83.58	83.65	83.53	83.59	1.88	5.65
Group standard deviations							
0.125 kHz	12.73	6.13	10.49	13.79	7.92	0.00	1.08
0.25 kHz	20.52	12.69	14.31	8.63	9.33	0.81	1.34
0.5 kHz	17.06	5.52	8.63	16.03	8.89	3.02	14.98
1 kHz	25.09	0.16	0.27	3.76	1.27	21.74	23.59
2 kHz	35.34	0.00	0.57	3.77	1.43	25.45	39.49
4 kHz	13.31	0.00	0.49	5.35	1.95	3.15	16.02
8 kHz	15.34	18.38	9.27	11.23	12.96	17.42	17.01
16 kHz	7.97	40.02	40.05	39.80	39.95	4.52	8.38

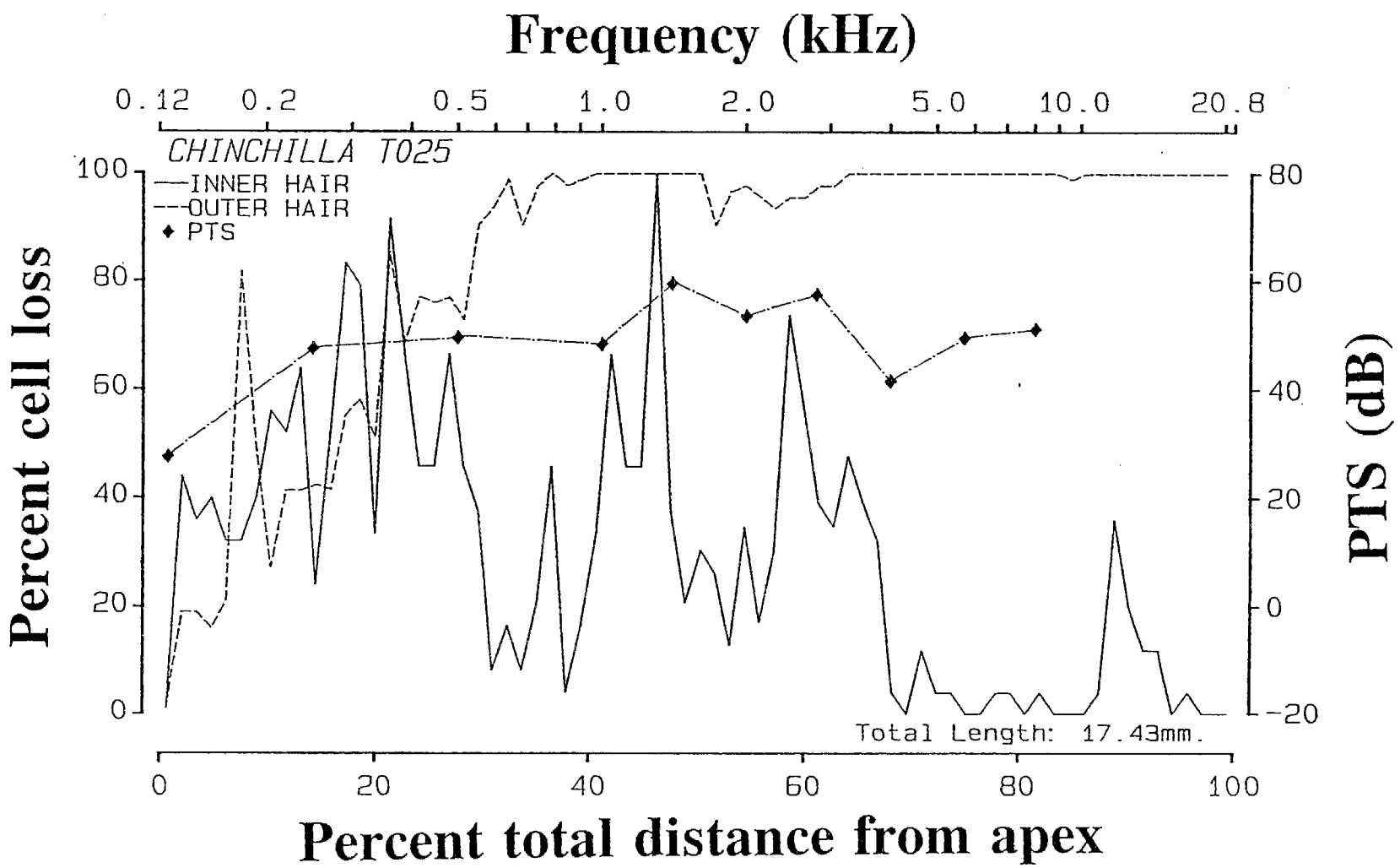

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S65 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.89mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T010
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.70mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T013
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.18mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T014
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.93mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T016
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.17mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T025
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.43mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1350 Hz center frequency, 129 dB peak SPL

Animal #		
L031	-	Completed the entire protocol
L047R	-	Completed the entire protocol
L051R	-	Completed the entire protocol
L069R	-	Completed the entire protocol
L093R	-	Completed the entire protocol
L095R	-	Completed the entire protocol

1350 Hz center frequency, 129 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L031	21.0	8.0	7.0	6.0	3.0	2.0	3.0	6.0	6.0	0.0
L047R	25.0	6.0	1.0	2.0	1.0	0.0	1.0	0.0	2.0	4.0
L051R	22.0	10.0	0.0	0.0	4.0	-2.0	3.0	0.0	3.0	6.0
L069R	27.0	8.0	-3.0	4.0	1.0	-4.0	3.0	2.0	-2.0	4.0
L093R	24.0	11.0	4.0	1.0	0.0	3.0	2.0	5.0	1.0	3.0
L095R	23.0	8.0	7.0	6.0	5.0	6.0	3.0	2.0	2.0	2.0
Mean	23.7	8.5	2.7	3.2	2.3	0.8	2.5	2.5	2.0	3.2
S.D.	2.2	1.8	4.0	2.6	2.0	3.6	0.8	2.5	2.6	2.0

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L031	25.0	10.0	5.0	4.0	5.0	6.0	3.0	0.0	4.0	2.0
L047R	39.2	20.2	19.2	22.0	17.0	24.2	23.2	28.2	16.2	18.2
L051R	26.8	10.8	2.8	4.8	2.8	0.8	3.8	6.8	5.8	0.8
L069R	38.0	17.0	8.0	25.0	18.0	17.0	13.0	19.0	16.6	17.0
L093R	32.0	13.0	2.0	7.0	10.0	13.0	6.0	13.0	11.0	13.0
L095R	23.0	10.0	7.0	2.0	5.0	4.0	1.0	0.0	6.0	4.0
Mean	30.7	13.5	7.3	10.8	9.6	10.8	8.3	11.2	9.9	9.2
S.D.	6.8	4.2	6.3	10.0	6.5	8.9	8.4	11.2	5.5	7.8

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
L031	4.0	2.0	-2.0	-2.0	2.0	4.0	0.0	-6.0	-2.0	2.0
L047R	14.2	14.2	18.2	20.0	16.0	24.2	22.2	28.2	14.2	14.2
L051R	4.8	0.8	2.8	4.8	-1.2	2.8	0.8	6.8	2.8	-5.2
L069R	11.0	9.0	11.0	21.0	17.0	21.0	10.0	17.0	18.6	13.0
L093R	8.0	2.0	-2.0	6.0	10.0	10.0	4.0	8.0	10.0	10.0
L095R	0.0	2.0	0.0	-4.0	0.0	-2.0	-2.0	-2.0	4.0	2.0
Mean	7.0	5.0	4.7	7.6	7.3	10.0	5.8	8.7	7.9	6.0
S.D.	5.1	5.4	8.2	10.7	8.1	10.5	9.1	12.5	7.7	7.6

Temporary Threshold Shift (dB): 1350 Hz center frequency, 129 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	20.0	28.0	16.0	4.0	2.0	10.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	28.0
L047R	20.0	29.0	18.0	27.0	16.0	16.0	14.0	11.0	9.0	18.0	17.0	15.0	14.0	13.0	12.0	29.0
L051R	2.0	10.0	8.0	6.0	4.0	9.0	7.0	3.0	1.0	-1.0	7.0	5.0	3.0	2.0	7.0	10.0
L069R	18.0	17.0	16.0	16.0	14.0	14.0	13.0	13.0	17.0	16.0	-5.0	14.0	13.0	22.0	11.0	22.0
L093R	10.0	18.0	16.0	24.0	2.0	1.0	9.0	11.0	9.0	6.0	4.0	10.0	8.0	7.0	11.0	24.0
L095R	26.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	26.0
Mean	16.0	17.7	12.7	12.8	6.0	9.3	9.2	7.7	6.7	6.5	3.2	9.3	7.7	8.0	6.8	23.2
S.D.	8.6	9.8	6.3	11.2	7.3	5.4	3.8	4.6	6.3	8.6	8.2	4.6	5.0	8.2	5.7	6.9

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	24.0	22.0	30.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	30.0
L047R	40.0	29.0	38.0	27.0	25.0	26.0	14.0	1.0	9.0	18.0	27.0	25.0	4.0	13.0	2.0	40.0
L051R	6.0	4.0	2.0	0.0	-2.0	3.0	1.0	-3.0	5.0	3.0	1.0	-1.0	-3.0	6.0	1.0	6.0
L069R	18.0	27.0	16.0	15.0	24.0	44.0	17.0	23.0	27.0	16.0	25.0	14.0	3.0	2.0	1.0	44.0
L093R	4.0	32.0	50.0	48.0	26.0	5.0	3.0	5.0	13.0	0.0	-2.0	4.0	2.0	1.0	5.0	50.0
L095R	12.0	10.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	12.0
Mean	17.3	20.7	24.0	17.3	13.8	14.0	6.2	5.7	11.3	7.8	9.5	7.3	0.7	4.3	3.2	30.3
S.D.	13.4	11.2	18.5	17.6	12.5	17.3	7.4	9.3	8.2	7.4	12.9	10.2	2.8	5.2	2.1	17.9

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	12.0	10.0	18.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	18.0
L047R	12.0	31.0	40.0	29.0	18.0	18.0	6.0	23.0	11.0	10.0	29.0	27.0	6.0	15.0	14.0	40.0
L051R	12.0	0.0	8.0	6.0	14.0	-1.0	-3.0	3.0	1.0	-1.0	-3.0	5.0	3.0	2.0	7.0	14.0
L069R	26.0	15.0	24.0	33.0	32.0	2.0	1.0	21.0	35.0	24.0	13.0	12.0	11.0	10.0	9.0	35.0
L093R	8.0	56.0	64.0	62.0	30.0	9.0	17.0	19.0	17.0	4.0	2.0	-2.0	-4.0	-5.0	-1.0	64.0
L095R	30.0	18.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	12.0	30.0
Mean	16.7	21.7	26.7	23.3	16.7	5.0	3.2	10.0	10.7	5.5	7.2	6.7	1.7	2.0	5.8	33.5
S.D.	9.0	19.6	22.0	22.8	12.6	7.3	7.5	12.3	14.0	10.5	12.0	11.3	6.1	8.7	7.8	17.9

Temporary Threshold Shift (dB): 1350 Hz center frequency, 129 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	18.0	6.0	24.0	12.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	24.0
L047R	46.0	25.0	33.0	43.0	22.0	32.0	20.0	17.0	5.0	24.0	32.0	41.0	0.0	9.0	18.0	46.0
L051R	6.0	4.0	2.0	10.0	-2.0	3.0	1.0	-3.0	5.0	3.0	1.0	9.0	7.0	6.0	1.0	10.0
L069R	24.0	23.0	22.0	31.0	20.0	20.0	-1.0	19.0	33.0	22.0	21.0	20.0	19.0	28.0	17.0	33.0
L093R	46.0	64.0	62.0	60.0	28.0	27.0	15.0	17.0	15.0	12.0	0.0	6.0	4.0	13.0	7.0	64.0
L095R	16.0	14.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	-10.0	-2.0	16.0
Mean	26.0	22.7	25.8	27.7	12.7	14.3	7.5	9.3	10.0	9.8	8.0	11.0	4.3	8.0	6.8	32.2
S.D.	16.5	22.0	20.7	20.8	12.4	13.9	8.3	9.4	12.4	11.3	14.9	17.5	8.4	12.6	8.8	20.1

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	8.0	6.0	14.0	12.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	14.0
L047R	44.0	33.0	32.0	31.0	20.0	40.0	18.0	15.0	13.0	22.0	30.0	19.0	8.0	7.0	16.0	44.0
L051R	10.0	8.0	6.0	4.0	2.0	-3.0	5.0	1.0	-1.0	7.0	-5.0	3.0	1.0	0.0	-5.0	10.0
L069R	34.0	33.0	22.0	21.0	30.0	30.0	-1.0	9.0	23.0	12.0	31.0	10.0	9.0	18.0	17.0	34.0
L093R	34.0	62.0	60.0	48.0	46.0	15.0	23.0	25.0	13.0	0.0	8.0	4.0	12.0	11.0	15.0	62.0
L095R	14.0	12.0	10.0	-2.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	14.0
Mean	24.0	25.7	24.0	19.0	17.3	15.7	8.8	9.0	8.0	6.2	11.0	7.3	5.7	6.0	6.5	29.7
S.D.	15.2	21.5	19.9	18.5	18.2	16.4	9.5	9.6	9.9	9.6	15.8	6.4	4.8	7.6	10.6	20.7

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	20.0	8.0	26.0	14.0	12.0	10.0	-2.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	26.0
L047R	46.0	35.0	34.0	43.0	22.0	52.0	20.0	27.0	35.0	54.0	53.0	21.0	20.0	9.0	18.0	54.0
L051R	8.0	16.0	14.0	12.0	0.0	5.0	3.0	9.0	7.0	5.0	3.0	1.0	-1.0	8.0	3.0	16.0
L069R	50.0	19.0	18.0	57.0	36.0	46.0	5.0	15.0	39.0	28.0	27.0	16.0	25.0	24.0	13.0	57.0
L093R	42.0	60.0	58.0	56.0	14.0	33.0	41.0	13.0	21.0	-2.0	6.0	12.0	10.0	9.0	13.0	60.0
L095R	14.0	12.0	10.0	-2.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	14.0
Mean	30.0	25.0	26.7	30.0	15.0	25.0	11.5	11.7	17.3	13.8	13.8	10.0	10.0	8.7	7.5	37.8
S.D.	18.1	19.5	17.6	25.2	12.7	21.5	16.3	9.2	17.0	22.8	22.2	7.9	10.6	8.6	8.4	21.5

Temporary Threshold Shift (dB): 1350 Hz center frequency, 129 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	28.0	6.0	24.0	12.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	28.0
L047R	54.0	33.0	42.0	51.0	30.0	50.0	18.0	15.0	3.0	12.0	31.0	29.0	28.0	7.0	16.0	54.0
L051R	12.0	10.0	8.0	6.0	14.0	-1.0	7.0	3.0	1.0	-1.0	-3.0	5.0	3.0	2.0	-3.0	14.0
L069R	42.0	11.0	20.0	19.0	28.0	48.0	7.0	17.0	25.0	20.0	9.0	18.0	2.0	16.0	5.0	48.0
L093R	32.0	60.0	58.0	36.0	24.0	33.0	11.0	13.0	21.0	8.0	6.0	2.0	0.0	9.0	3.0	60.0
L095R	6.0	4.0	12.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	-6.0	-8.0	0.0	-2.0	12.0
Mean	29.0	20.7	27.3	20.7	17.3	22.3	7.2	9.0	8.7	6.2	7.8	7.3	4.8	6.0	3.2	36.0
S.D.	18.0	21.9	19.1	19.4	12.0	24.3	7.3	6.7	11.2	8.8	12.3	13.6	12.1	6.0	7.0	20.8

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	14.0	2.0	10.0	8.0	6.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	-8.0	-10.0	-2.0	-4.0	14.0
L047R	34.0	33.0	52.0	51.0	20.0	50.0	28.0	25.0	13.0	12.0	41.0	29.0	28.0	17.0	26.0	52.0
L051R	44.0	12.0	20.0	8.0	6.0	11.0	-1.0	5.0	3.0	11.0	9.0	7.0	5.0	4.0	9.0	44.0
L069R	22.0	11.0	20.0	19.0	8.0	8.0	7.0	17.0	31.0	20.0	19.0	28.0	7.0	16.0	15.0	31.0
L093R	18.0	56.0	34.0	52.0	20.0	9.0	7.0	9.0	7.0	14.0	12.0	18.0	6.0	5.0	-1.0	56.0
L095R	6.0	4.0	12.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	12.0
Mean	23.0	19.7	24.7	23.0	11.3	13.0	7.8	9.7	8.7	8.5	11.8	11.3	6.3	6.7	7.2	34.8
S.D.	13.8	20.9	15.8	22.9	6.8	19.1	10.3	9.6	12.2	9.5	17.2	16.3	12.3	8.0	11.8	19.0

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	14.0	2.0	20.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	-10.0	-2.0	6.0	20.0
L047R	42.0	31.0	40.0	29.0	38.0	18.0	26.0	13.0	11.0	10.0	29.0	17.0	6.0	15.0	4.0	42.0
L051R	40.0	18.0	16.0	4.0	2.0	-3.0	5.0	1.0	-1.0	-3.0	5.0	3.0	1.0	0.0	5.0	40.0
L069R	36.0	25.0	24.0	23.0	32.0	42.0	1.0	21.0	29.0	24.0	23.0	22.0	11.0	20.0	17.0	42.0
L093R	42.0	60.0	58.0	56.0	34.0	13.0	11.0	23.0	11.0	8.0	6.0	12.0	10.0	9.0	13.0	60.0
L095R	6.0	4.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	8.0	12.0
Mean	30.0	23.3	28.3	21.7	20.0	13.3	8.2	10.0	8.0	7.2	10.5	10.0	3.3	7.0	8.8	36.0
S.D.	15.9	21.3	17.5	19.3	16.3	15.8	9.4	10.4	11.9	10.2	13.0	8.3	7.7	9.1	5.1	17.3

Temporary Threshold Shift (dB): 1350 Hz center frequency, 129 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
L031	16.0	4.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	16.0
L047R	60.0	29.0	18.0	43.0	22.0	22.0	20.0	7.0	35.0	14.0	17.0	15.0	14.0	13.0	12.0	60.0
L051R	18.0	6.0	14.0	12.0	0.0	-5.0	3.0	-1.0	-3.0	-5.0	-7.0	-9.0	-1.0	-2.0	-7.0	18.0
L069R	26.0	15.0	4.0	23.0	22.0	32.0	11.0	11.0	45.0	14.0	33.0	12.0	11.0	10.0	-1.0	45.0
L093R	26.0	54.0	32.0	50.0	18.0	37.0	5.0	7.0	5.0	2.0	10.0	16.0	14.0	3.0	7.0	54.0
L095R	2.0	0.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	8.0
Mean	24.7	18.0	14.7	24.0	12.3	15.7	7.2	5.7	14.7	6.2	10.2	6.3	6.3	5.0	2.2	33.5
S.D.	19.4	20.5	9.8	18.5	9.6	17.1	7.3	4.4	20.1	7.4	13.8	9.8	7.5	5.8	6.8	22.1

1350 Hz center frequency, 129 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
L031	11	45	37	47	129
L047R	12	49	52	97	198
L051R	7	90	213	341	644
L069R	33	119	202	448	769
L093R	55	63	86	173	322
L095R	37	132	120	147	399
Group mean	26				410
S.D.	19				251
S.E.	8				103

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.7	126.8
	0.25 kHz	1.8	106.5
	0.5 kHz	0.8	38.3
	1 kHz	7.7	88.8
	2 kHz	1.2	21.2
	4 kHz	1.3	5.5
	8 kHz	8.0	17.2
	16 kHz	3.3	5.8
Standard deviations			
	0.125 kHz	1.4	99.9
	0.25 kHz	1.0	123.6
	0.5 kHz	1.0	27.7
	1 kHz	12.7	111.2
	2 kHz	1.9	28.5
	4 kHz	1.9	3.2
	8 kHz	16.3	27.0
	16 kHz	5.4	3.7

1350 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L031							
0.125 kHz	1	11	17	17	45	0	2
0.25 kHz	1	9	6	6	21	1	1
0.5 kHz	2	5	0	6	11	0	0
1 kHz	1	7	3	3	13	0	0
2 kHz	0	1	5	3	9	0	0
4 kHz	1	3	1	3	7	0	0
8 kHz	5	7	3	7	17	0	0
16 kHz	0	2	2	2	6	0	0
TOTALS	11	45	37	47	129	1	3
Chinchilla L047R							
0.125 kHz	4	7	11	29	47	0	0
0.25 kHz	2	4	2	19	25	0	0
0.5 kHz	0	5	5	10	20	0	0
1 kHz	0	2	1	8	11	0	0
2 kHz	5	27	28	23	78	1	4
4 kHz	1	2	3	2	7	0	1
8 kHz	0	0	0	3	3	0	0
16 kHz	0	2	2	3	7	0	0
TOTALS	12	49	52	97	198	1	5
Chinchilla L051R							
0.125 kHz	2	39	98	95	232	0	2
0.25 kHz	1	37	77	194	308	0	1
0.5 kHz	0	4	15	34	53	0	0
1 kHz	0	5	14	13	32	0	0
2 kHz	1	0	6	2	8	0	0
4 kHz	0	0	1	0	1	0	0
8 kHz	2	3	2	3	8	0	1
16 kHz	1	2	0	0	2	0	0
TOTALS	7	90	213	341	644	0	4

1350 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L069R							
0.125 kHz	0	47	102	120	269	0	0
0.25 kHz	3	9	32	171	212	0	0
0.5 kHz	1	1	4	82	87	0	0
1 kHz	14	56	58	64	178	31	26
2 kHz	0	6	4	9	19	0	4
4 kHz	1	0	1	1	2	0	0
8 kHz	0	0	0	0	0	0	0
16 kHz	14	0	1	1	2	0	0
TOTALS	33	119	202	448	769	31	30
Chinchilla L093R							
0.125 kHz	2	6	33	76	115	0	1
0.25 kHz	1	14	9	34	57	0	0
0.5 kHz	2	3	11	13	27	0	0
1 kHz	0	3	6	15	24	0	0
2 kHz	1	3	3	7	13	0	0
4 kHz	5	1	1	7	9	0	0
8 kHz	41	29	21	21	71	9	14
16 kHz	3	4	2	0	6	0	0
TOTALS	55	63	86	173	322	9	15
Chinchilla L095R							
0.125 kHz	1	5	16	32	53	0	0
0.25 kHz	3	3	2	11	16	0	0
0.5 kHz	0	23	6	3	32	0	0
1 kHz	31	93	90	92	275	68	60
2 kHz	0	0	0	0	0	0	0
4 kHz	0	5	0	2	7	0	0
8 kHz	0	1	2	1	4	0	0
16 kHz	2	2	4	6	12	0	0
TOTALS	37	132	120	147	399	68	60

1350 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.7	19.2	46.2	61.5	126.8	0.0	0.8
0.25 kHz	1.8	12.7	21.3	72.5	106.5	0.2	0.3
0.5 kHz	0.8	6.8	6.8	24.7	38.3	0.0	0.0
1 kHz	7.7	27.7	28.7	32.5	88.8	16.5	14.3
2 kHz	1.2	6.2	7.7	7.3	21.2	0.2	1.3
4 kHz	1.3	1.8	1.2	2.5	5.5	0.0	0.2
8 kHz	8.0	6.7	4.7	5.8	17.2	1.5	2.5
16 kHz	3.3	2.0	1.8	2.0	5.8	0.0	0.0
TOTALS	25.8	83.0	118.3	208.8	410.2	18.3	19.5
Group standard deviations							
0.125 kHz	1.4	18.7	42.4	41.6	99.9	0.0	1.0
0.25 kHz	1.0	12.6	29.5	86.0	123.6	0.4	0.5
0.5 kHz	1.0	8.1	5.3	30.1	27.7	0.0	0.0
1 kHz	12.7	38.2	36.8	36.6	111.2	28.1	24.7
2 kHz	1.9	10.5	10.2	8.4	28.5	0.4	2.1
4 kHz	1.9	1.9	1.0	2.4	3.2	0.0	0.4
8 kHz	16.3	11.3	8.1	7.8	27.0	3.7	5.6
16 kHz	5.4	1.3	1.3	2.3	3.7	0.0	0.0
TOTALS	18.9	36.7	74.9	153.9	251.2	27.0	22.3

1350 Hz center frequency, 129 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L031							
0.125 kHz	0.6	5.4	8.3	8.3	7.3	0.0	0.9
0.25 kHz	0.3	2.5	1.6	1.6	1.9	0.1	0.2
0.5 kHz	0.7	1.4	0.0	1.6	1.0	0.0	0.0
1 kHz	0.3	2.0	0.8	0.8	1.2	0.0	0.0
2 kHz	0.0	0.2	1.4	0.8	0.8	0.0	0.0
4 kHz	0.3	0.8	0.2	0.8	0.6	0.0	0.0
8 kHz	1.7	2.0	0.8	2.0	1.6	0.0	0.0
16 kHz	0.0	0.6	0.6	0.6	0.6	0.0	0.0
Chinchilla L047R							
0.125 kHz	2.8	3.7	5.8	15.4	8.3	0.0	0.0
0.25 kHz	0.8	1.2	0.6	5.7	2.5	0.0	0.0
0.5 kHz	0.0	1.5	1.5	3.0	2.0	0.0	0.0
1 kHz	0.0	0.6	0.3	2.5	1.1	0.0	0.0
2 kHz	2.1	8.4	8.7	7.2	8.1	0.1	1.2
4 kHz	0.3	0.6	0.9	0.6	0.7	0.0	0.3
8 kHz	0.0	0.0	0.0	0.9	0.3	0.0	0.0
16 kHz	0.0	0.6	0.6	0.9	0.7	0.0	0.0
Chinchilla L051R							
0.125 kHz	1.3	20.6	51.8	50.2	40.9	0.0	1.0
0.25 kHz	0.4	11.1	23.1	58.4	30.9	0.0	0.3
0.5 kHz	0.0	1.2	4.5	10.3	5.3	0.0	0.0
1 kHz	0.0	1.5	4.4	4.1	3.3	0.0	0.0
2 kHz	0.4	0.0	1.8	0.6	0.8	0.0	0.0
4 kHz	0.0	0.0	0.3	0.0	0.1	0.0	0.0
8 kHz	0.7	0.9	0.6	0.9	0.8	0.0	0.3
16 kHz	0.4	0.6	0.0	0.0	0.2	0.0	0.0

1350 Hz center frequency, 129 dB peak SPL

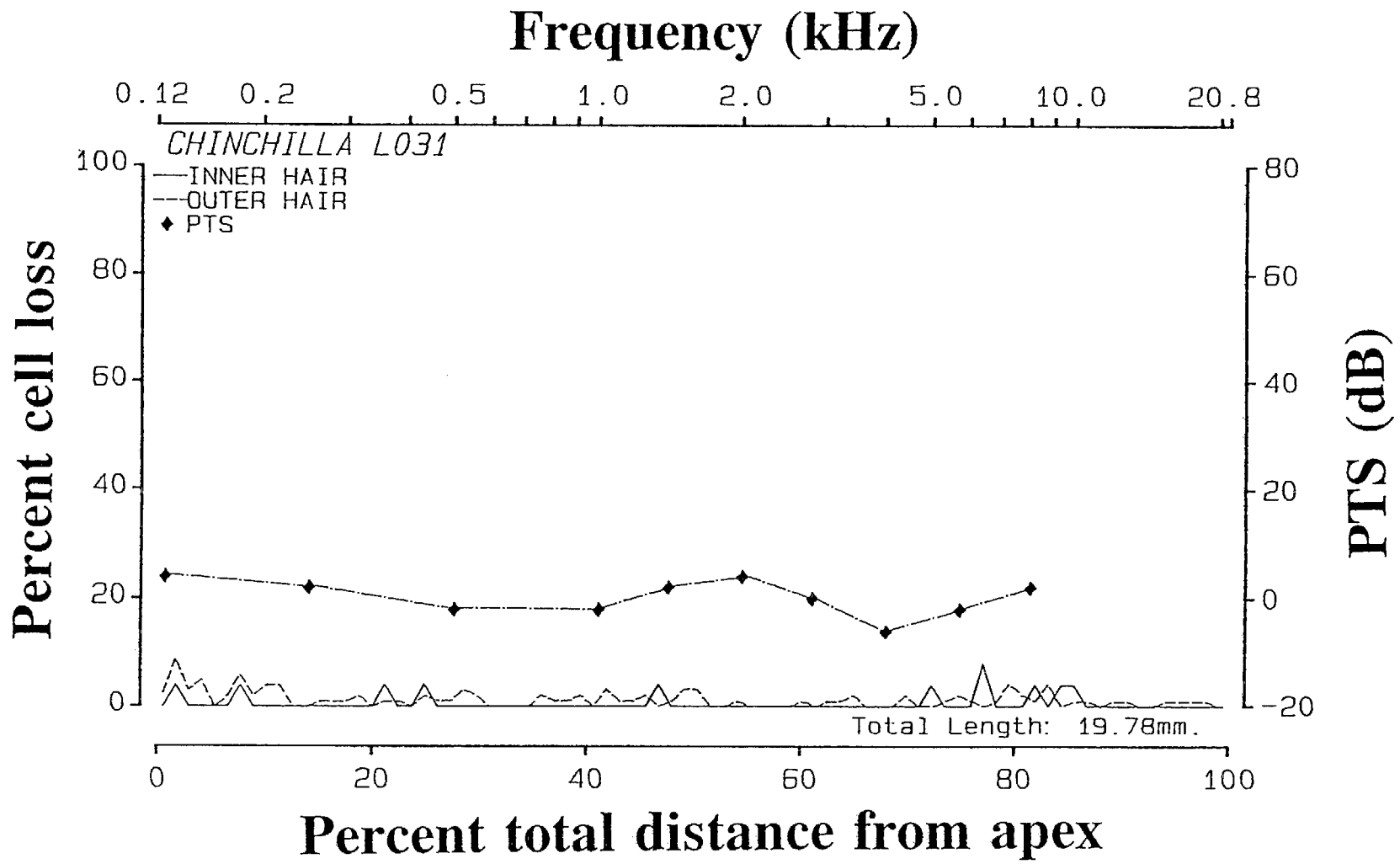
Percent sensory cell losses over octave band frequencies

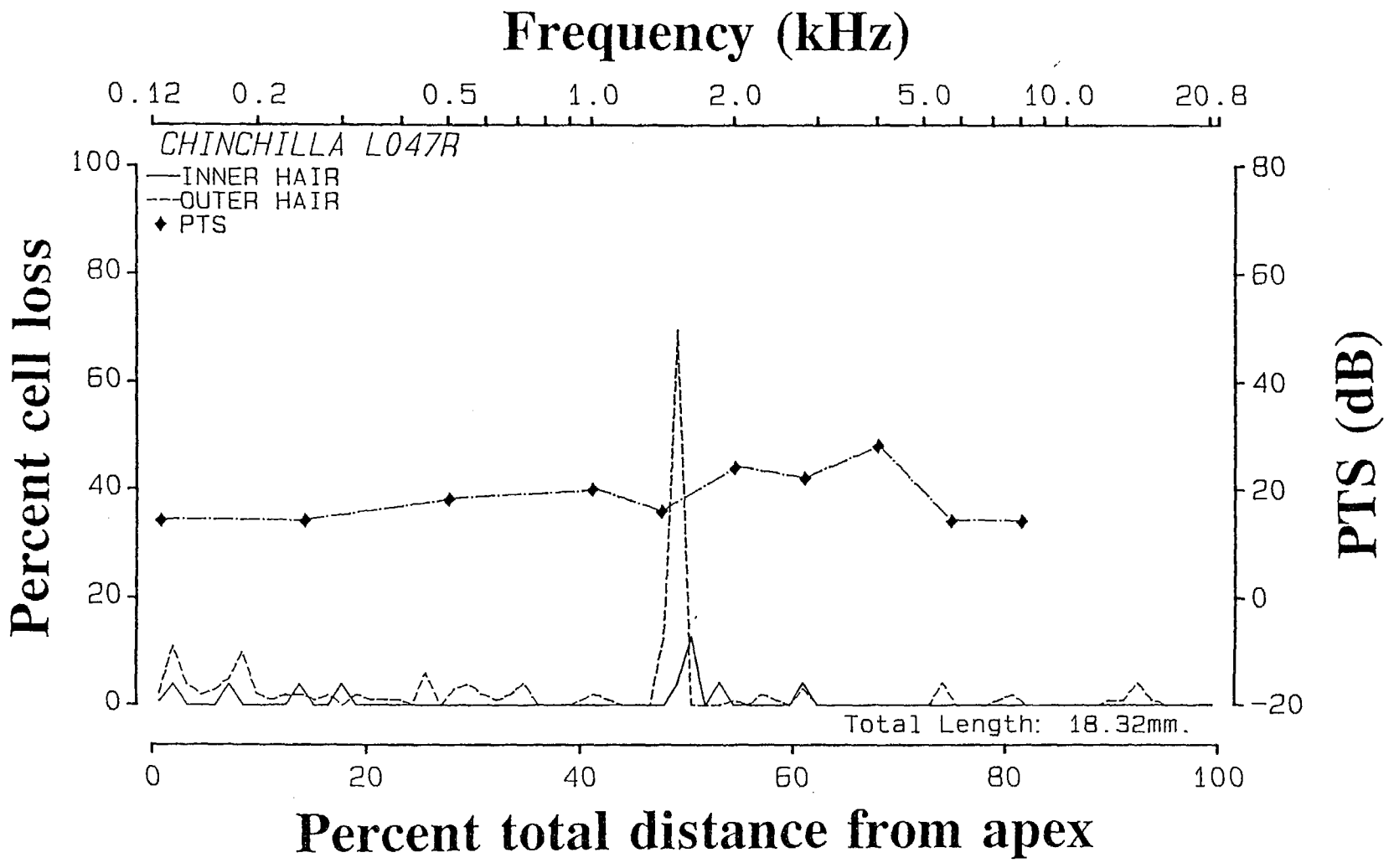
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla L069R							
0.125 kHz	0.0	26.4	57.3	67.4	50.4	0.0	0.0
0.25 kHz	1.2	2.8	10.2	54.8	22.6	0.0	0.0
0.5 kHz	0.4	0.3	1.2	26.4	9.3	0.0	0.0
1 kHz	6.0	18.8	19.5	21.5	19.9	6.4	8.7
2 kHz	0.0	1.9	1.3	2.9	2.0	0.0	1.3
4 kHz	0.4	0.0	0.3	0.3	0.2	0.0	0.0
8 kHz	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16 kHz	5.9	0.0	0.3	0.3	0.2	0.0	0.0
Chinchilla L093R							
0.125 kHz	1.3	3.0	17.0	39.1	19.7	0.0	0.5
0.25 kHz	0.3	4.1	2.6	9.9	5.5	0.0	0.0
0.5 kHz	0.7	0.8	3.2	3.8	2.6	0.0	0.0
1 kHz	0.0	0.9	1.8	4.6	2.4	0.0	0.0
2 kHz	0.4	0.9	0.9	2.1	1.3	0.0	0.0
4 kHz	1.9	0.3	0.3	2.1	0.9	0.0	0.0
8 kHz	15.4	8.7	6.3	6.3	7.1	1.6	4.2
16 kHz	1.2	1.3	0.6	0.0	0.6	0.0	0.0
Chinchilla L095R							
0.125 kHz	0.6	2.5	8.1	16.3	9.0	0.0	0.0
0.25 kHz	1.1	0.8	0.5	3.2	1.5	0.0	0.0
0.5 kHz	0.0	6.7	1.7	0.8	3.1	0.0	0.0
1 kHz	12.3	28.5	27.6	28.2	28.1	12.9	18.4
2 kHz	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 kHz	0.0	1.5	0.0	0.6	0.7	0.0	0.0
8 kHz	0.0	0.3	0.6	0.3	0.4	0.0	0.0
16 kHz	0.7	0.6	1.2	1.9	1.2	0.0	0.0

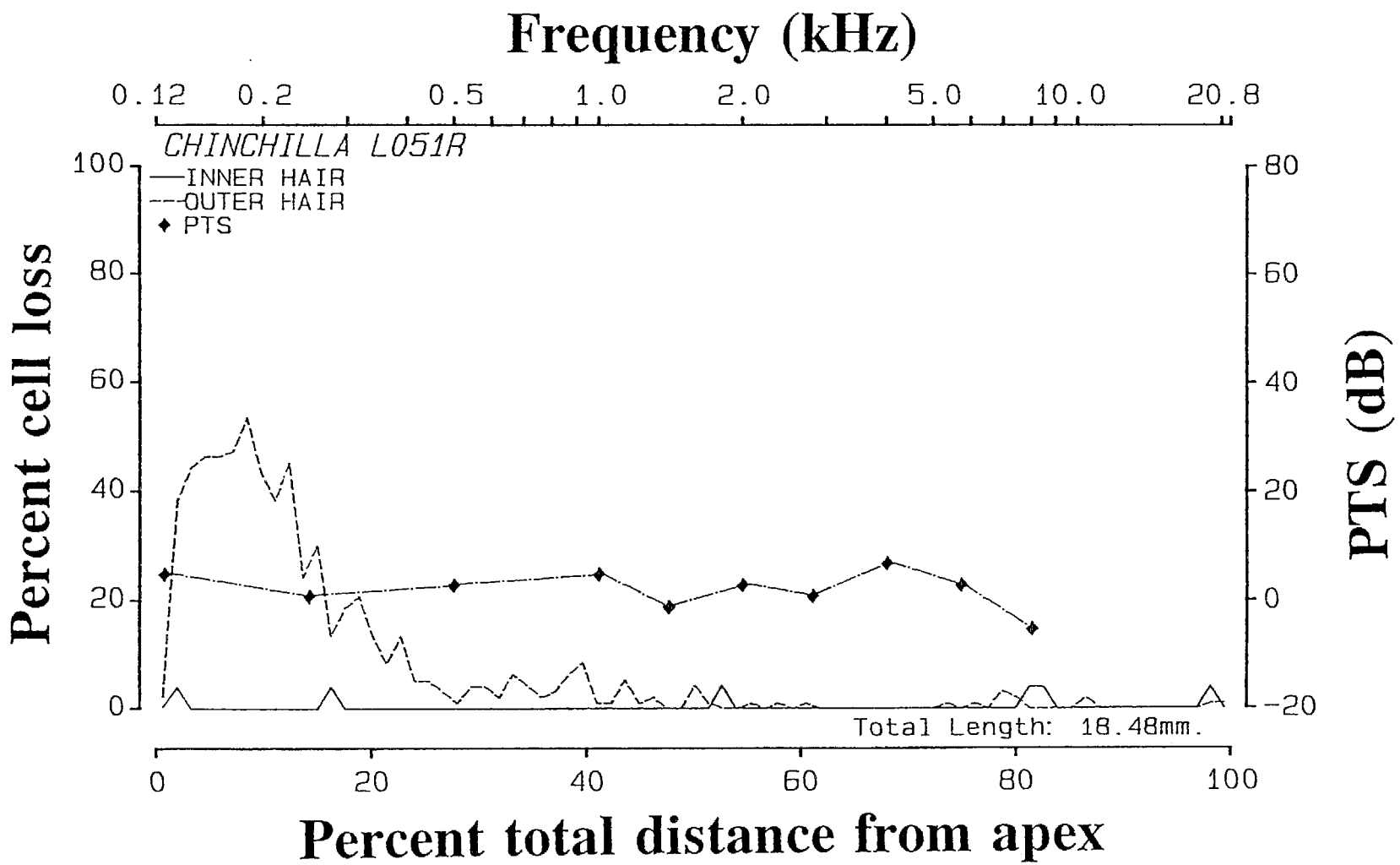
1350 Hz center frequency, 129 dB peak SPL

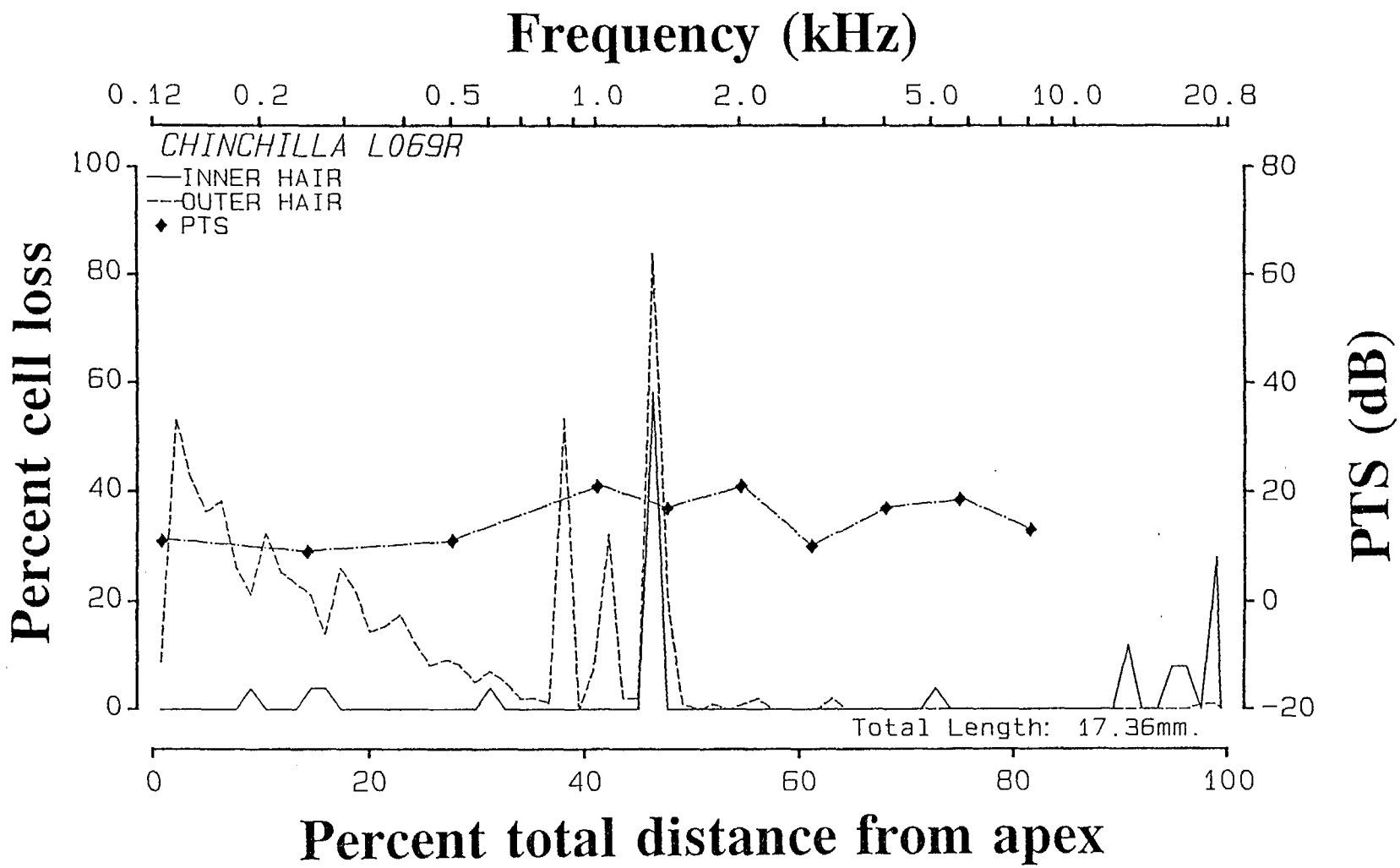
Percent sensory cell losses over octave band frequencies

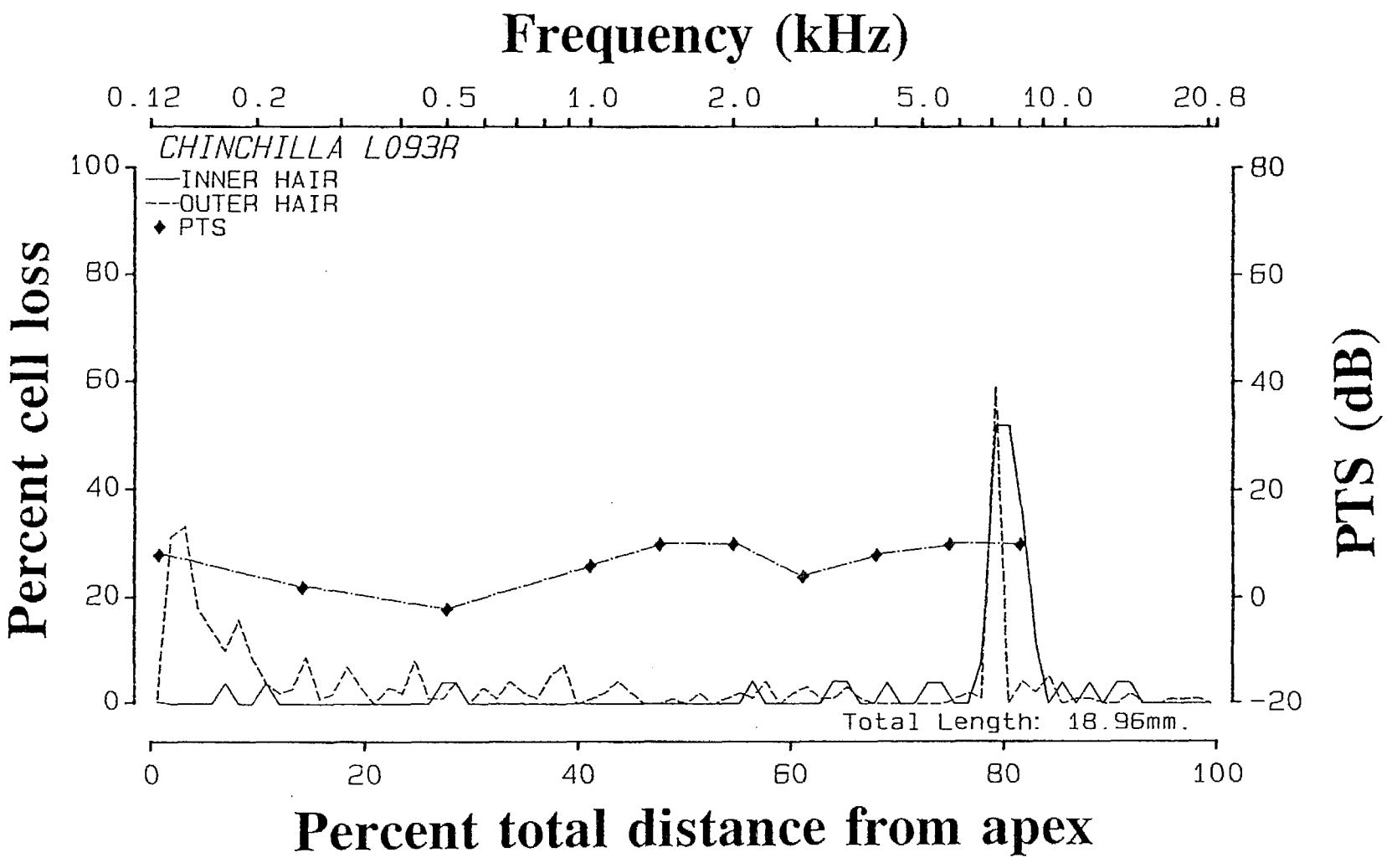
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.10	10.27	24.72	32.78	22.59	0.00	0.40
0.25 kHz	0.68	3.75	6.43	22.27	10.82	0.02	0.08
0.5 kHz	0.30	1.98	2.02	7.65	3.88	0.00	0.00
1 kHz	3.10	8.72	9.07	10.28	9.36	3.22	4.52
2 kHz	0.48	1.90	2.35	2.27	2.17	0.02	0.42
4 kHz	0.48	0.53	0.33	0.73	0.53	0.00	0.05
8 kHz	2.97	1.98	1.38	1.73	1.70	0.27	0.75
16 kHz	1.37	0.62	0.55	0.62	0.59	0.00	0.00
Group standard deviations							
0.125 kHz	0.97	10.46	23.49	23.30	18.64	0.00	0.47
0.25 kHz	0.41	3.79	8.94	26.77	12.68	0.04	0.13
0.5 kHz	0.35	2.35	1.59	9.78	3.02	0.00	0.00
1 kHz	5.09	11.98	11.59	11.56	11.68	5.39	7.64
2 kHz	0.82	3.27	3.17	2.64	2.98	0.04	0.65
4 kHz	0.71	0.57	0.30	0.73	0.31	0.00	0.12
8 kHz	6.13	3.38	2.43	2.34	2.70	0.65	1.69
16 kHz	2.27	0.41	0.40	0.72	0.38	0.00	0.00

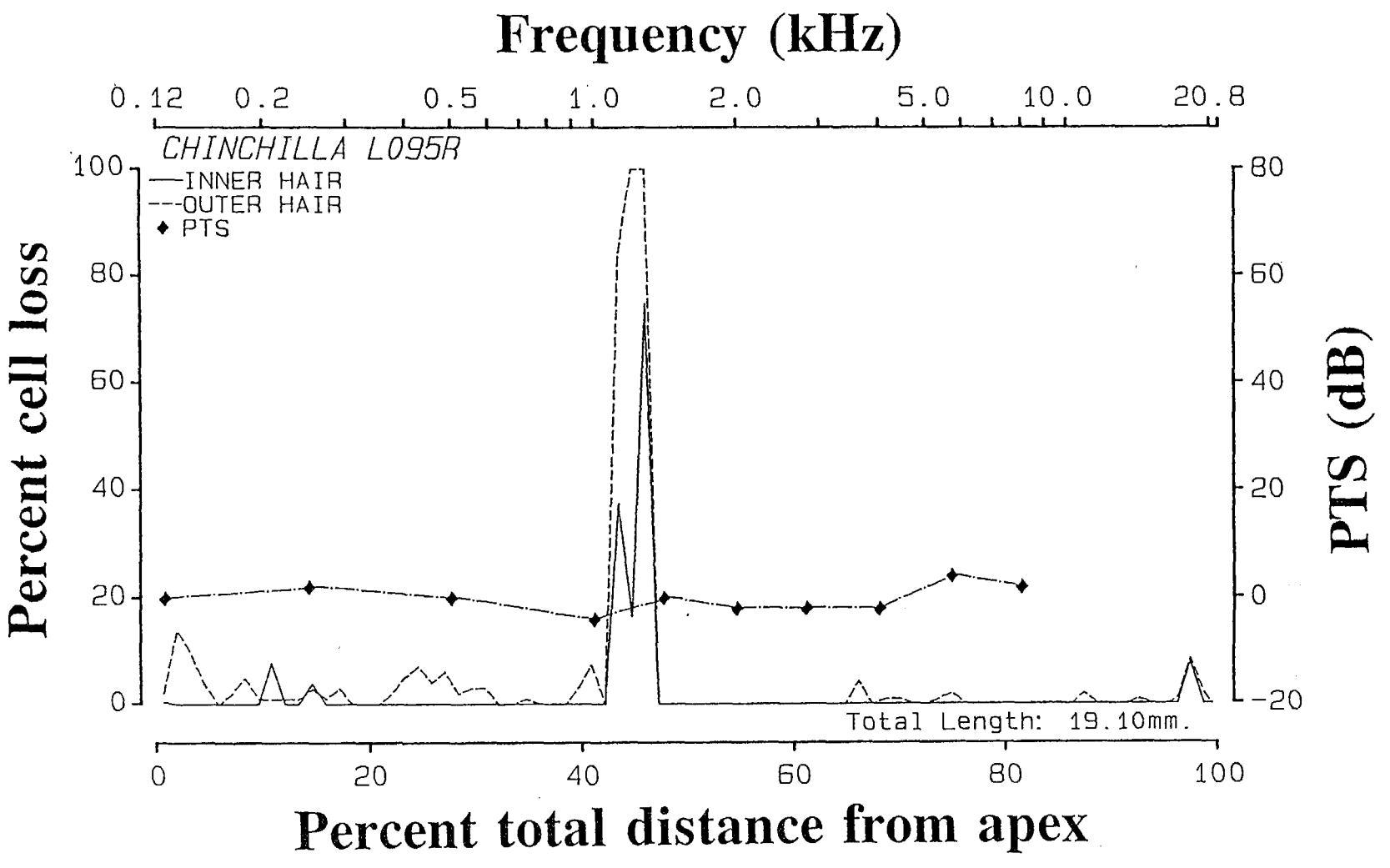

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L031
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.78mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L047R
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.32mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L051R
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.48mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L069R
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.36mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L093R
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.96mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA L095R
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.10mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1350 Hz center frequency, 134 dB peak SPL

Animal #		
M021	-	Completed the entire protocol
M033	-	Completed the entire protocol
M052	-	Completed the entire protocol
M097	-	Completed the entire protocol
M102	-	Completed the entire protocol
M105	-	Completed the entire protocol

1350 Hz center frequency, 134 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M021	25.0	4.0	2.0	2.0	3.0	5.0	3.0	3.0	4.0	1.0
M033	25.0	6.0	6.0	4.0	3.0	1.0	3.0	3.0	4.0	3.0
M052	23.0	4.0	2.0	2.0	5.0	1.0	5.0	7.0	2.0	2.0
M097	24.0	13.0	1.0	3.0	2.0	-2.0	0.0	0.0	3.0	-2.0
M102	24.0	5.0	1.0	-1.0	2.0	0.0	2.0	0.0	1.0	6.0
M105	21.0	4.0	8.0	2.0	5.0	1.0	1.0	3.0	2.0	3.0
Mean	23.7	6.0	3.3	2.0	3.3	1.0	2.3	2.7	2.7	2.2
S.D.	1.5	3.5	2.9	1.7	1.4	2.3	1.8	2.6	1.2	2.6

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M021	26.8	13.8	21.8	27.8	24.8	18.8	10.8	14.8	19.8	16.8
M033	25.0	6.0	8.0	8.0	5.2	3.0	3.0	3.0	8.0	5.0
M052	33.0	20.0	24.0	28.0	21.0	15.0	21.0	21.0	16.0	15.0
M097	43.0	28.0	24.0	20.0	17.0	7.0	1.0	1.0	6.0	7.0
M102	36.2	11.2	21.2	23.2	20.2	28.2	24.2	22.2	11.2	10.2
M105	35.0	18.0	20.0	22.0	19.0	17.0	17.0	15.0	18.0	17.0
Mean	33.2	16.2	19.8	21.5	17.9	14.8	12.8	12.8	13.2	11.8
S.D.	6.6	7.6	6.0	7.3	6.7	8.9	9.5	8.9	5.6	5.2

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M021	1.8	9.8	19.8	25.8	21.8	13.8	7.8	11.8	15.8	15.8
M033	0.0	0.0	2.0	4.0	2.2	2.0	0.0	0.0	4.0	2.0
M052	10.0	16.0	22.0	26.0	16.0	14.0	16.0	14.0	14.0	13.0
M097	19.0	15.0	23.0	17.0	15.0	9.0	1.0	1.0	3.0	9.0
M102	12.2	6.2	20.2	24.2	18.2	28.2	22.2	22.2	10.2	4.2
M105	14.0	14.0	12.0	20.0	14.0	16.0	16.0	12.0	16.0	14.0
Mean	9.5	10.2	16.5	19.5	14.5	13.8	10.5	10.2	10.5	9.7
S.D.	7.3	6.2	8.1	8.4	6.7	8.6	9.0	8.4	5.8	5.6

Temporary Threshold Shift (dB): 1350 Hz center frequency, 134 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	54.0	42.0	50.0	62.0	38.0	16.0	3.0	1.0	9.0	7.0	5.0	4.0	2.0	0.0	-2.0	62.0
M033	8.0	16.0	14.0	12.0	10.0	8.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	16.0
M052	46.0	14.0	12.0	20.0	28.0	25.0	13.0	11.0	9.0	7.0	6.0	14.0	12.0	10.0	8.0	46.0
M097	49.0	48.0	27.0	36.0	45.0	34.0	23.0	22.0	21.0	20.0	19.0	18.0	17.0	16.0	25.0	49.0
M102	33.0	32.0	41.0	30.0	29.0	28.0	17.0	-4.0	35.0	14.0	23.0	11.0	10.0	19.0	-2.0	41.0
M105	50.0	48.0	56.0	54.0	62.0	50.0	38.0	36.0	12.0	20.0	18.0	16.0	14.0	12.0	10.0	62.0
Mean	40.0	33.3	33.3	35.7	35.3	26.8	15.0	11.7	14.7	11.3	11.5	9.8	9.8	9.8	6.5	46.0
S.D.	17.2	15.4	18.5	19.3	17.6	14.6	14.9	14.9	11.7	8.0	9.9	8.4	5.8	7.6	10.4	17.0

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	56.0	64.0	42.0	74.0	50.0	-2.0	15.0	13.0	21.0	19.0	7.0	6.0	14.0	12.0	10.0	74.0
M033	18.0	16.0	34.0	32.0	30.0	8.0	16.0	4.0	12.0	0.0	-2.0	-4.0	4.0	2.0	0.0	34.0
M052	36.0	24.0	22.0	30.0	38.0	45.0	23.0	21.0	19.0	17.0	16.0	14.0	12.0	20.0	18.0	45.0
M097	51.0	50.0	49.0	48.0	67.0	46.0	35.0	24.0	33.0	32.0	21.0	20.0	-1.0	8.0	27.0	67.0
M102	43.0	22.0	51.0	70.0	59.0	38.0	17.0	16.0	35.0	14.0	3.0	11.0	0.0	9.0	8.0	70.0
M105	58.0	66.0	64.0	72.0	70.0	68.0	46.0	44.0	20.0	38.0	16.0	24.0	12.0	10.0	8.0	72.0
Mean	43.7	40.3	43.7	54.3	52.3	33.8	25.3	20.3	23.3	20.0	10.2	11.8	6.8	10.2	11.8	60.3
S.D.	15.0	22.4	14.6	20.4	16.0	26.1	12.6	13.5	8.9	13.5	8.9	10.1	6.7	5.9	9.4	16.7

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	52.0	50.0	58.0	70.0	36.0	24.0	21.0	19.0	27.0	25.0	23.0	22.0	20.0	18.0	16.0	70.0
M033	22.0	10.0	18.0	26.0	24.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	8.0	-4.0	4.0	26.0
M052	42.0	20.0	18.0	26.0	34.0	41.0	19.0	17.0	15.0	23.0	22.0	20.0	18.0	26.0	24.0	42.0
M097	57.0	56.0	55.0	54.0	63.0	52.0	41.0	30.0	29.0	28.0	27.0	26.0	15.0	24.0	23.0	63.0
M102	61.0	60.0	59.0	38.0	47.0	36.0	25.0	24.0	23.0	22.0	21.0	9.0	38.0	27.0	6.0	61.0
M105	58.0	66.0	74.0	72.0	70.0	58.0	46.0	44.0	20.0	38.0	16.0	24.0	12.0	10.0	-2.0	74.0
Mean	48.7	43.7	47.0	47.7	45.7	37.2	27.0	23.7	20.0	23.3	18.5	16.8	18.5	16.8	11.8	56.0
S.D.	14.7	23.0	23.4	20.8	17.9	17.2	13.8	12.4	8.5	11.1	8.8	10.2	10.5	12.0	10.7	18.4

Temporary Threshold Shift (dB): 1350 Hz center frequency, 134 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	54.0	52.0	50.0	72.0	48.0	26.0	33.0	21.0	29.0	27.0	25.0	24.0	22.0	30.0	28.0	72.0
M033	26.0	14.0	22.0	30.0	18.0	16.0	14.0	12.0	0.0	8.0	6.0	4.0	2.0	10.0	-2.0	30.0
M052	44.0	32.0	30.0	48.0	46.0	43.0	21.0	19.0	27.0	25.0	24.0	22.0	30.0	28.0	26.0	48.0
M097	47.0	36.0	55.0	54.0	63.0	52.0	51.0	30.0	29.0	18.0	17.0	16.0	15.0	14.0	23.0	63.0
M102	45.0	14.0	43.0	32.0	51.0	30.0	29.0	38.0	27.0	46.0	15.0	23.0	42.0	11.0	30.0	51.0
M105	56.0	64.0	72.0	80.0	78.0	56.0	54.0	42.0	28.0	36.0	34.0	32.0	10.0	8.0	16.0	80.0
Mean	45.3	35.3	45.3	52.7	50.7	37.2	33.7	27.0	23.3	26.7	20.2	20.2	20.2	16.8	20.2	57.3
S.D.	10.6	20.1	18.0	20.4	20.0	15.7	16.0	11.7	11.5	13.3	9.7	9.4	14.4	9.6	11.9	18.1

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	52.0	60.0	58.0	70.0	36.0	34.0	31.0	19.0	27.0	35.0	23.0	22.0	20.0	18.0	26.0	70.0
M033	16.0	14.0	12.0	20.0	28.0	16.0	14.0	12.0	10.0	-2.0	6.0	-5.0	2.0	0.0	8.0	28.0
M052	50.0	28.0	26.0	34.0	32.0	39.0	27.0	15.0	23.0	21.0	20.0	18.0	16.0	14.0	12.0	50.0
M097	57.0	46.0	55.0	64.0	63.0	42.0	41.0	30.0	29.0	18.0	17.0	16.0	15.0	14.0	13.0	64.0
M102	51.0	40.0	39.0	58.0	37.0	26.0	25.0	24.0	3.0	12.0	21.0	29.0	8.0	17.0	16.0	58.0
M105	52.0	60.0	68.0	66.0	74.0	52.0	50.0	38.0	24.0	32.0	30.0	28.0	6.0	4.0	2.0	74.0
Mean	46.3	41.3	43.0	52.0	45.0	34.8	31.3	23.0	19.3	19.3	19.5	18.0	11.2	11.2	12.8	57.3
S.D.	15.1	18.1	21.3	20.2	18.8	12.6	12.7	9.8	10.4	13.6	7.9	12.4	6.9	7.4	8.1	16.7

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	50.0	48.0	56.0	68.0	34.0	22.0	19.0	17.0	15.0	13.0	11.0	20.0	8.0	16.0	14.0	68.0
M033	18.0	6.0	14.0	22.0	20.0	18.0	16.0	14.0	12.0	0.0	-2.0	6.0	4.0	2.0	0.0	22.0
M052	54.0	12.0	20.0	28.0	46.0	33.0	21.0	19.0	17.0	15.0	14.0	12.0	10.0	18.0	16.0	54.0
M097	51.0	50.0	49.0	68.0	57.0	56.0	45.0	24.0	23.0	12.0	11.0	10.0	9.0	8.0	7.0	68.0
M102	53.0	52.0	41.0	60.0	59.0	28.0	27.0	26.0	35.0	24.0	33.0	31.0	20.0	39.0	18.0	60.0
M105	76.0	64.0	72.0	80.0	88.0	56.0	44.0	42.0	28.0	36.0	24.0	32.0	10.0	8.0	6.0	88.0
Mean	50.3	38.7	42.0	54.3	50.7	35.5	28.7	23.7	21.7	16.7	15.2	18.5	10.2	15.2	10.2	60.0
S.D.	18.6	23.7	22.0	23.7	23.4	16.7	12.8	10.0	8.7	12.2	12.1	11.1	5.3	13.1	6.9	21.9

Temporary Threshold Shift (dB): 1350 Hz center frequency, 134 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	42.0	50.0	48.0	70.0	26.0	4.0	11.0	9.0	7.0	5.0	3.0	12.0	10.0	8.0	6.0	70.0
M033	6.0	14.0	22.0	20.0	18.0	6.0	14.0	12.0	10.0	-2.0	6.0	-6.0	2.0	0.0	-2.0	22.0
M052	40.0	38.0	26.0	34.0	22.0	19.0	17.0	15.0	13.0	21.0	20.0	18.0	16.0	14.0	12.0	40.0
M097	29.0	28.0	47.0	36.0	65.0	34.0	23.0	12.0	1.0	0.0	-1.0	-2.0	-3.0	6.0	5.0	65.0
M102	51.0	40.0	29.0	58.0	37.0	36.0	25.0	34.0	23.0	22.0	31.0	39.0	8.0	27.0	6.0	58.0
M105	66.0	64.0	72.0	80.0	88.0	66.0	44.0	52.0	18.0	36.0	34.0	22.0	10.0	8.0	6.0	88.0
Mean	39.0	39.0	40.7	49.7	42.7	27.5	22.3	22.3	12.0	13.7	15.5	13.8	7.2	10.5	5.5	57.2
S.D.	20.4	17.3	18.8	23.3	27.9	23.2	11.9	17.1	7.8	15.0	15.0	16.5	6.7	9.3	4.5	23.3

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	42.0	40.0	48.0	70.0	26.0	4.0	1.0	9.0	7.0	5.0	3.0	22.0	20.0	8.0	6.0	70.0
M033	6.0	4.0	12.0	20.0	18.0	6.0	14.0	2.0	10.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	20.0
M052	38.0	16.0	14.0	12.0	20.0	17.0	15.0	13.0	11.0	9.0	8.0	16.0	14.0	12.0	20.0	38.0
M097	9.0	8.0	17.0	56.0	45.0	24.0	13.0	-8.0	-9.0	-10.0	-1.0	-2.0	-3.0	6.0	5.0	56.0
M102	33.0	32.0	41.0	60.0	29.0	28.0	37.0	26.0	25.0	14.0	23.0	21.0	30.0	19.0	18.0	60.0
M105	54.0	62.0	70.0	58.0	76.0	44.0	52.0	40.0	16.0	34.0	22.0	20.0	8.0	6.0	4.0	76.0
Mean	30.3	27.0	33.7	46.0	35.7	20.5	22.0	13.7	10.0	8.3	8.5	13.5	11.8	8.5	8.5	53.3
S.D.	19.0	22.0	23.3	23.9	22.0	14.9	18.8	17.2	11.2	15.1	11.6	10.1	12.1	6.4	8.6	20.9

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	40.0	48.0	56.0	78.0	24.0	22.0	9.0	7.0	5.0	3.0	11.0	20.0	18.0	16.0	14.0	78.0
M033	4.0	12.0	20.0	18.0	26.0	14.0	12.0	10.0	8.0	-4.0	4.0	2.0	0.0	8.0	6.0	26.0
M052	52.0	30.0	18.0	26.0	24.0	21.0	19.0	17.0	15.0	13.0	12.0	10.0	18.0	16.0	14.0	52.0
M097	-5.0	4.0	13.0	32.0	41.0	30.0	9.0	-2.0	-3.0	-4.0	5.0	4.0	-7.0	12.0	1.0	41.0
M102	21.0	40.0	49.0	58.0	27.0	36.0	35.0	34.0	13.0	22.0	1.0	19.0	8.0	7.0	16.0	58.0
M105	74.0	62.0	70.0	68.0	76.0	54.0	42.0	40.0	26.0	34.0	22.0	20.0	18.0	6.0	14.0	76.0
Mean	31.0	32.7	37.7	46.7	36.3	29.5	21.0	17.7	10.7	10.7	9.2	12.5	9.2	10.8	10.8	55.2
S.D.	30.0	21.9	23.7	24.6	20.5	14.2	14.2	16.3	9.9	15.3	7.6	8.3	10.8	4.5	5.9	20.1

Temporary Threshold Shift (dB): 1350 Hz center frequency, 134 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M021	48.0	46.0	54.0	56.0	42.0	10.0	17.0	15.0	3.0	11.0	19.0	18.0	16.0	14.0	12.0	56.0
M033	10.0	8.0	26.0	24.0	22.0	10.0	18.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	26.0
M052	27.0	25.0	13.0	21.0	9.0	16.0	14.0	22.0	10.0	8.0	17.0	15.0	13.0	11.0	9.0	27.0
M097	5.0	4.0	33.0	42.0	51.0	30.0	19.0	8.0	7.0	16.0	5.0	4.0	3.0	22.0	11.0	51.0
M102	21.0	20.0	19.0	38.0	37.0	36.0	25.0	14.0	-7.0	12.0	11.0	19.0	-2.0	-3.0	-4.0	38.0
M105	48.0	56.0	74.0	62.0	70.0	38.0	46.0	44.0	20.0	28.0	26.0	14.0	12.0	10.0	8.0	74.0
Mean	26.5	26.5	36.5	40.5	38.5	23.3	23.2	18.2	6.2	12.8	13.0	11.3	8.0	9.7	6.3	45.3
S.D.	18.4	20.7	23.2	16.5	21.5	12.9	11.8	13.9	8.9	8.8	9.6	8.4	6.8	8.6	6.2	18.6

1350 Hz center frequency, 134 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
M021	25	537	512	409	1458
M033	30	77	84	83	244
M052	116	174	204	259	637
M097	200	574	544	499	1617
M102	296	1364	1467	1218	4049
M105	188	983	1031	679	2693
Group mean	143				1783
S.D.	106				1398
S.E.	43				571

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	3.2	56.3
	0.25 kHz	3.8	112.3
	0.5 kHz	14.8	216.3
	1 kHz	94.7	651.3
	2 kHz	19.0	375.7
	4 kHz	2.0	179.2
	8 kHz	4.0	82.2
	16 kHz	1.0	109.7
Standard deviations			
	0.125 kHz	3.3	27.5
	0.25 kHz	5.9	89.4
	0.5 kHz	21.0	257.4
	1 kHz	77.0	320.3
	2 kHz	25.4	349.7
	4 kHz	1.1	296.9
	8 kHz	4.7	165.3
	16 kHz	1.7	116.1

1350 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M021							
0.125 kHz	6	4	5	20	29	0	0
0.25 kHz	0	15	17	32	64	0	1
0.5 kHz	2	34	28	12	74	0	1
1 kHz	6	313	300	253	866	7	42
2 kHz	5	139	141	66	346	0	4
4 kHz	1	11	2	4	17	0	0
8 kHz	5	17	14	16	47	6	5
16 kHz	0	4	5	6	15	0	0
TOTALS	25	537	512	409	1458	13	53
Chinchilla M033							
0.125 kHz	2	7	5	4	16	2	0
0.25 kHz	0	16	24	28	68	3	2
0.5 kHz	1	1	5	2	8	0	0
1 kHz	25	39	43	42	124	25	20
2 kHz	0	6	2	2	10	0	0
4 kHz	2	4	2	0	6	0	0
8 kHz	0	1	0	2	3	0	0
16 kHz	0	3	3	3	9	0	0
TOTALS	30	77	84	83	244	30	22
Chinchilla M052							
0.125 kHz	0	6	22	58	86	0	2
0.25 kHz	0	1	6	28	35	0	0
0.5 kHz	1	4	2	8	14	0	0
1 kHz	102	139	135	135	409	214	133
2 kHz	6	7	8	7	22	11	6
4 kHz	2	3	2	3	8	0	0
8 kHz	1	3	3	2	8	0	1
16 kHz	4	11	26	18	55	1	0
TOTALS	116	174	204	259	637	226	142

1350 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M097							
0.125 kHz	3	10	11	43	64	0	0
0.25 kHz	8	12	19	50	81	0	0
0.5 kHz	42	47	44	54	145	21	32
1 kHz	69	292	263	159	714	94	70
2 kHz	69	125	109	82	316	113	69
4 kHz	4	4	0	2	6	0	0
8 kHz	3	1	6	2	9	0	0
16 kHz	2	83	92	107	282	0	0
TOTALS	200	574	544	499	1617	228	171
Chinchilla M102							
0.125 kHz	8	10	17	46	73	0	0
0.25 kHz	14	126	76	76	278	1	25
0.5 kHz	42	276	291	77	644	21	16
1 kHz	201	316	316	316	948	435	277
2 kHz	16	309	311	263	883	21	19
4 kHz	2	212	253	271	736	0	0
8 kHz	13	102	173	143	418	2	3
16 kHz	0	13	30	26	69	0	0
TOTALS	296	1364	1467	1218	4049	480	340
Chinchilla M105							
0.125 kHz	0	12	21	37	70	0	1
0.25 kHz	1	33	56	59	148	1	15
0.5 kHz	1	208	175	30	413	0	0
1 kHz	165	304	302	241	847	347	213
2 kHz	18	275	287	115	677	18	12
4 kHz	1	91	112	99	302	0	0
8 kHz	2	1	4	3	8	0	0
16 kHz	0	59	74	95	228	0	0
TOTALS	188	983	1031	679	2693	366	241

1350 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	3.2	8.2	13.5	34.7	56.3	0.3	0.5
0.25 kHz	3.8	33.8	33.0	45.5	112.3	0.8	7.2
0.5 kHz	14.8	95.0	90.8	30.5	216.3	7.0	8.2
1 kHz	94.7	233.8	226.5	191.0	651.3	187.0	125.8
2 kHz	19.0	143.5	143.0	89.2	375.7	27.2	18.3
4 kHz	2.0	54.2	61.8	63.2	179.2	0.0	0.0
8 kHz	4.0	20.8	33.3	28.0	82.2	1.3	1.5
16 kHz	1.0	28.8	38.3	42.5	109.7	0.2	0.0
TOTALS	142.5	618.2	640.3	524.5	1783.0	223.8	161.5
Group standard deviations							
0.125 kHz	3.3	3.0	7.6	19.5	27.5	0.8	0.8
0.25 kHz	5.9	46.3	27.0	19.6	89.4	1.2	10.5
0.5 kHz	21.0	117.2	117.1	29.6	257.4	10.8	13.3
1 kHz	77.0	116.9	111.8	98.3	320.3	176.1	101.8
2 kHz	25.4	128.5	132.8	95.7	349.7	43.0	25.7
4 kHz	1.1	84.6	103.6	108.9	296.9	0.0	0.0
8 kHz	4.7	40.3	68.6	56.6	165.3	2.4	2.1
16 kHz	1.7	33.8	36.7	46.2	116.1	0.4	0.0
TOTALS	105.9	487.5	521.9	396.0	1398.4	183.2	118.2

1350 Hz center frequency, 134 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M021							
0.125 kHz	4.1	2.0	2.6	10.4	5.0	0.0	0.0
0.25 kHz	0.0	4.4	5.0	9.5	6.3	0.0	0.2
0.5 kHz	0.7	10.1	8.3	3.5	7.3	0.0	0.2
1 kHz	2.4	98.7	94.6	79.8	91.0	1.3	13.2
2 kHz	2.0	42.7	43.3	20.3	35.4	0.0	1.2
4 kHz	0.3	3.3	0.6	1.2	1.7	0.0	0.0
8 kHz	1.9	5.2	4.3	4.9	4.8	1.1	1.5
16 kHz	0.0	1.3	1.6	1.9	1.6	0.0	0.0
Chinchilla M033							
0.125 kHz	1.4	3.7	2.7	2.1	2.8	0.7	0.0
0.25 kHz	0.0	4.9	7.4	8.6	7.0	0.6	0.6
0.5 kHz	0.4	0.3	1.5	0.6	0.8	0.0	0.0
1 kHz	10.5	12.6	13.9	13.6	13.4	5.0	6.4
2 kHz	0.0	1.9	0.6	0.6	1.0	0.0	0.0
4 kHz	0.7	1.2	0.6	0.0	0.6	0.0	0.0
8 kHz	0.0	0.3	0.0	0.6	0.3	0.0	0.0
16 kHz	0.0	0.9	0.9	0.9	0.9	0.0	0.0
Chinchilla M052							
0.125 kHz	0.0	3.1	11.6	30.6	15.1	0.0	1.0
0.25 kHz	0.0	0.3	1.8	8.4	3.5	0.0	0.0
0.5 kHz	0.4	1.2	0.6	2.4	1.4	0.0	0.0
1 kHz	42.1	44.1	42.8	42.8	43.2	42.0	42.2
2 kHz	2.5	2.1	2.4	2.1	2.2	2.1	1.8
4 kHz	0.7	0.9	0.6	0.9	0.8	0.0	0.0
8 kHz	0.3	0.9	0.9	0.6	0.8	0.0	0.3
16 kHz	1.7	3.8	8.9	6.2	6.3	0.2	0.0

1350 Hz center frequency, 134 dB peak SPL

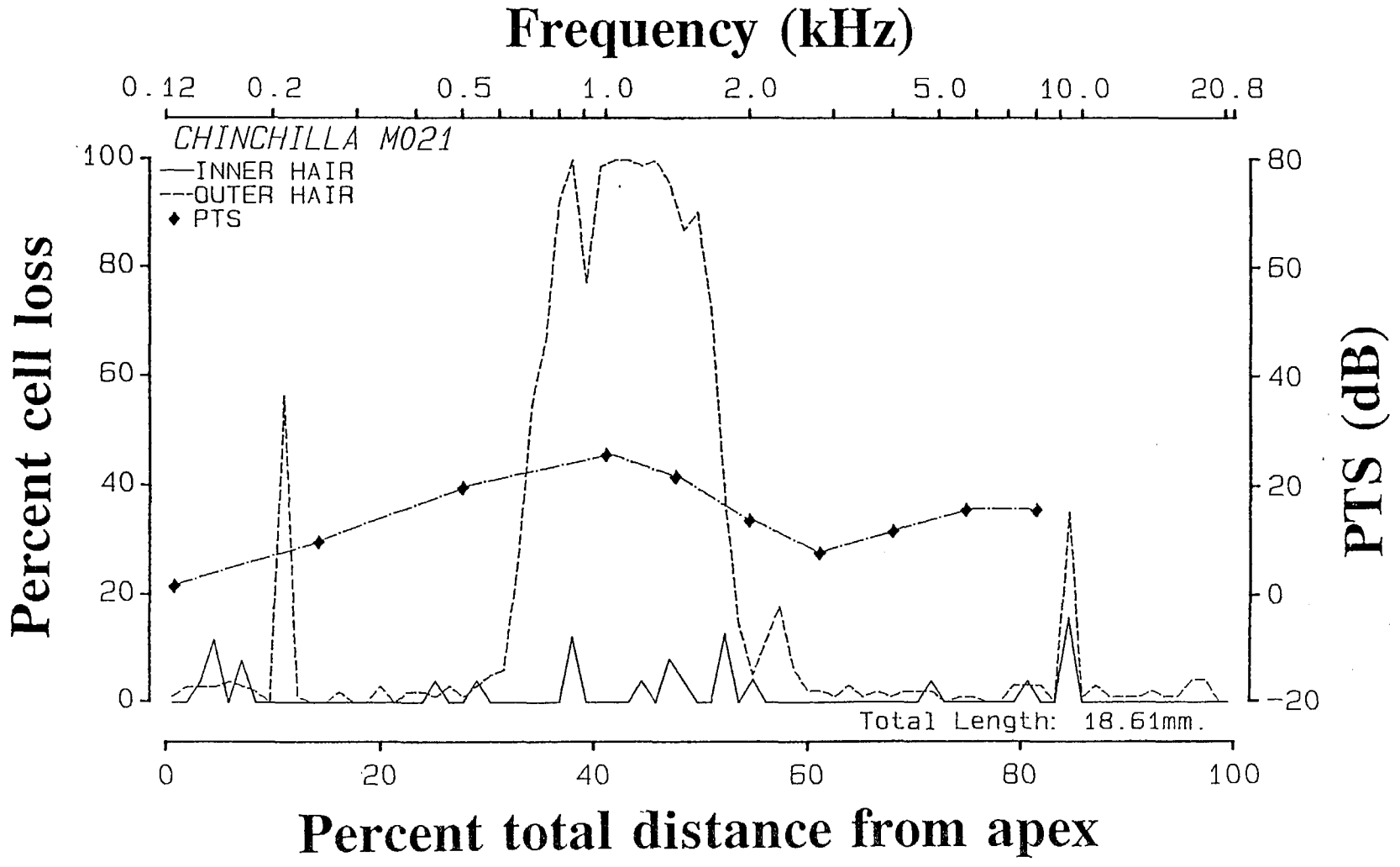
Percent sensory cell losses over octave band frequencies

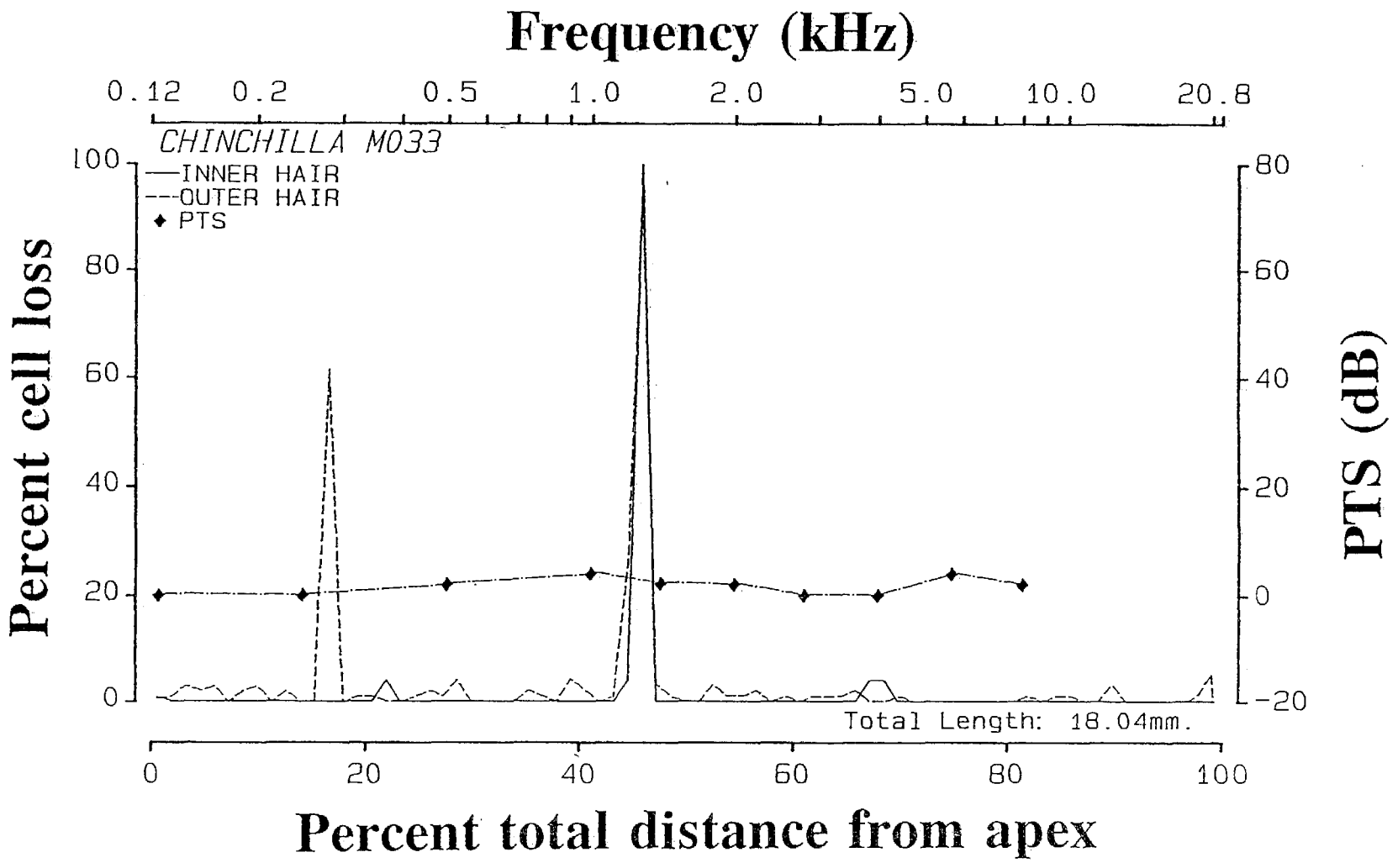
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M097							
0.125 kHz	2.0	5.2	5.7	22.6	11.2	0.0	0.0
0.25 kHz	3.1	3.5	5.6	14.9	8.0	0.0	0.0
0.5 kHz	16.8	14.1	13.2	16.2	14.5	4.0	9.6
1 kHz	28.0	92.1	82.9	50.1	75.0	18.3	22.0
2 kHz	28.6	38.5	33.6	25.3	32.5	21.6	21.2
4 kHz	1.5	1.2	0.0	0.6	0.6	0.0	0.0
8 kHz	1.1	0.3	1.8	0.6	0.9	0.0	0.0
16 kHz	0.8	26.6	29.5	34.4	30.2	0.0	0.0
Chinchilla M102							
0.125 kHz	5.5	5.2	8.9	24.3	12.8	0.0	0.0
0.25 kHz	5.6	38.0	22.9	22.9	27.9	0.1	7.5
0.5 kHz	16.8	83.8	88.4	23.4	65.2	4.0	4.8
1 kHz	82.7	100.0	100.0	100.0	100.0	85.4	87.6
2 kHz	6.6	95.9	96.5	81.6	91.3	4.0	5.9
4 kHz	0.7	65.8	78.5	84.1	76.1	0.0	0.0
8 kHz	5.0	31.6	53.7	44.4	43.2	0.3	0.9
16 kHz	0.0	4.4	10.3	8.9	7.9	0.0	0.0
Chinchilla M105							
0.125 kHz	0.0	6.4	11.3	20.0	12.6	0.0	0.5
0.25 kHz	0.4	10.2	17.3	18.2	15.2	0.2	4.6
0.5 kHz	0.4	64.5	54.3	9.3	42.7	0.0	0.0
1 kHz	69.6	98.7	98.0	78.2	91.6	69.9	69.1
2 kHz	7.6	87.3	91.1	36.5	71.6	3.5	3.8
4 kHz	0.3	28.8	35.5	31.4	31.9	0.0	0.0
8 kHz	0.7	0.3	1.2	0.9	0.8	0.0	0.0
16 kHz	0.0	19.1	24.0	30.8	24.6	0.0	0.0

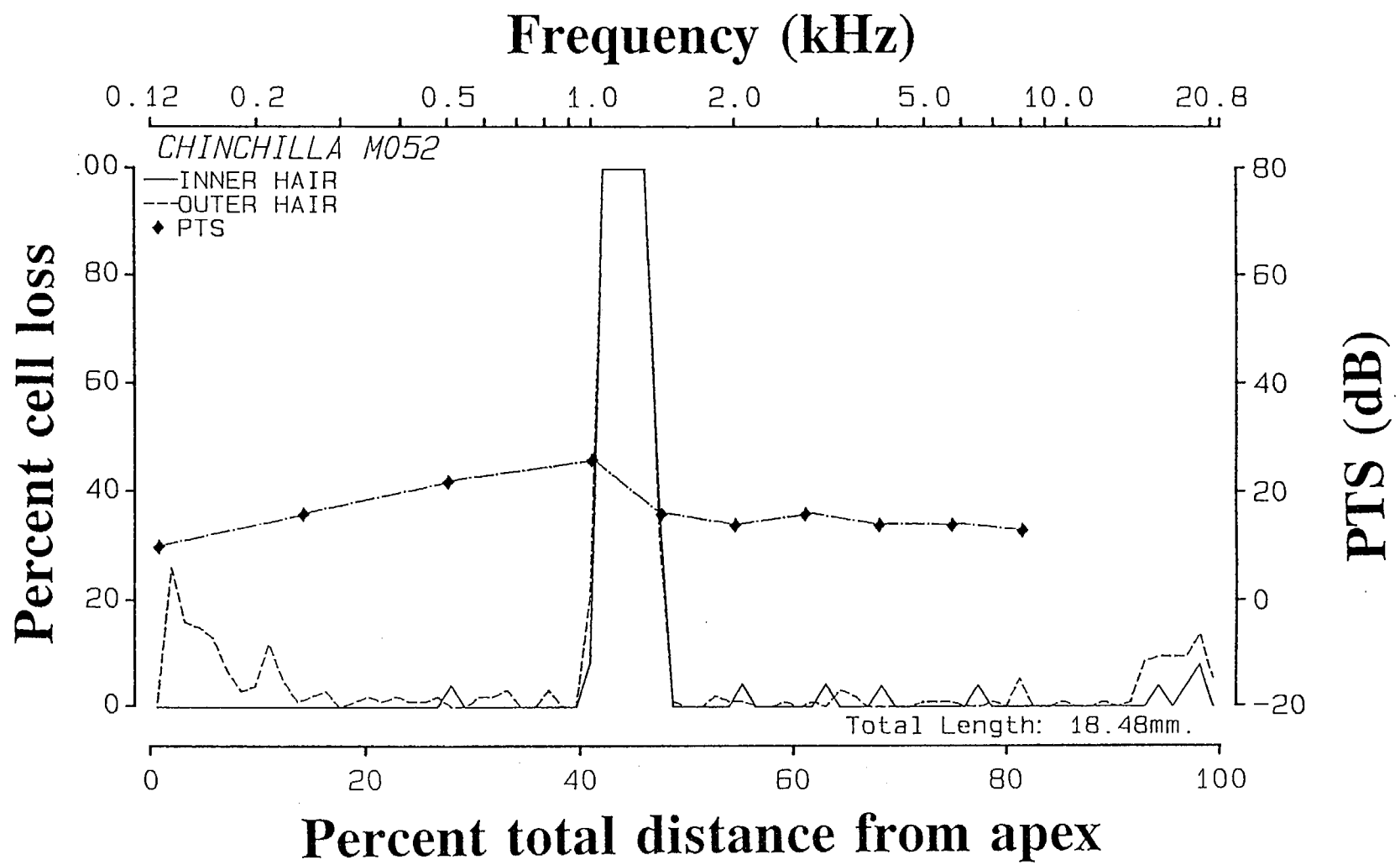
1350 Hz center frequency, 134 dB peak SPL

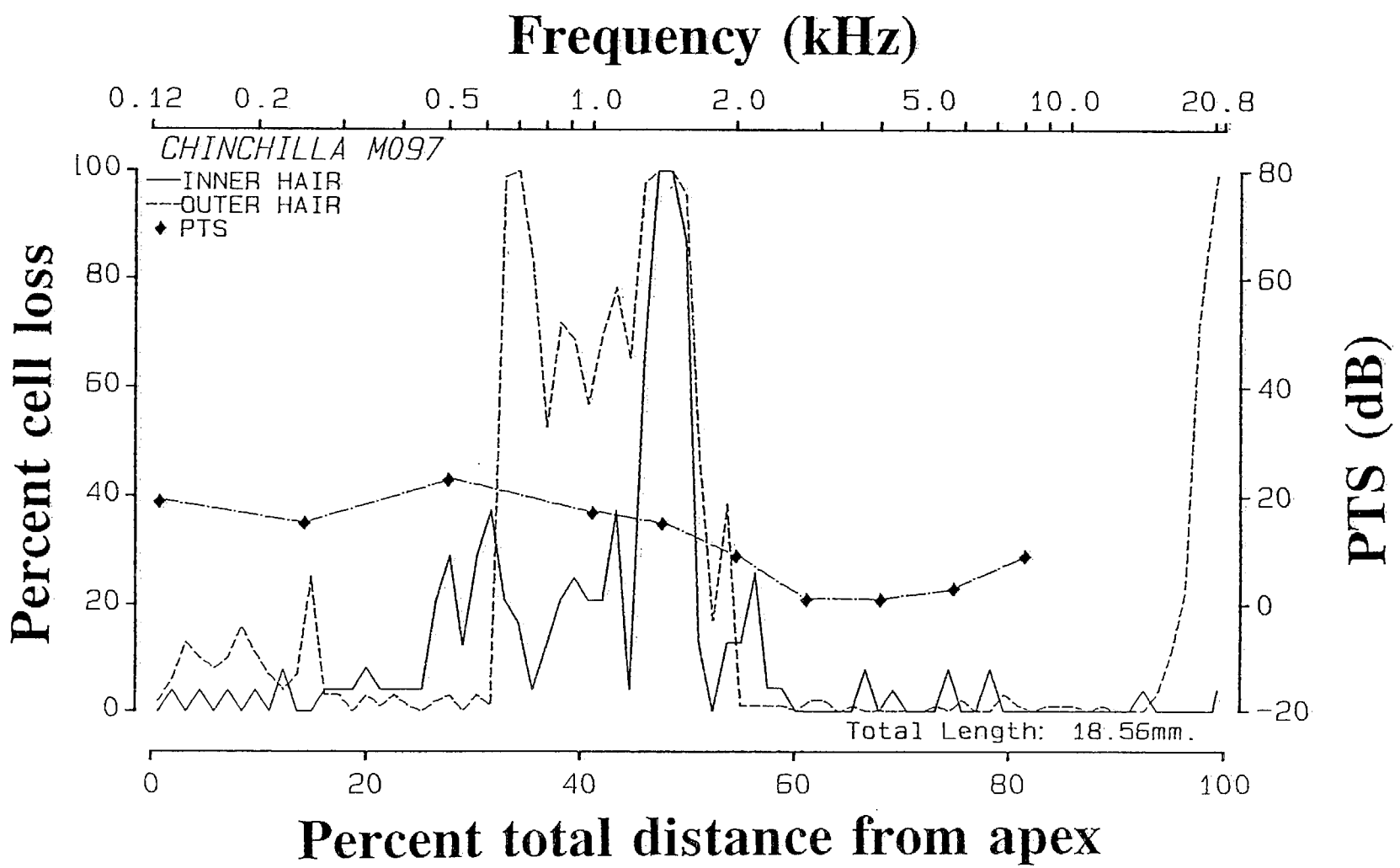
Percent sensory cell losses over octave band frequencies

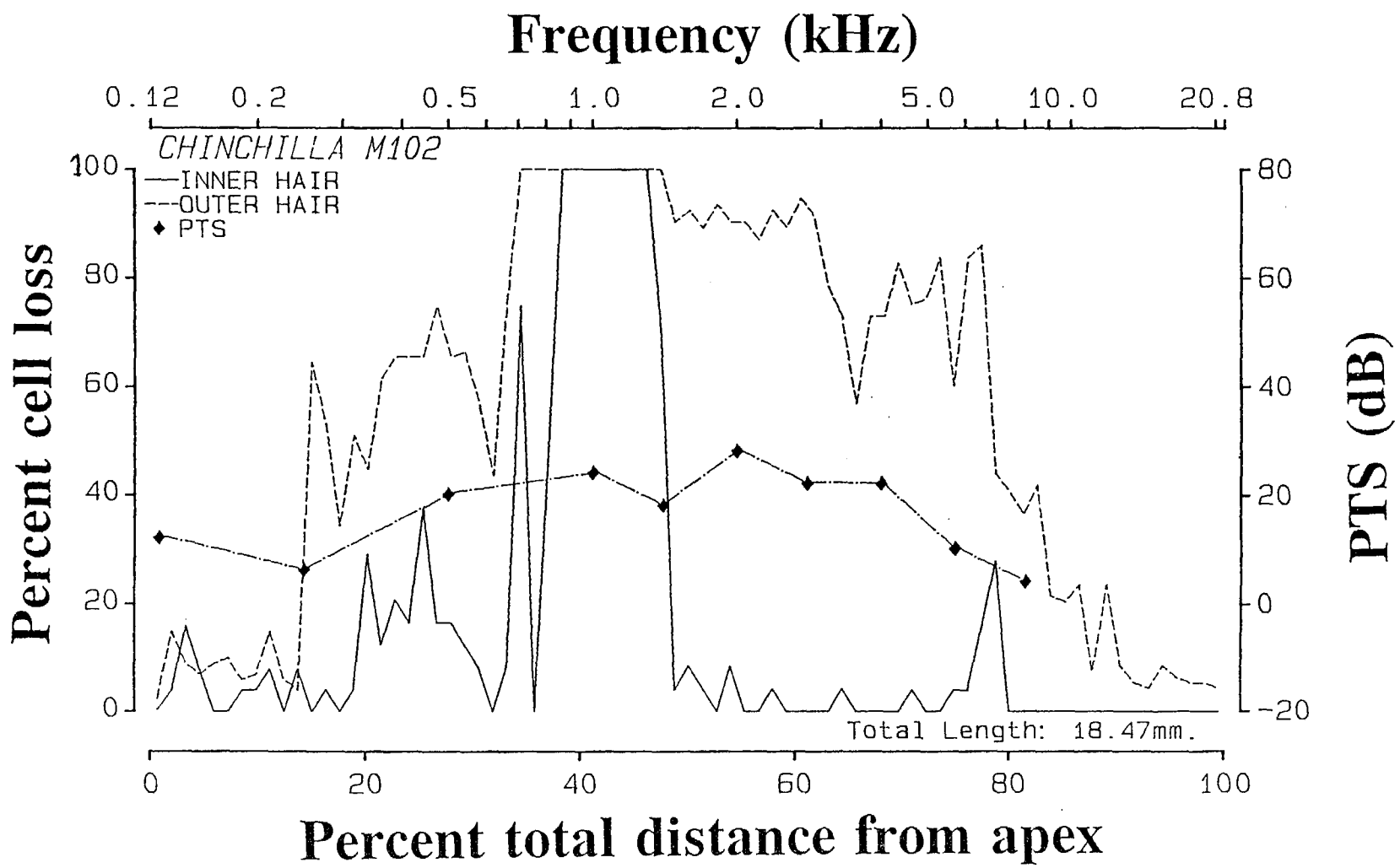
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	2.17	4.27	7.13	18.33	9.91	0.12	0.25
0.25 kHz	1.52	10.22	10.00	13.75	11.32	0.15	2.15
0.5 kHz	5.92	29.00	27.72	9.23	21.98	1.33	2.43
1 kHz	39.22	74.37	72.03	60.75	69.05	36.98	40.08
2 kHz	7.88	44.73	44.58	27.73	39.02	5.20	5.65
4 kHz	0.70	16.87	19.30	19.70	18.62	0.00	0.00
8 kHz	1.50	6.43	10.32	8.67	8.47	0.23	0.45
16 kHz	0.42	9.35	12.53	13.85	11.91	0.03	0.00
Group standard deviations							
0.125 kHz	2.23	1.62	4.07	10.33	4.86	0.29	0.42
0.25 kHz	2.34	13.98	8.22	5.97	9.03	0.23	3.16
0.5 kHz	8.43	35.89	35.78	8.98	26.23	2.07	3.99
1 kHz	32.03	37.11	35.55	31.20	33.92	34.92	32.52
2 kHz	10.55	40.31	41.70	29.78	36.48	8.21	7.90
4 kHz	0.44	26.33	32.21	33.86	30.78	0.00	0.00
8 kHz	1.84	12.48	21.30	17.59	17.11	0.44	0.62
16 kHz	0.71	10.81	11.77	14.85	12.41	0.08	0.00

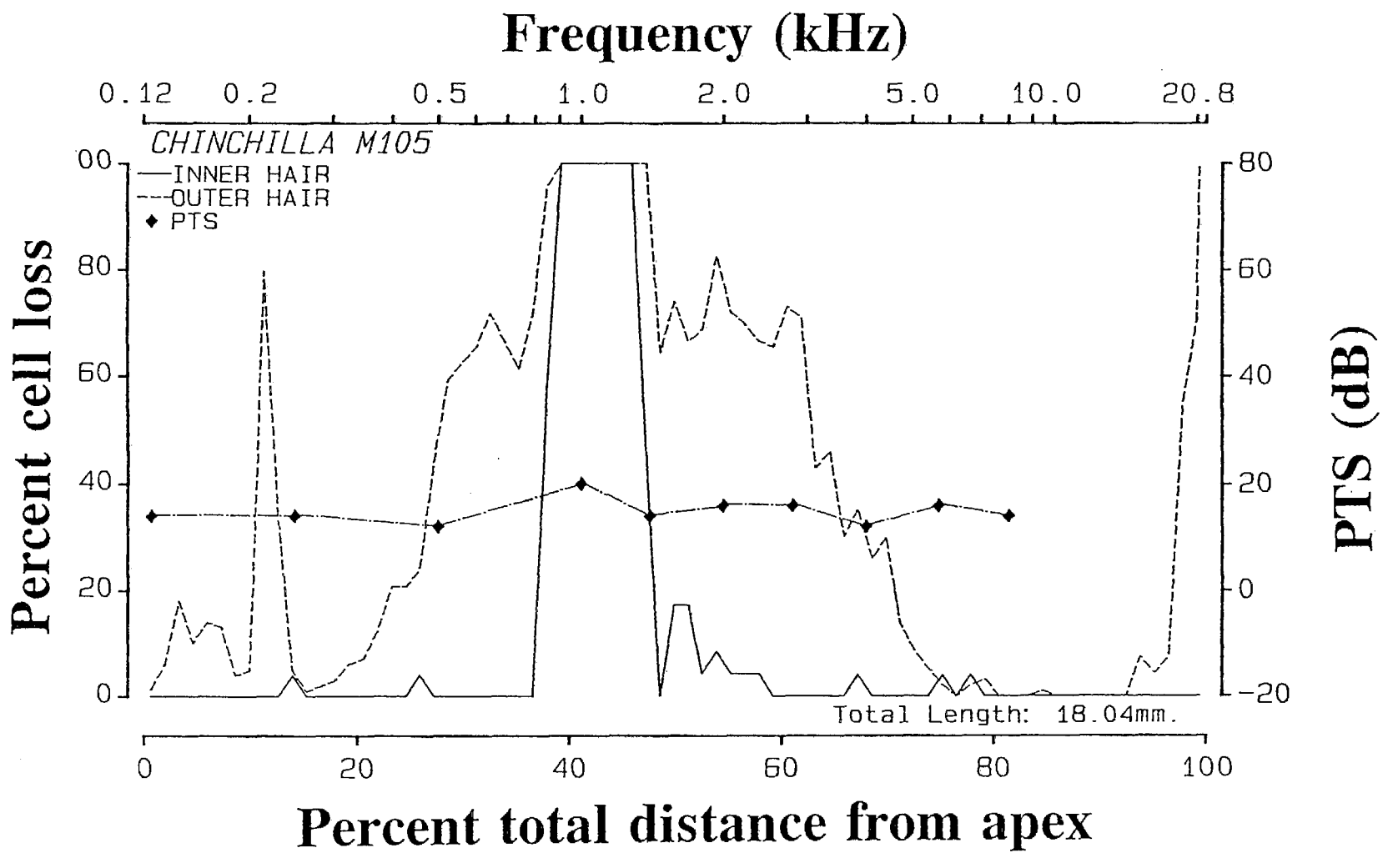

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M021
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.61mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M033
—INNER HAIR
---OUTER HAIR
✦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.04mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M052
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.48mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M097
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.56mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M102
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.47mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M105
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.04mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

1350 Hz center frequency, 139 dB peak SPL

Animal #		
K104	–	Completed the entire protocol
K110	–	Completed the entire protocol
K121	–	Completed the entire protocol
K123	–	Completed the entire protocol
K126	–	Completed the entire protocol
K134	–	Completed the entire protocol

1350 Hz center frequency, 139 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
K104	25.0	12.0	5.0	0.0	1.0	2.0	3.0	4.0	2.0	6.0
K110	22.0	10.0	6.0	2.0	4.0	4.0	1.0	2.0	3.0	8.0
K121	24.0	10.0	0.0	3.0	-2.0	2.0	3.0	2.0	3.0	6.0
K123	27.0	10.0	3.0	4.0	1.0	2.0	1.0	0.0	0.0	2.0
K126	24.0	8.0	-4.0	2.0	-2.0	4.0	2.0	2.0	-3.0	4.0
K134	25.0	13.0	3.0	1.0	1.0	3.0	2.0	5.0	4.0	6.0
Mean	24.5	10.5	2.2	2.0	0.5	2.8	2.0	2.5	1.5	5.3
S.D.	1.6	1.8	3.7	1.4	2.3	1.0	0.9	1.8	2.6	2.1

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
K104	43.8	42.8	45.8	48.8	49.8	52.8	57.8	52.8	52.8	56.8
K110	60.0	70.0	44.0	42.0	44.0	48.0	49.0	40.0	39.0	46.0
K121	34.6	41.8	36.6	43.6	44.6	51.6	50.8	41.8	35.8	35.8
K123	53.0	58.0	37.0	38.0	39.0	40.0	35.0	30.0	30.0	26.0
K126	49.8	51.8	44.4	47.8	49.8	55.8	46.8	45.8	44.8	51.8
K134	41.8	39.8	39.8	41.8	35.8	47.8	38.8	31.8	28.8	29.4
Mean	47.2	50.7	41.3	43.7	43.8	49.3	46.4	40.4	38.5	41.0
S.D.	9.0	11.7	4.0	4.1	5.7	5.5	8.3	8.6	9.1	12.5

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
K104	18.8	30.8	40.8	48.8	48.8	50.8	54.8	48.8	50.8	50.8
K110	38.0	60.0	38.0	40.0	40.0	44.0	48.0	38.0	36.0	38.0
K121	10.6	31.8	36.6	40.6	46.6	49.6	47.8	39.8	32.8	29.8
K123	26.0	48.0	34.0	34.0	38.0	38.0	34.0	30.0	30.0	24.0
K126	25.8	43.8	48.4	45.8	51.8	51.8	44.8	43.8	47.8	47.8
K134	16.8	26.8	36.8	40.8	34.8	44.8	36.8	26.8	24.8	23.4
Mean	22.7	40.2	39.1	41.7	43.3	46.5	44.4	37.9	37.0	35.6
S.D.	9.5	12.7	5.1	5.1	6.7	5.3	7.7	8.3	10.2	11.9

Temporary Threshold Shift (dB): 1350 Hz center frequency, 139 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	65.0	58.0	56.0	60.0	40.0	32.0	19.0	27.0	17.0	22.0	15.0	23.0	19.0	17.0	20.0	65.0
K110	67.0	67.0	67.0	67.0	60.0	62.0	56.0	44.0	42.0	40.0	38.0	36.0	34.0	42.0	40.0	67.0
K121	52.0	61.0	66.0	66.0	46.0	49.0	44.0	33.0	36.0	25.0	15.0	14.0	12.0	12.0	0.0	66.0
K123	58.0	58.0	63.0	63.0	58.0	38.0	26.0	44.0	22.0	30.0	20.0	28.0	26.0	24.0	32.0	63.0
K126	65.0	65.0	54.0	65.0	65.0	65.0	40.0	37.0	36.0	35.0	24.0	23.0	22.0	31.0	29.0	65.0
K134	64.0	58.0	57.0	59.0	64.0	59.0	38.0	16.0	23.0	21.0	28.0	26.0	4.0	12.0	14.0	64.0
Mean	61.8	61.2	60.5	63.3	55.5	50.8	37.2	33.5	29.3	28.8	23.3	25.0	19.5	23.0	22.5	65.0
S.D.	5.7	4.0	5.5	3.3	10.2	13.5	13.1	10.8	9.9	7.6	8.8	7.2	10.5	11.9	14.3	1.4

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	74.0	82.0	80.0	84.0	64.0	46.0	33.0	51.0	31.0	36.0	29.0	37.0	33.0	31.0	24.0	84.0
K110	91.0	91.0	78.0	91.0	84.0	82.0	70.0	68.0	56.0	54.0	52.0	60.0	58.0	66.0	64.0	91.0
K121	57.0	76.0	91.0	91.0	61.0	64.0	49.0	40.0	41.0	40.0	30.0	39.0	28.0	27.0	35.0	91.0
K123	46.0	76.0	91.0	91.0	86.0	56.0	54.0	52.0	50.0	48.0	48.0	46.0	44.0	52.0	50.0	91.0
K126	79.0	93.0	72.0	74.0	83.0	93.0	78.0	65.0	44.0	43.0	52.0	41.0	40.0	39.0	47.0	93.0
K134	63.0	62.0	61.0	69.0	67.0	75.0	52.0	30.0	27.0	35.0	22.0	30.0	28.0	26.0	28.0	75.0
Mean	68.3	80.0	78.8	83.3	74.2	69.3	56.0	51.0	41.5	42.7	38.8	42.2	38.5	40.2	41.3	87.5
S.D.	16.2	11.4	11.5	9.7	11.3	17.3	16.0	14.5	11.0	7.3	13.3	10.2	11.5	15.9	15.1	6.9

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	93.0	93.0	84.0	93.0	78.0	60.0	37.0	45.0	35.0	40.0	53.0	51.0	37.0	35.0	28.0	93.0
K110	82.0	91.0	86.0	91.0	84.0	72.0	70.0	58.0	46.0	44.0	42.0	40.0	38.0	36.0	34.0	91.0
K121	74.0	84.0	87.0	98.0	68.0	71.0	62.0	55.0	38.0	57.0	46.0	46.0	35.0	24.0	32.0	98.0
K123	60.0	70.0	90.0	90.0	70.0	50.0	48.0	46.0	34.0	22.0	32.0	30.0	28.0	36.0	44.0	90.0
K126	67.0	88.0	80.0	92.0	81.0	70.0	76.0	63.0	60.0	51.0	41.0	50.0	49.0	47.0	55.0	92.0
K134	69.0	78.0	77.0	85.0	89.0	71.0	58.0	46.0	33.0	41.0	48.0	36.0	34.0	32.0	34.0	89.0
Mean	74.2	84.0	84.0	91.5	78.3	65.7	58.5	52.2	41.0	42.5	43.7	42.2	36.8	35.0	37.8	92.2
S.D.	11.8	8.7	4.8	4.2	8.1	8.9	14.3	7.6	10.4	11.9	7.2	8.3	6.9	7.4	9.9	3.2

Temporary Threshold Shift (dB): 1350 Hz center frequency, 139 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	88.0	103.0	94.0	92.0	88.0	70.0	57.0	55.0	45.0	50.0	53.0	51.0	47.0	45.0	48.0	103.0
K110	70.0	99.0	86.0	99.0	82.0	70.0	78.0	56.0	44.0	42.0	40.0	38.0	36.0	44.0	42.0	99.0
K121	56.0	86.0	79.0	100.0	70.0	63.0	58.0	47.0	70.0	49.0	48.0	48.0	37.0	36.0	34.0	100.0
K123	64.0	64.0	84.0	84.0	64.0	54.0	32.0	40.0	38.0	36.0	36.0	34.0	32.0	30.0	38.0	84.0
K126	55.0	86.0	78.0	80.0	79.0	68.0	54.0	81.0	60.0	59.0	48.0	47.0	46.0	45.0	43.0	86.0
K134	55.0	94.0	83.0	91.0	69.0	57.0	64.0	52.0	39.0	37.0	44.0	42.0	40.0	38.0	40.0	94.0
Mean	64.7	88.7	84.0	91.0	75.3	63.7	57.2	55.2	49.3	45.5	44.8	43.3	39.7	39.7	40.8	94.3
S.D.	12.9	13.9	5.8	7.9	9.1	6.9	15.0	14.0	12.8	8.8	6.2	6.5	5.9	6.1	4.8	7.8

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	94.0	99.0	90.0	88.0	74.0	66.0	73.0	50.0	51.0	56.0	49.0	57.0	43.0	51.0	44.0	99.0
K110	66.0	95.0	90.0	95.0	78.0	56.0	64.0	62.0	60.0	58.0	46.0	44.0	32.0	40.0	38.0	95.0
K121	68.0	88.0	81.0	102.0	82.0	85.0	60.0	49.0	72.0	41.0	50.0	50.0	49.0	38.0	46.0	102.0
K123	44.0	64.0	84.0	84.0	74.0	54.0	42.0	40.0	38.0	36.0	36.0	44.0	42.0	30.0	38.0	84.0
K126	57.0	78.0	96.0	96.0	91.0	60.0	76.0	83.0	62.0	51.0	50.0	59.0	48.0	47.0	55.0	96.0
K134	73.0	82.0	81.0	79.0	77.0	55.0	52.0	50.0	37.0	45.0	42.0	40.0	28.0	26.0	38.0	82.0
Mean	67.0	84.3	87.0	90.7	79.3	62.7	61.2	55.7	53.3	47.8	45.5	49.0	40.3	38.7	43.2	93.0
S.D.	16.7	12.7	6.0	8.5	6.4	11.8	12.8	15.1	14.0	8.7	5.6	7.7	8.6	9.6	6.8	8.1

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	94.0	99.0	90.0	99.0	84.0	76.0	63.0	91.0	51.0	56.0	49.0	47.0	53.0	51.0	54.0	99.0
K110	97.0	97.0	84.0	97.0	80.0	68.0	66.0	64.0	52.0	50.0	48.0	46.0	44.0	42.0	40.0	97.0
K121	65.0	85.0	78.0	99.0	79.0	72.0	57.0	56.0	49.0	58.0	47.0	47.0	56.0	45.0	53.0	99.0
K123	54.0	64.0	99.0	84.0	64.0	54.0	42.0	40.0	38.0	36.0	36.0	44.0	42.0	30.0	38.0	99.0
K126	73.0	84.0	86.0	78.0	87.0	56.0	62.0	59.0	68.0	57.0	56.0	45.0	44.0	53.0	61.0	87.0
K134	73.0	98.0	71.0	79.0	77.0	75.0	62.0	50.0	47.0	45.0	52.0	50.0	38.0	46.0	38.0	98.0
Mean	76.0	87.8	84.7	89.3	78.5	66.8	58.7	60.0	50.8	50.3	48.0	46.5	46.2	44.5	47.3	96.5
S.D.	16.7	13.4	9.7	10.1	8.0	9.6	8.7	17.3	9.8	8.6	6.7	2.1	6.9	8.2	9.9	4.7

Temporary Threshold Shift (dB): 1350 Hz center frequency, 139 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	97.0	97.0	97.0	97.0	72.0	74.0	61.0	69.0	49.0	54.0	57.0	55.0	61.0	49.0	52.0	97.0
K110	99.0	99.0	86.0	99.0	82.0	80.0	68.0	66.0	54.0	52.0	50.0	48.0	46.0	54.0	42.0	99.0
K121	63.0	92.0	76.0	97.0	67.0	60.0	65.0	56.0	47.0	56.0	46.0	45.0	54.0	43.0	51.0	97.0
K123	54.0	74.0	99.0	99.0	64.0	44.0	42.0	30.0	28.0	26.0	36.0	34.0	32.0	30.0	38.0	99.0
K126	64.0	98.0	87.0	69.0	78.0	77.0	73.0	70.0	59.0	38.0	47.0	46.0	35.0	44.0	52.0	98.0
K134	98.0	98.0	81.0	98.0	77.0	65.0	52.0	50.0	37.0	45.0	42.0	40.0	28.0	36.0	38.0	98.0
Mean	79.2	93.0	87.7	93.2	73.3	66.7	60.2	56.8	45.7	45.2	46.3	44.7	42.7	42.7	45.5	98.0
S.D.	20.9	9.6	8.9	11.9	6.9	13.4	11.4	15.3	11.4	11.5	7.1	7.2	13.1	8.7	6.9	0.9

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	95.0	95.0	86.0	95.0	70.0	62.0	59.0	67.0	47.0	52.0	55.0	53.0	49.0	37.0	50.0	95.0
K110	97.0	97.0	84.0	97.0	80.0	78.0	66.0	54.0	62.0	50.0	38.0	36.0	34.0	42.0	40.0	97.0
K121	63.0	82.0	76.0	97.0	77.0	80.0	45.0	46.0	27.0	36.0	46.0	45.0	44.0	33.0	31.0	97.0
K123	54.0	54.0	99.0	84.0	54.0	44.0	32.0	30.0	28.0	26.0	26.0	34.0	32.0	30.0	28.0	99.0
K126	53.0	74.0	76.0	78.0	67.0	56.0	72.0	59.0	48.0	47.0	26.0	45.0	44.0	53.0	51.0	78.0
K134	59.0	88.0	77.0	65.0	63.0	51.0	38.0	36.0	33.0	31.0	38.0	36.0	14.0	22.0	24.0	88.0
Mean	70.2	81.7	83.0	86.0	68.5	61.8	52.0	48.7	40.8	40.3	38.2	41.5	36.2	36.2	37.3	92.3
S.D.	20.3	16.0	8.9	12.9	9.5	14.6	16.1	14.1	13.8	10.8	11.3	7.4	12.7	10.6	11.5	8.0

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	97.0	97.0	97.0	97.0	72.0	74.0	71.0	92.0	49.0	64.0	57.0	45.0	51.0	49.0	52.0	97.0
K110	95.0	95.0	82.0	95.0	78.0	86.0	64.0	62.0	50.0	48.0	36.0	34.0	32.0	40.0	38.0	95.0
K121	52.0	91.0	85.0	96.0	76.0	79.0	54.0	55.0	56.0	55.0	45.0	34.0	23.0	32.0	30.0	96.0
K123	54.0	64.0	99.0	99.0	64.0	34.0	32.0	30.0	18.0	26.0	26.0	34.0	32.0	30.0	28.0	99.0
K126	57.0	101.0	80.0	82.0	71.0	70.0	86.0	43.0	59.0	51.0	50.0	49.0	48.0	57.0	35.0	101.0
K134	94.0	88.0	77.0	94.0	83.0	61.0	48.0	36.0	33.0	51.0	28.0	26.0	14.0	32.0	24.0	94.0
Mean	74.8	89.3	86.7	93.8	74.0	67.3	59.2	53.0	44.2	49.2	40.3	37.0	33.3	40.0	34.5	97.0
S.D.	22.5	13.2	9.2	6.1	6.5	18.4	18.8	22.5	15.7	12.6	12.4	8.4	14.2	10.9	9.9	2.6

Temporary Threshold Shift (dB): 1350 Hz center frequency, 139 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
K104	89.0	89.0	89.0	89.0	74.0	76.0	63.0	81.0	61.0	46.0	59.0	47.0	63.0	41.0	44.0	89.0
K110	91.0	91.0	86.0	91.0	74.0	82.0	70.0	58.0	56.0	54.0	42.0	40.0	38.0	36.0	34.0	91.0
K121	55.0	89.0	89.0	89.0	59.0	52.0	57.0	38.0	29.0	48.0	38.0	37.0	16.0	25.0	33.0	89.0
K123	48.0	48.0	93.0	93.0	68.0	38.0	26.0	24.0	22.0	20.0	20.0	28.0	26.0	24.0	22.0	93.0
K126	41.0	95.0	74.0	86.0	65.0	64.0	80.0	67.0	46.0	45.0	44.0	53.0	42.0	51.0	49.0	95.0
K134	58.0	93.0	66.0	84.0	62.0	60.0	47.0	45.0	32.0	20.0	27.0	35.0	13.0	21.0	21.0	93.0
Mean	63.7	84.2	82.8	88.7	67.0	62.0	57.2	52.2	41.0	38.8	38.3	40.0	33.0	33.0	33.8	91.7
S.D.	21.2	17.9	10.5	3.3	6.2	16.0	19.0	20.6	15.7	14.9	13.7	8.9	18.7	11.7	11.3	2.4

1350 Hz center frequency, 139 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
K104	49	1718	1666	1567	4951
K110	151	1578	1548	1343	4469
K121	467	1226	1165	1018	3409
K123	13	1214	1203	1087	3504
K126	127	1977	1936	1884	5797
K134	93	1331	1324	1272	3927
Group mean	150				4343
S.D.	163				922
S.E.	67				376

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	2.8	67.3
	0.25 kHz	6.0	150.5
	0.5 kHz	10.5	536.7
	1 kHz	34.8	885.7
	2 kHz	38.0	905.8
	4 kHz	27.3	899.8
	8 kHz	26.8	584.8
	16 kHz	3.7	312.2
Standard deviations			
	0.125 kHz	3.8	41.0
	0.25 kHz	9.5	102.9
	0.5 kHz	13.0	107.5
	1 kHz	48.1	37.3
	2 kHz	43.6	38.6
	4 kHz	30.1	42.0
	8 kHz	51.7	356.5
	16 kHz	4.2	434.6

1350 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla K104							
0.125 kHz	2	11	22	24	57	0	0
0.25 kHz	2	44	32	40	116	0	0
0.5 kHz	5	213	173	61	447	0	15
1 kHz	6	292	292	291	875	0	166
2 kHz	12	299	299	299	897	0	82
4 kHz	8	294	296	292	882	0	3
8 kHz	11	296	298	297	891	0	0
16 kHz	3	269	254	263	786	1	12
TOTALS	49	1718	1666	1567	4951	1	278
Chinchilla K110							
0.125 kHz	4	2	5	18	25	0	0
0.25 kHz	1	80	87	105	272	0	9
0.5 kHz	1	242	228	87	557	0	4
1 kHz	63	302	303	292	897	70	126
2 kHz	33	287	308	298	893	57	55
4 kHz	35	307	302	277	886	0	3
8 kHz	8	298	284	247	829	0	0
16 kHz	6	60	31	19	110	0	3
TOTALS	151	1578	1548	1343	4469	127	200
Chinchilla K121							
0.125 kHz	0	6	7	42	55	0	2
0.25 kHz	0	13	4	22	39	0	0
0.5 kHz	11	217	168	38	423	0	5
1 kHz	121	301	301	283	885	274	180
2 kHz	121	309	309	307	925	189	117
4 kHz	80	304	304	264	872	2	2
8 kHz	132	75	71	61	207	0	0
16 kHz	2	1	1	1	3	0	0
TOTALS	467	1226	1165	1018	3409	465	306

1350 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla K123							
0.125 kHz	0	6	25	35	66	0	0
0.25 kHz	3	11	4	21	36	0	1
0.5 kHz	2	225	200	189	614	3	6
1 kHz	1	298	298	298	894	1	50
2 kHz	3	305	303	245	853	6	58
4 kHz	0	303	298	256	857	0	1
8 kHz	4	61	69	41	171	3	2
16 kHz	0	5	6	2	13	0	0
TOTALS	13	1214	1203	1087	3504	13	118
Chinchilla K126							
0.125 kHz	1	5	18	32	55	0	0
0.25 kHz	5	83	61	106	250	0	0
0.5 kHz	8	289	257	155	701	4	8
1 kHz	14	316	316	307	939	6	123
2 kHz	46	323	323	323	969	81	209
4 kHz	36	322	322	322	966	76	88
8 kHz	6	323	323	323	969	1	1
16 kHz	11	316	316	316	948	0	0
TOTALS	127	1977	1936	1884	5797	168	429
Chinchilla K134							
0.125 kHz	10	21	34	91	146	0	4
0.25 kHz	25	29	28	133	190	0	0
0.5 kHz	36	201	168	109	478	0	2
1 kHz	4	305	291	228	824	1	67
2 kHz	13	320	316	262	898	1	46
4 kHz	5	321	318	297	936	0	0
8 kHz	0	130	164	148	442	1	2
16 kHz	0	4	5	4	13	0	0
TOTALS	93	1331	1324	1272	3927	3	121

1350 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	2.8	8.5	18.5	40.3	67.3	0.0	1.0
0.25 kHz	6.0	43.3	36.0	71.2	150.5	0.0	1.7
0.5 kHz	10.5	231.2	199.0	106.5	536.7	1.2	6.7
1 kHz	34.8	302.3	300.2	283.2	885.7	58.7	118.7
2 kHz	38.0	307.2	309.7	289.0	905.8	55.7	94.5
4 kHz	27.3	308.5	306.7	284.7	899.8	13.0	16.2
8 kHz	26.8	197.2	201.5	186.2	584.8	0.8	0.8
16 kHz	3.7	109.2	102.2	100.8	312.2	0.2	2.5
TOTALS	150.0	1507.3	1473.7	1361.8	4342.8	129.5	242.0
Group standard deviations							
0.125 kHz	3.8	6.8	11.0	26.2	41.0	0.0	1.7
0.25 kHz	9.5	31.9	32.7	49.2	102.9	0.0	3.6
0.5 kHz	13.0	31.4	36.9	57.1	107.5	1.8	4.5
1 kHz	48.1	8.0	9.1	28.2	37.3	109.0	51.9
2 kHz	43.6	13.4	8.7	29.4	38.6	73.5	61.7
4 kHz	30.1	11.0	10.8	24.1	42.0	30.9	35.2
8 kHz	51.7	121.4	115.6	120.8	356.5	1.2	1.0
16 kHz	4.2	144.5	143.4	147.2	434.6	0.4	4.8
TOTALS	163.2	305.4	299.1	321.5	921.8	179.0	120.1

1350 Hz center frequency, 139 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla K104							
0.125 kHz	1.5	6.2	12.5	13.6	10.8	0.0	0.0
0.25 kHz	0.8	14.2	10.3	12.9	12.5	0.0	0.0
0.5 kHz	2.1	69.3	56.3	19.8	48.5	0.0	4.8
1 kHz	2.6	100.0	100.0	99.6	99.9	0.0	56.8
2 kHz	5.3	100.0	100.0	100.0	100.0	0.0	27.4
4 kHz	3.4	98.3	98.9	97.6	98.3	0.0	1.0
8 kHz	4.5	98.9	99.6	99.3	99.3	0.0	0.0
16 kHz	1.2	94.0	88.8	91.9	91.6	0.2	4.1
Chinchilla K110							
0.125 kHz	2.9	1.1	2.7	9.9	4.6	0.0	0.0
0.25 kHz	0.4	25.1	27.3	33.0	28.5	0.0	2.8
0.5 kHz	0.4	76.5	72.1	27.5	58.7	0.0	1.2
1 kHz	26.9	99.6	100.0	96.3	98.6	14.3	41.5
2 kHz	14.4	93.1	100.0	96.7	96.6	11.4	17.8
4 kHz	14.2	99.3	97.7	89.6	95.5	0.0	0.9
8 kHz	3.2	96.4	91.9	79.9	89.4	0.0	0.0
16 kHz	2.6	21.1	10.9	6.6	12.9	0.0	1.0
Chinchilla K121							
0.125 kHz	0.0	3.3	3.8	23.2	10.1	0.0	1.1
0.25 kHz	0.0	4.1	1.2	6.9	4.1	0.0	0.0
0.5 kHz	4.6	68.4	52.9	11.9	44.4	0.0	1.5
1 kHz	51.7	100.0	100.0	94.0	98.0	56.2	59.8
2 kHz	52.8	100.0	100.0	99.3	99.8	37.9	37.8
4 kHz	32.7	98.7	98.7	85.7	94.4	0.4	0.6
8 kHz	53.0	24.2	22.9	19.7	22.3	0.0	0.0
16 kHz	0.8	0.3	0.3	0.3	0.3	0.0	0.0

1350 Hz center frequency, 139 dB peak SPL

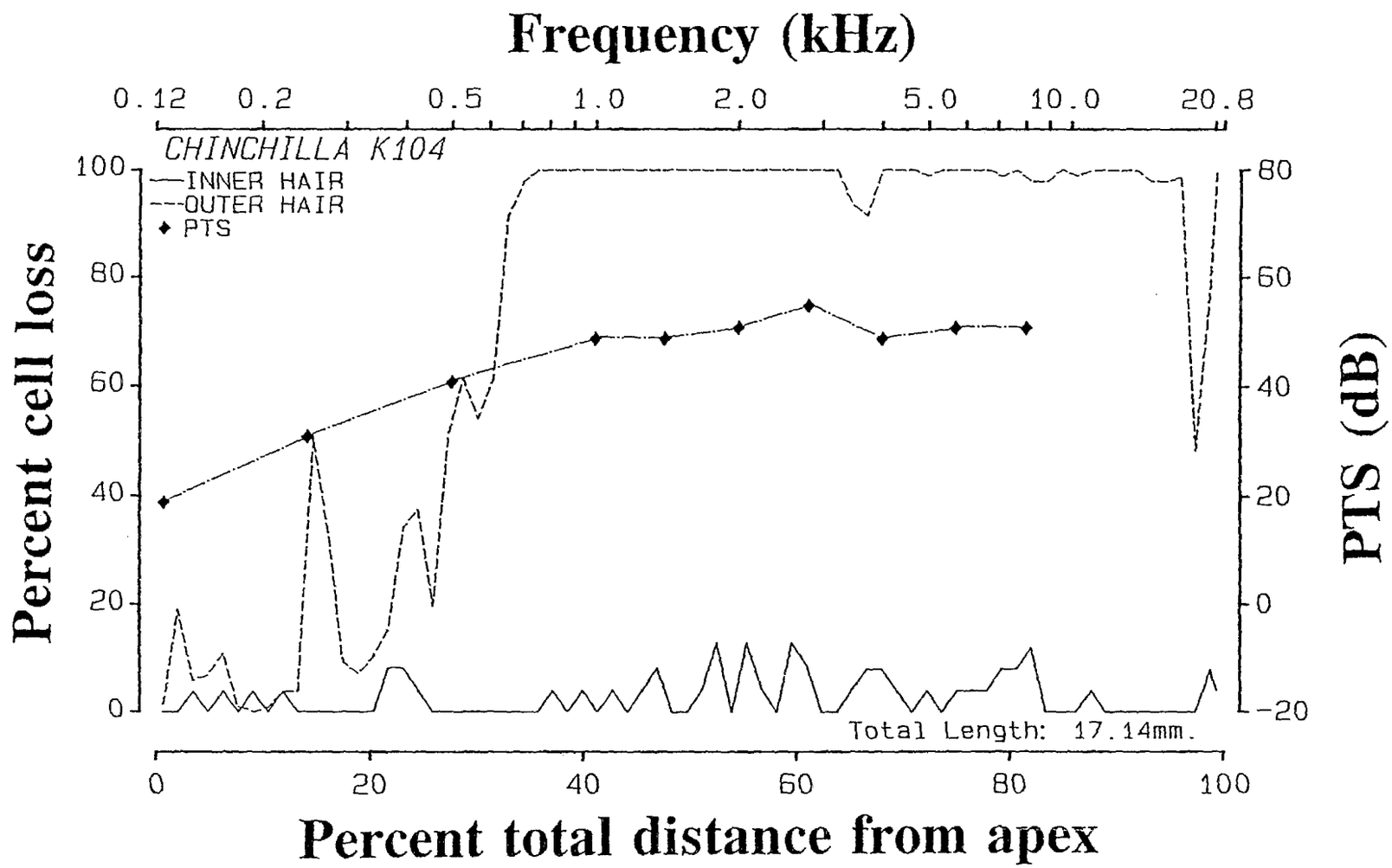
Percent sensory cell losses over octave band frequencies

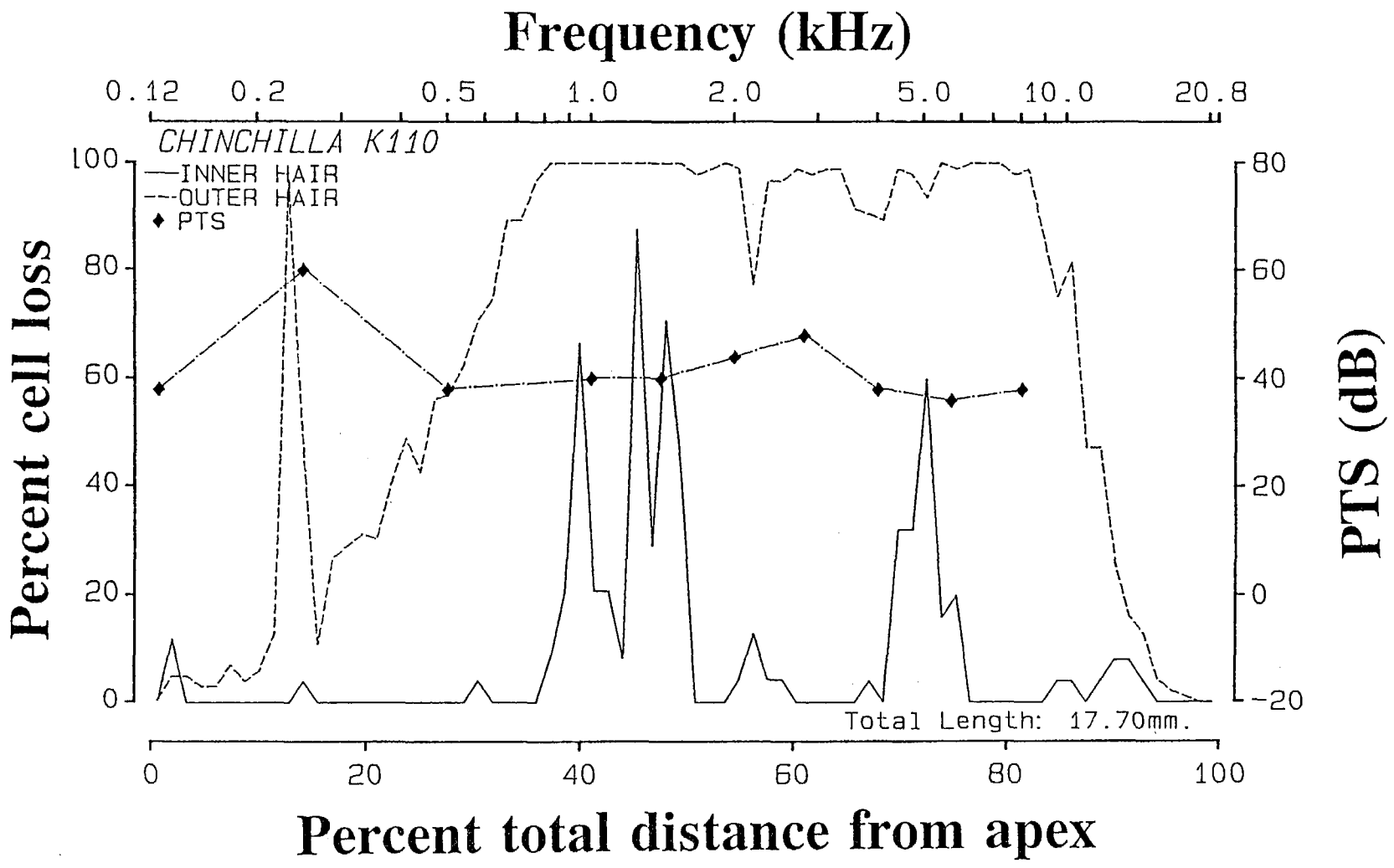
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla K123							
0.125 kHz	0.0	3.3	13.9	19.5	12.2	0.0	0.0
0.25 kHz	1.2	3.5	1.2	6.7	3.8	0.0	0.3
0.5 kHz	0.8	71.8	63.8	60.3	65.3	0.6	1.9
1 kHz	0.4	100.0	100.0	100.0	100.0	0.2	16.7
2 kHz	1.3	100.0	99.3	80.3	93.2	1.2	19.0
4 kHz	0.0	99.6	98.0	84.2	93.9	0.0	0.3
8 kHz	1.6	20.0	22.6	13.4	18.7	0.6	0.6
16 kHz	0.0	1.7	2.1	0.7	1.5	0.0	0.0
Chinchilla K126							
0.125 kHz	0.6	2.6	9.4	16.8	9.6	0.0	0.0
0.25 kHz	1.9	25.0	18.3	31.9	25.1	0.0	0.0
0.5 kHz	3.2	87.0	77.4	46.6	70.3	0.7	2.4
1 kHz	5.7	99.6	99.6	96.8	98.7	1.1	38.8
2 kHz	19.0	100.0	100.0	100.0	100.0	15.5	64.7
4 kHz	14.2	100.0	100.0	100.0	100.0	14.5	27.3
8 kHz	2.3	100.0	100.0	100.0	100.0	0.1	0.3
16 kHz	4.3	100.0	100.0	100.0	100.0	0.0	0.0
Chinchilla K134							
0.125 kHz	6.9	11.1	17.9	48.1	25.7	0.0	2.1
0.25 kHz	10.0	8.7	8.4	40.3	19.1	0.0	0.0
0.5 kHz	14.5	61.2	51.2	33.2	48.5	0.0	0.6
1 kHz	1.6	97.1	92.6	72.6	87.4	0.1	21.3
2 kHz	5.4	99.6	98.4	81.6	93.2	0.1	14.3
4 kHz	1.9	100.0	99.0	92.5	97.2	0.0	0.0
8 kHz	0.0	40.4	51.0	46.1	45.8	0.1	0.6
16 kHz	0.0	1.3	1.6	1.3	1.4	0.0	0.0

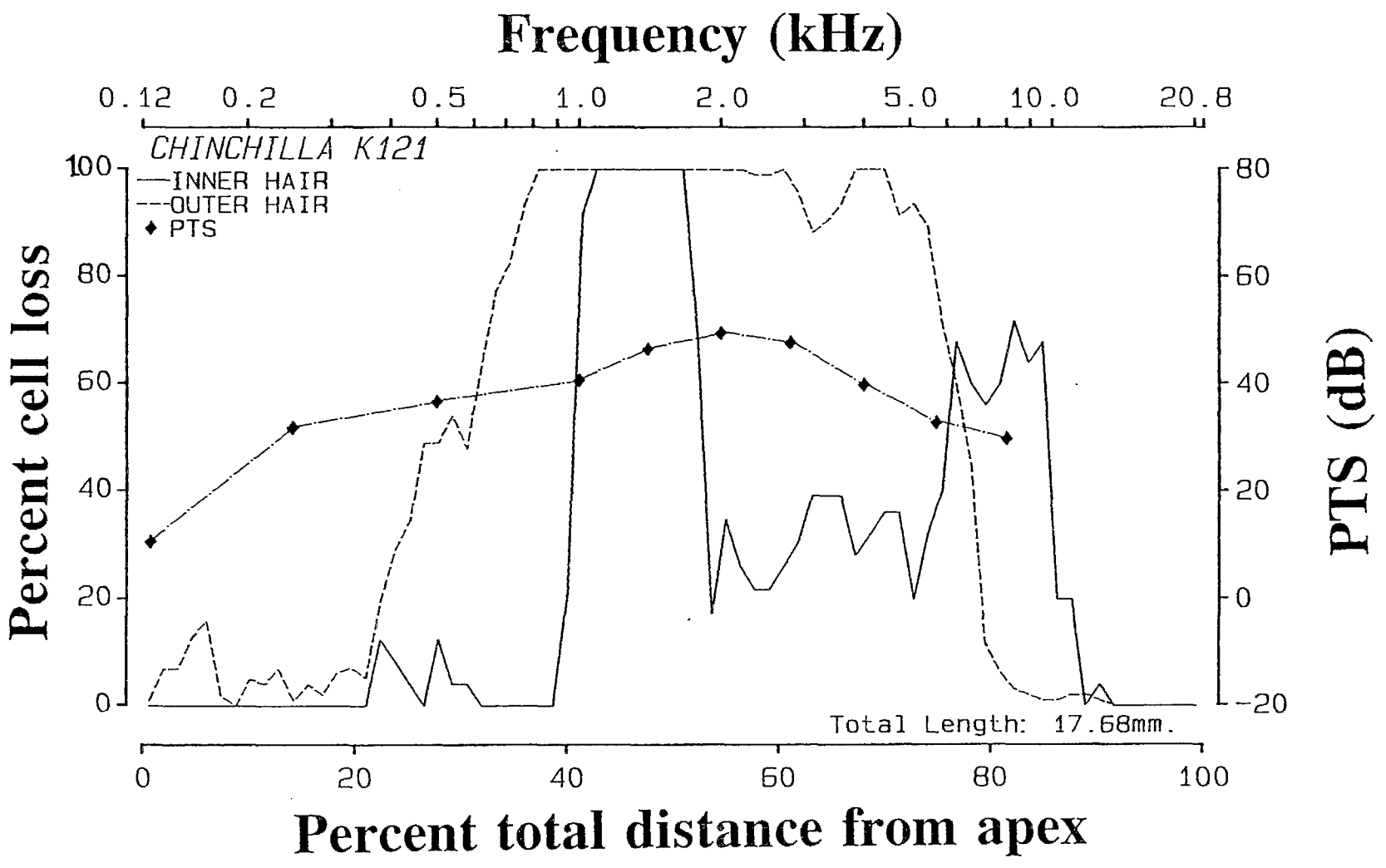
1350 Hz center frequency, 139 dB peak SPL

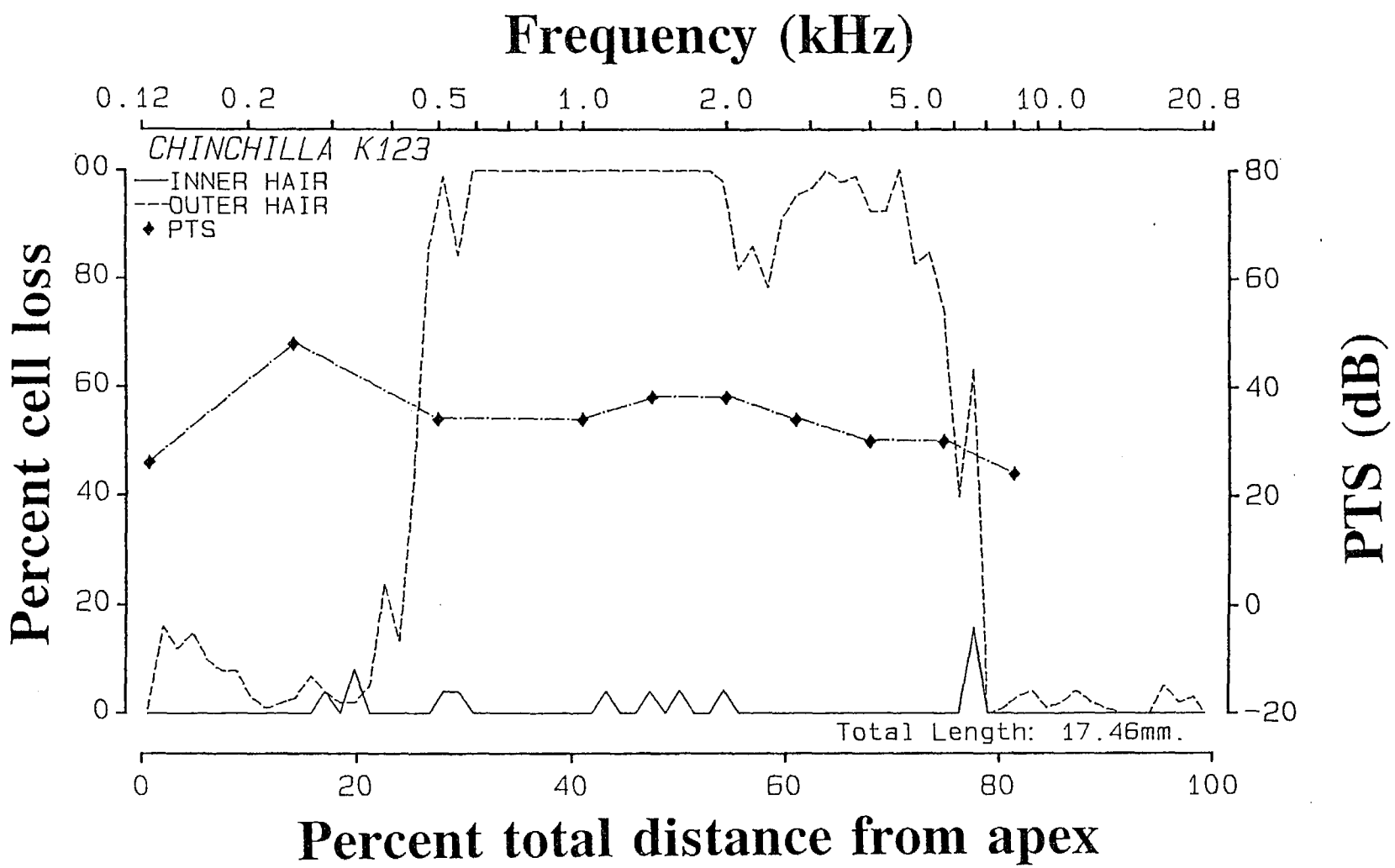
Percent sensory cell losses over octave band frequencies

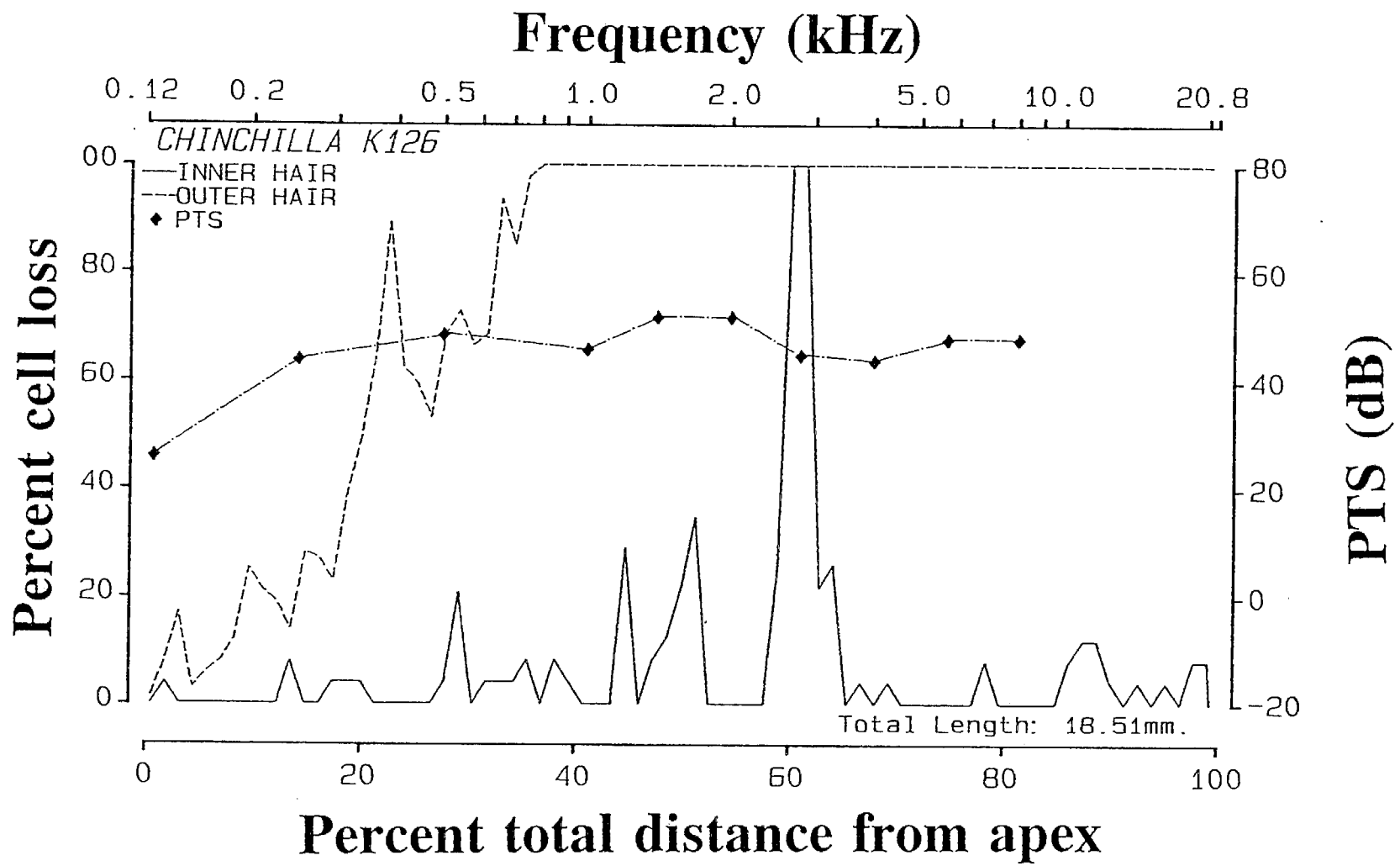
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.98	4.60	10.03	21.85	12.16	0.00	0.53
0.25 kHz	2.38	13.43	11.12	21.95	15.50	0.00	0.52
0.5 kHz	4.27	72.37	62.28	33.22	55.96	0.22	2.07
1 kHz	14.82	99.38	98.70	93.22	97.10	11.98	39.15
2 kHz	16.37	98.78	99.62	92.98	97.13	11.02	30.17
4 kHz	11.07	99.32	98.72	91.60	96.54	2.48	5.02
8 kHz	10.77	63.32	64.67	59.73	62.57	0.13	0.25
16 kHz	1.48	36.40	33.95	33.47	34.61	0.03	0.85
Group standard deviations							
0.125 kHz	2.65	3.59	5.93	13.66	7.12	0.00	0.88
0.25 kHz	3.79	9.78	10.18	14.82	10.48	0.00	1.13
0.5 kHz	5.25	8.73	10.71	17.77	10.45	0.34	1.47
1 kHz	20.60	1.14	2.99	10.34	4.80	22.37	17.70
2 kHz	19.02	2.79	0.66	9.41	3.30	14.70	18.91
4 kHz	12.27	0.70	0.81	6.34	2.36	5.89	10.92
8 kHz	20.75	39.08	37.18	38.80	38.21	0.23	0.29
16 kHz	1.68	47.62	47.11	48.52	47.68	0.08	1.64

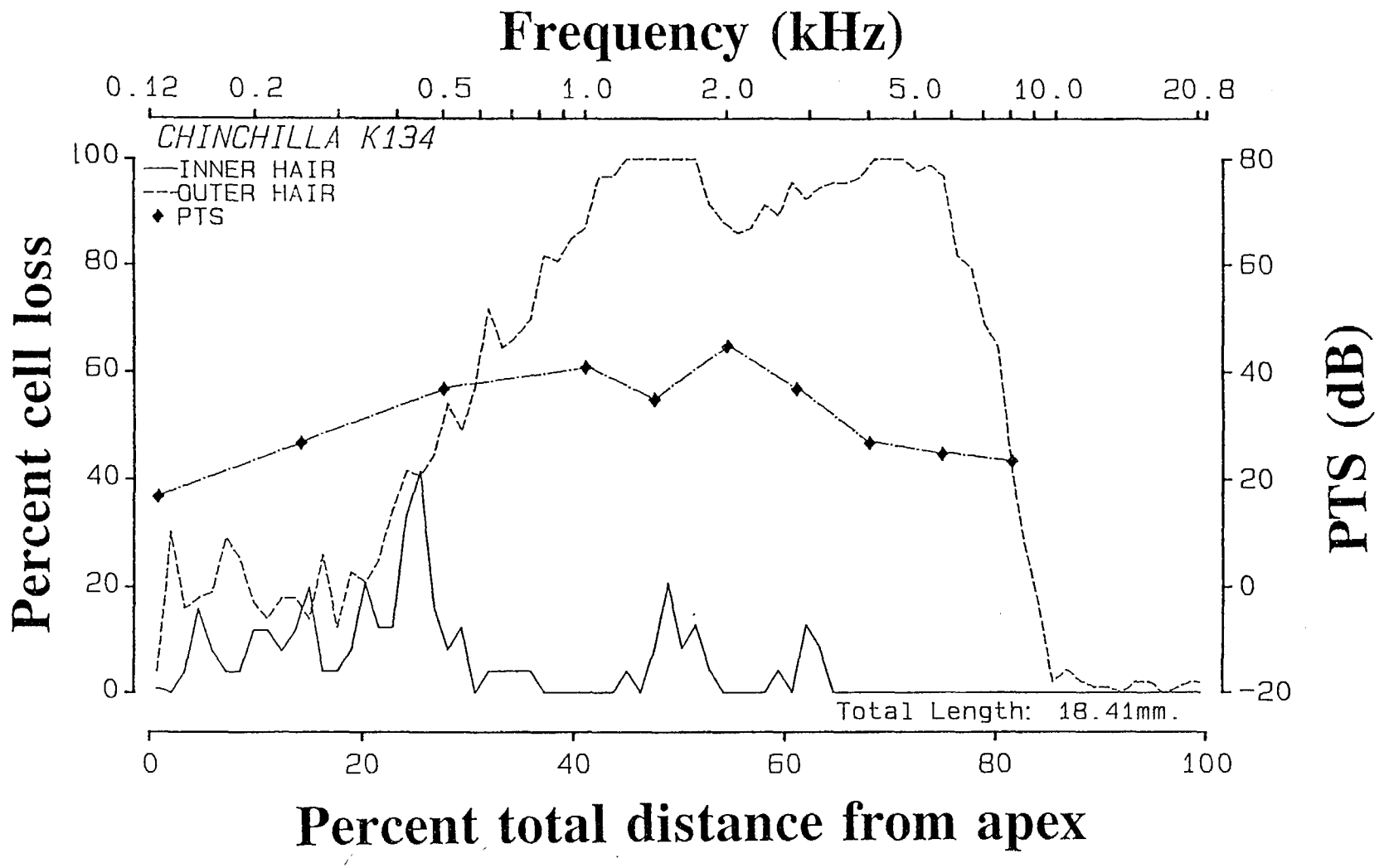

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA K104
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.14mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA K110
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.70mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA K121
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.68mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA K123
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.46mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA K126
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.51mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA K134
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.41mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

2450 Hz center frequency, 129 dB peak SPL

Animal #		
M074	-	Completed the entire protocol
M120	-	Completed the entire protocol
N31	-	Completed the entire protocol
N53	-	Completed the entire protocol
P12	-	Completed the entire protocol
P29	-	Completed the entire protocol

2450 Hz center frequency, 129 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M074	25.0	14.0	0.0	0.0	-1.0	-1.0	1.0	-1.0	8.0	5.0
M120	25.0	4.0	2.0	6.0	1.0	3.0	1.0	1.0	4.0	3.0
N31	26.0	5.0	7.0	1.0	0.0	2.0	2.0	0.0	3.0	2.0
N53	19.0	8.0	2.0	4.0	-3.0	-1.0	1.0	3.0	-2.0	9.0
P12	21.0	10.0	2.0	2.0	1.0	1.0	3.0	1.0	2.0	7.0
P29	26.0	9.0	0.0	3.0	4.0	2.0	2.0	2.0	3.0	6.0
Mean	23.7	8.3	2.2	2.7	0.3	1.0	1.7	1.0	3.0	5.3
S.D.	2.9	3.6	2.6	2.2	2.3	1.7	0.8	1.4	3.2	2.6

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M074	20.8	5.8	-0.2	-2.2	0.8	0.8	0.8	2.8	9.8	2.8
M120	25.0	4.0	4.0	2.0	3.0	5.0	1.0	1.0	2.0	3.0
N31	25.0	4.0	6.0	4.0	3.0	1.0	3.0	1.0	0.0	1.0
N53	19.0	10.0	0.0	4.0	5.0	1.0	5.0	1.0	4.0	9.0
P12	33.4	18.4	16.4	7.4	9.2	11.4	21.4	6.4	19.4	13.4
P29	25.2	14.2	8.2	10.2	11.6	11.2	9.2	5.2	8.2	7.2
Mean	24.7	9.4	5.7	4.2	5.4	5.1	6.7	2.9	7.2	6.1
S.D.	5.0	5.9	6.2	4.3	4.1	5.1	7.8	2.4	7.0	4.7

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M074	-4.2	-8.2	-0.2	-2.2	1.8	1.8	-0.2	3.8	1.8	-2.2
M120	0.0	0.0	2.0	-4.0	2.0	2.0	0.0	0.0	-2.0	0.0
N31	-1.0	-1.0	-1.0	3.0	3.0	-1.0	1.0	1.0	-3.0	-1.0
N53	0.0	2.0	-2.0	0.0	8.0	2.0	4.0	-2.0	6.0	0.0
P12	12.4	8.4	14.4	5.4	8.2	10.4	18.4	5.4	17.4	6.4
P29	-0.8	5.2	8.2	7.2	7.6	9.2	7.2	3.2	5.2	1.2
Mean	1.1	1.1	3.6	1.6	5.1	4.1	5.1	1.9	4.2	0.7
S.D.	5.8	5.7	6.4	4.4	3.1	4.6	7.1	2.7	7.4	3.0

Temporary Threshold Shift (dB): 2450 Hz center frequency, 129 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	-1.0	7.0	5.0	4.0	3.0	1.0	-1.0	-3.0	-5.0	-6.0	-8.0	0.0	-2.0	-4.0	-7.0	7.0
M120	2.0	0.0	-2.0	6.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	6.0
N31	3.0	1.0	-1.0	-3.0	-5.0	-7.0	1.0	-1.0	-1.0	-3.0	-5.0	3.0	1.0	-1.0	-3.0	3.0
N53	12.0	9.0	7.0	5.0	3.0	1.0	0.0	9.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	12.0
P12	34.0	33.0	0.0	4.0	36.0	25.0	36.0	0.0	34.0	3.0	43.0	3.0	2.0	11.0	3.0	43.0
P29	3.0	22.0	-9.0	7.0	-4.0	1.0	10.0	2.0	-1.0	-2.0	-3.0	0.0	6.0	-5.0	-2.0	22.0
Mean	8.8	12.0	0.0	3.8	5.5	3.2	7.0	0.2	4.5	-2.0	4.8	0.7	1.8	0.2	-2.2	15.5
S.D.	13.1	13.0	5.7	3.5	15.3	11.1	15.0	5.1	14.6	3.2	19.1	2.7	2.9	5.8	3.4	15.0

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	11.0	9.0	7.0	6.0	15.0	13.0	-9.0	-1.0	-13.0	-4.0	-6.0	-8.0	-10.0	-12.0	-5.0	15.0
M120	14.0	2.0	0.0	-2.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	14.0
N31	15.0	3.0	1.0	-1.0	-3.0	5.0	3.0	1.0	1.0	-1.0	-3.0	-5.0	3.0	1.0	-1.0	15.0
N53	24.0	31.0	9.0	7.0	5.0	3.0	2.0	1.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	31.0
P12	16.0	15.0	11.0	3.0	28.0	27.0	18.0	3.0	6.0	25.0	35.0	-5.0	4.0	3.0	5.0	35.0
P29	31.0	10.0	40.0	5.0	4.0	9.0	8.0	10.0	-3.0	-4.0	5.0	8.0	4.0	3.0	6.0	40.0
Mean	18.5	11.7	11.3	3.0	8.5	9.5	3.3	3.3	-0.8	2.7	6.2	-1.3	-0.2	-0.2	0.8	25.0
S.D.	7.5	10.6	14.7	3.7	11.2	9.7	9.2	4.0	6.7	11.2	14.9	6.1	5.7	6.0	4.3	11.7

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	9.0	27.0	25.0	14.0	-7.0	1.0	-1.0	7.0	5.0	4.0	2.0	0.0	-2.0	6.0	-7.0	27.0
M120	10.0	-2.0	-4.0	4.0	-2.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	10.0
N31	7.0	5.0	-7.0	1.0	-1.0	-3.0	-5.0	3.0	3.0	1.0	-1.0	7.0	-5.0	-7.0	1.0	7.0
N53	24.0	31.0	-1.0	-3.0	-5.0	-4.0	2.0	1.0	0.0	8.0	-4.0	-6.0	2.0	0.0	-2.0	31.0
P12	28.0	27.0	5.0	7.0	20.0	49.0	10.0	3.0	8.0	7.0	7.0	17.0	16.0	15.0	17.0	49.0
P29	14.0	23.0	12.0	18.0	17.0	22.0	11.0	3.0	0.0	-1.0	8.0	1.0	7.0	16.0	9.0	23.0
Mean	15.3	18.5	5.0	6.8	3.7	11.8	3.5	3.2	2.7	2.8	3.0	3.8	3.3	5.0	2.7	24.5
S.D.	8.7	13.6	11.9	7.9	11.7	20.5	6.2	2.0	3.3	4.2	4.8	7.8	7.4	9.1	8.8	15.3

Temporary Threshold Shift (dB): 2450 Hz center frequency, 129 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	21.0	9.0	17.0	6.0	5.0	3.0	1.0	9.0	7.0	6.0	4.0	-8.0	0.0	-2.0	-5.0	21.0
M120	8.0	-4.0	4.0	-8.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	-8.0	0.0	-2.0	-4.0	8.0
N31	5.0	3.0	1.0	9.0	-3.0	5.0	-7.0	1.0	1.0	-1.0	7.0	5.0	3.0	1.0	-1.0	9.0
N53	14.0	21.0	-1.0	7.0	-5.0	-4.0	2.0	1.0	0.0	-2.0	6.0	4.0	-8.0	0.0	-2.0	21.0
P12	30.0	49.0	6.0	4.0	12.0	31.0	22.0	3.0	10.0	9.0	9.0	-6.0	8.0	7.0	9.0	49.0
P29	13.0	22.0	11.0	7.0	16.0	11.0	0.0	2.0	-1.0	8.0	7.0	10.0	6.0	-5.0	18.0	22.0
Mean	15.2	16.7	6.3	4.2	3.5	6.7	3.3	2.7	2.5	2.7	4.5	-0.5	1.5	-0.2	2.5	21.7
S.D.	9.1	18.8	6.7	6.2	9.0	13.4	9.8	3.3	4.8	5.7	5.4	7.8	5.7	4.1	9.1	14.8

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	21.0	19.0	7.0	16.0	5.0	3.0	1.0	9.0	7.0	6.0	4.0	2.0	0.0	8.0	-5.0	21.0
M120	2.0	10.0	8.0	6.0	0.0	-2.0	-4.0	4.0	2.0	10.0	-2.0	6.0	4.0	2.0	0.0	10.0
N31	5.0	13.0	11.0	-1.0	7.0	-5.0	3.0	1.0	1.0	9.0	-3.0	5.0	3.0	1.0	9.0	13.0
N53	10.0	27.0	5.0	3.0	1.0	-1.0	8.0	-3.0	6.0	4.0	12.0	10.0	8.0	6.0	4.0	27.0
P12	30.0	29.0	10.0	6.0	42.0	31.0	42.0	4.0	20.0	19.0	8.0	9.0	8.0	7.0	9.0	42.0
P29	21.0	10.0	19.0	5.0	4.0	9.0	-2.0	10.0	7.0	16.0	5.0	8.0	14.0	5.0	6.0	21.0
Mean	14.8	18.0	10.0	5.8	9.8	5.8	8.0	4.2	7.2	10.7	4.0	6.7	6.2	4.8	3.8	22.3
S.D.	10.9	8.4	4.9	5.6	16.0	13.2	17.2	4.9	6.8	5.8	5.8	2.9	4.9	2.8	5.5	11.4

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	11.0	19.0	17.0	6.0	5.0	3.0	1.0	-1.0	-3.0	6.0	4.0	2.0	0.0	8.0	-5.0	19.0
M120	0.0	-2.0	-4.0	4.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	6.0
N31	13.0	11.0	-1.0	-3.0	-5.0	3.0	1.0	-1.0	-1.0	-3.0	-5.0	3.0	1.0	-1.0	-3.0	13.0
N53	8.0	15.0	3.0	1.0	-1.0	-3.0	6.0	-5.0	4.0	12.0	0.0	-2.0	6.0	4.0	2.0	15.0
P12	40.0	29.0	5.0	5.0	42.0	61.0	22.0	-1.0	30.0	9.0	9.0	19.0	8.0	7.0	9.0	61.0
P29	23.0	32.0	11.0	17.0	26.0	11.0	10.0	2.0	9.0	-2.0	7.0	10.0	6.0	15.0	8.0	32.0
Mean	15.8	17.3	5.2	5.0	10.8	11.8	5.7	-0.7	6.5	3.3	3.5	6.0	3.8	5.5	1.5	24.3
S.D.	14.0	12.4	7.8	6.7	18.9	24.7	9.6	2.6	12.3	6.5	5.2	7.5	3.3	5.9	5.9	19.9

Temporary Threshold Shift (dB): 2450 Hz center frequency, 129 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	9.0	7.0	-5.0	4.0	3.0	11.0	9.0	-3.0	5.0	4.0	2.0	0.0	-2.0	-4.0	3.0	11.0
M120	2.0	0.0	-2.0	-4.0	0.0	-2.0	6.0	4.0	2.0	10.0	-2.0	-4.0	4.0	2.0	0.0	10.0
N31	3.0	1.0	-1.0	-3.0	5.0	-7.0	1.0	-1.0	-1.0	-3.0	5.0	3.0	1.0	-1.0	-3.0	5.0
N53	6.0	23.0	11.0	9.0	-13.0	-5.0	-6.0	3.0	2.0	0.0	-2.0	-4.0	4.0	12.0	10.0	23.0
P12	48.0	37.0	11.0	7.0	40.0	69.0	30.0	3.0	18.0	17.0	37.0	7.0	6.0	25.0	17.0	69.0
P29	33.0	52.0	52.0	27.0	16.0	21.0	10.0	12.0	9.0	8.0	7.0	10.0	6.0	5.0	8.0	52.0
Mean	16.8	20.0	11.0	6.7	8.5	14.5	8.3	3.0	5.8	6.0	7.8	2.0	3.2	6.5	5.8	28.3
S.D.	19.1	21.2	21.2	11.3	18.0	28.8	12.1	5.2	6.8	7.2	14.7	5.8	3.1	10.6	7.3	26.2

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	21.0	9.0	7.0	6.0	5.0	3.0	11.0	9.0	-3.0	6.0	4.0	2.0	0.0	8.0	5.0	21.0
M120	12.0	0.0	-2.0	-4.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	12.0
N31	15.0	3.0	1.0	-1.0	-3.0	5.0	3.0	1.0	1.0	-1.0	-3.0	5.0	3.0	1.0	-1.0	15.0
N53	-6.0	11.0	-11.0	-3.0	-15.0	-7.0	2.0	1.0	0.0	-2.0	6.0	-6.0	2.0	0.0	-12.0	11.0
P12	10.0	19.0	3.0	3.0	42.0	51.0	22.0	3.0	20.0	9.0	9.0	-6.0	8.0	-3.0	19.0	51.0
P29	13.0	52.0	21.0	17.0	16.0	11.0	10.0	2.0	9.0	8.0	7.0	0.0	6.0	-5.0	8.0	52.0
Mean	10.8	15.7	3.2	3.0	7.5	11.8	9.0	3.3	4.8	3.3	3.5	-1.5	3.8	0.5	3.2	27.0
S.D.	9.1	19.0	10.6	7.8	19.7	20.1	7.3	3.0	8.4	4.9	4.9	4.6	2.9	4.5	10.3	19.3

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	11.0	9.0	7.0	6.0	5.0	3.0	1.0	-1.0	7.0	6.0	4.0	2.0	0.0	8.0	-5.0	11.0
M120	8.0	6.0	4.0	-8.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	-4.0	8.0
N31	11.0	-1.0	-3.0	5.0	3.0	1.0	9.0	-3.0	-3.0	-5.0	-7.0	1.0	-1.0	-3.0	-5.0	11.0
N53	8.0	25.0	3.0	-5.0	-1.0	-3.0	-4.0	-5.0	14.0	2.0	10.0	8.0	6.0	4.0	2.0	25.0
P12	8.0	37.0	8.0	4.0	50.0	49.0	20.0	0.0	18.0	17.0	47.0	-8.0	16.0	15.0	17.0	50.0
P29	41.0	20.0	30.0	25.0	4.0	9.0	8.0	10.0	7.0	6.0	5.0	8.0	4.0	3.0	6.0	41.0
Mean	14.5	16.0	8.2	4.5	9.5	8.8	6.0	0.2	6.8	3.7	8.8	2.2	4.2	4.2	1.8	24.3
S.D.	13.1	14.0	11.4	11.6	20.1	20.3	8.4	5.2	8.4	8.1	19.8	5.9	6.4	6.7	8.7	17.7

Temporary Threshold Shift (dB): 2450 Hz center frequency, 129 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M074	19.0	17.0	25.0	14.0	3.0	-9.0	-1.0	-3.0	5.0	4.0	-8.0	0.0	-2.0	-4.0	3.0	25.0
M120	4.0	2.0	0.0	-2.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	4.0
N31	7.0	5.0	3.0	1.0	-1.0	-3.0	5.0	3.0	3.0	1.0	-1.0	-3.0	-5.0	3.0	1.0	7.0
N53	12.0	9.0	-3.0	-5.0	-7.0	1.0	0.0	-1.0	-2.0	-14.0	4.0	2.0	0.0	-2.0	-4.0	12.0
P12	8.0	17.0	13.0	7.0	20.0	49.0	17.0	-1.0	8.0	-3.0	7.0	7.0	6.0	5.0	7.0	49.0
P29	33.0	82.0	42.0	27.0	16.0	31.0	0.0	2.0	-1.0	8.0	-3.0	10.0	6.0	-5.0	-2.0	82.0
Mean	13.8	22.0	13.3	7.0	5.5	11.5	3.2	-0.7	2.8	-0.3	-0.2	2.3	0.2	0.2	1.2	29.8
S.D.	10.7	30.0	17.4	11.9	10.4	23.1	7.2	2.7	3.8	7.6	5.3	5.2	4.8	4.4	3.9	30.4

2450 Hz center frequency, 129 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
M074	11	44	58	52	154
M120	26	41	57	183	281
N31	7	52	73	93	218
N53	28	47	45	66	158
P12	15	44	33	43	120
P29	12	52	33	39	124
Group mean	17				176
S.D.	9				62
S.E.	3				25

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.5	45.2
	0.25 kHz	2.0	34.2
	0.5 kHz	1.5	18.5
	1 kHz	1.5	18.0
	2 kHz	2.0	13.5
	4 kHz	1.2	16.0
	8 kHz	4.0	13.3
	16 kHz	2.8	17.2
Standard deviations			
	0.125 kHz	1.4	30.7
	0.25 kHz	1.1	36.0
	0.5 kHz	1.4	10.4
	1 kHz	1.8	7.9
	2 kHz	1.4	5.2
	4 kHz	1.2	9.8
	8 kHz	7.5	9.8
	16 kHz	2.9	11.1

2450 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M074							
0.125 kHz	4	5	1	9	15	0	2
0.25 kHz	4	6	8	4	18	0	0
0.5 kHz	1	3	4	2	9	0	0
1 kHz	0	2	5	0	7	0	0
2 kHz	0	1	3	5	9	0	0
4 kHz	1	10	12	11	33	3	2
8 kHz	1	7	12	11	30	0	0
16 kHz	0	10	13	10	33	0	1
TOTALS	11	44	58	52	154	3	5
Chinchilla M120							
0.125 kHz	0	14	27	47	88	0	0
0.25 kHz	2	2	15	89	106	0	0
0.5 kHz	1	2	0	26	28	1	0
1 kHz	0	6	9	10	25	0	0
2 kHz	2	5	1	5	11	0	0
4 kHz	2	6	3	2	11	0	1
8 kHz	19	5	2	1	8	2	0
16 kHz	0	1	0	3	4	0	0
TOTALS	26	41	57	183	281	3	1
Chinchilla N31D							
0.125 kHz	1	8	10	37	55	1	1
0.25 kHz	2	9	7	18	34	2	2
0.5 kHz	0	17	8	9	34	7	8
1 kHz	0	7	15	5	27	0	1
2 kHz	3	1	16	4	21	0	0
4 kHz	0	1	9	6	16	0	0
8 kHz	0	2	7	10	19	0	1
16 kHz	1	7	1	4	12	0	0
TOTALS	7	52	73	93	218	10	13

2450 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla N53D							
0.125 kHz	2	17	17	34	68	1	0
0.25 kHz	2	2	8	9	19	0	0
0.5 kHz	4	5	7	5	17	0	0
1 kHz	4	3	2	7	12	0	0
2 kHz	4	12	3	4	19	3	2
4 kHz	3	1	5	2	8	0	0
8 kHz	4	5	1	0	6	0	0
16 kHz	5	2	2	5	9	0	0
TOTALS	28	47	45	66	158	4	2
Chinchilla P12D							
0.125 kHz	1	5	9	21	35	1	1
0.25 kHz	1	4	3	7	14	1	1
0.5 kHz	2	3	2	3	8	0	0
1 kHz	2	11	5	6	22	2	0
2 kHz	2	8	4	0	12	0	0
4 kHz	0	2	4	1	7	0	0
8 kHz	0	3	1	0	4	0	0
16 kHz	7	8	5	5	18	0	0
TOTALS	15	44	33	43	120	4	2
Chinchilla P29D							
0.125 kHz	1	1	0	9	10	0	0
0.25 kHz	1	4	3	7	14	0	0
0.5 kHz	1	4	6	5	15	0	0
1 kHz	3	7	3	5	15	0	0
2 kHz	1	6	2	1	9	0	0
4 kHz	1	11	8	2	21	0	0
8 kHz	0	10	1	2	13	1	0
16 kHz	4	9	10	8	27	1	1
TOTALS	12	52	33	39	124	2	1

2450 Hz center frequency, 129 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.5	8.3	10.7	26.2	45.2	0.5	0.7
0.25 kHz	2.0	4.5	7.3	22.3	34.2	0.5	0.5
0.5 kHz	1.5	5.7	4.5	8.3	18.5	1.3	1.3
1 kHz	1.5	6.0	6.5	5.5	18.0	0.3	0.2
2 kHz	2.0	5.5	4.8	3.2	13.5	0.5	0.3
4 kHz	1.2	5.2	6.8	4.0	16.0	0.5	0.5
8 kHz	4.0	5.3	4.0	4.0	13.3	0.5	0.2
16 kHz	2.8	6.2	5.2	5.8	17.2	0.2	0.3
TOTALS	16.5	46.7	49.8	79.3	175.8	4.3	4.0
Group standard deviations							
0.125 kHz	1.4	6.1	10.2	15.7	30.7	0.5	0.8
0.25 kHz	1.1	2.7	4.4	33.0	36.0	0.8	0.8
0.5 kHz	1.4	5.6	3.1	9.0	10.4	2.8	3.3
1 kHz	1.8	3.2	4.8	3.3	7.9	0.8	0.4
2 kHz	1.4	4.2	5.6	2.1	5.2	1.2	0.8
4 kHz	1.2	4.5	3.4	3.8	9.8	1.2	0.8
8 kHz	7.5	2.9	4.6	5.1	9.8	0.8	0.4
16 kHz	2.9	3.8	5.3	2.6	11.1	0.4	0.5
TOTALS	8.5	4.5	15.8	54.4	62.3	2.9	4.6

2450 Hz center frequency, 129 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M074							
0.125 kHz	2.7	2.6	0.5	4.7	2.6	0.0	1.0
0.25 kHz	1.6	1.8	2.4	1.2	1.8	0.0	0.0
0.5 kHz	0.4	0.9	1.2	0.6	0.9	0.0	0.0
1 kHz	0.0	0.6	1.5	0.0	0.7	0.0	0.0
2 kHz	0.0	0.3	0.9	1.5	0.9	0.0	0.0
4 kHz	0.3	3.1	3.7	3.4	3.4	0.5	0.6
8 kHz	0.3	2.1	3.7	3.4	3.1	0.0	0.0
16 kHz	0.0	3.3	4.3	3.3	3.6	0.0	0.3
Chinchilla M120							
0.125 kHz	0.0	7.6	14.7	25.6	16.0	0.0	0.0
0.25 kHz	0.8	0.6	4.6	27.8	11.0	0.0	0.0
0.5 kHz	0.4	0.6	0.0	8.1	2.9	0.1	0.0
1 kHz	0.0	1.9	2.9	3.2	2.7	0.0	0.0
2 kHz	0.8	1.6	0.3	1.6	1.2	0.0	0.0
4 kHz	0.8	1.9	0.9	0.6	1.1	0.0	0.3
8 kHz	7.5	1.6	0.6	0.3	0.8	0.3	0.0
16 kHz	0.0	0.3	0.0	1.0	0.4	0.0	0.0
Chinchilla N31D							
0.125 kHz	0.7	4.5	5.6	21.0	10.4	0.3	0.5
0.25 kHz	0.8	2.9	2.2	5.8	3.6	0.4	0.6
0.5 kHz	0.0	5.5	2.5	2.9	3.6	1.4	2.5
1 kHz	0.0	2.3	5.1	1.7	3.0	0.0	0.3
2 kHz	1.3	0.3	5.3	1.3	2.3	0.0	0.0
4 kHz	0.0	0.3	3.0	2.0	1.8	0.0	0.0
8 kHz	0.0	0.6	2.3	3.3	2.1	0.0	0.3
16 kHz	0.4	2.5	0.3	1.4	1.4	0.0	0.0

2450 Hz center frequency, 129 dB peak SPL

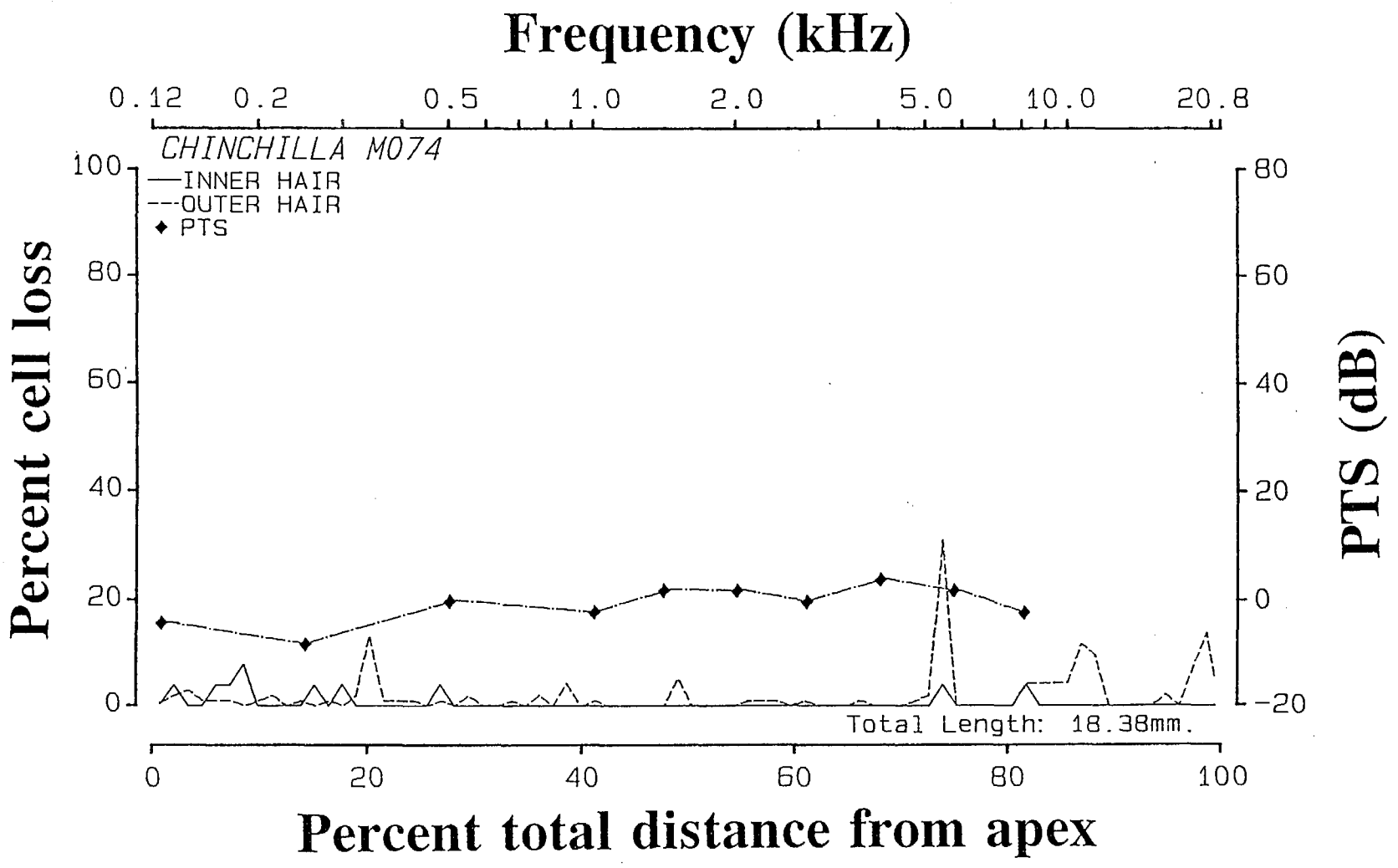
Percent sensory cell losses over octave band frequencies

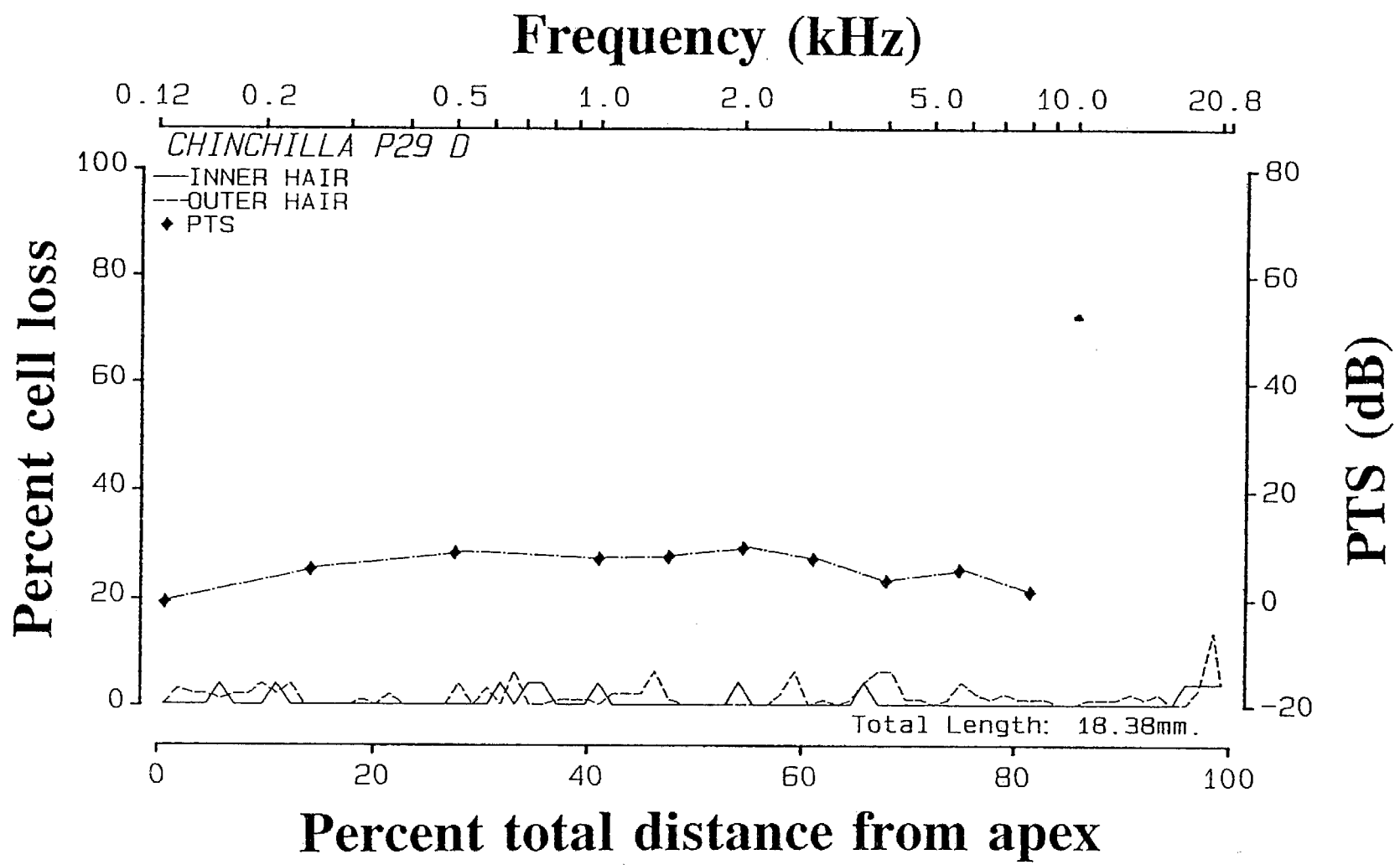
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla N53D							
0.125 kHz	1.3	8.8	8.8	17.6	11.7	0.3	0.0
0.25 kHz	0.7	0.5	2.3	2.6	1.8	0.0	0.0
0.5 kHz	1.5	1.4	2.0	1.4	1.6	0.0	0.0
1 kHz	1.6	0.9	0.6	2.1	1.2	0.0	0.0
2 kHz	1.6	3.6	0.9	1.2	1.9	0.5	0.6
4 kHz	1.1	0.3	1.5	0.6	0.8	0.0	0.0
8 kHz	1.5	1.5	0.3	0.0	0.6	0.0	0.0
16 kHz	2.0	0.6	0.6	1.6	0.9	0.0	0.0
Chinchilla P12D							
0.125 kHz	0.6	2.5	4.5	10.5	5.8	0.3	0.5
0.25 kHz	0.3	1.1	0.8	1.9	1.3	0.1	0.2
0.5 kHz	0.7	0.8	0.5	0.8	0.7	0.0	0.0
1 kHz	0.7	3.2	1.4	1.7	2.1	0.3	0.0
2 kHz	0.7	2.3	1.1	0.0	1.1	0.0	0.0
4 kHz	0.0	0.5	1.1	0.2	0.6	0.0	0.0
8 kHz	0.0	0.8	0.2	0.0	0.3	0.0	0.0
16 kHz	2.7	2.5	1.5	1.5	1.8	0.0	0.0
Chinchilla P29D							
0.125 kHz	0.6	0.5	0.0	4.7	1.7	0.0	0.0
0.25 kHz	0.4	1.2	0.9	2.1	1.4	0.0	0.0
0.5 kHz	0.4	1.2	1.8	1.5	1.5	0.0	0.0
1 kHz	1.2	2.2	0.9	1.5	1.5	0.0	0.0
2 kHz	0.4	1.8	0.6	0.3	0.9	0.0	0.0
4 kHz	0.3	3.4	2.5	0.6	2.2	0.0	0.0
8 kHz	0.0	3.1	0.3	0.6	1.3	0.1	0.0
16 kHz	1.6	3.0	3.3	2.6	3.0	0.2	0.3

2450 Hz center frequency, 129 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	0.98	4.42	5.68	14.02	8.04	0.15	0.33
0.25 kHz	0.77	1.35	2.20	6.90	3.48	0.08	0.13
0.5 kHz	0.57	1.73	1.33	2.55	1.87	0.25	0.42
1 kHz	0.58	1.85	2.07	1.70	1.87	0.05	0.05
2 kHz	0.80	1.65	1.52	0.98	1.38	0.08	0.10
4 kHz	0.42	1.58	2.12	1.23	1.64	0.08	0.15
8 kHz	1.55	1.62	1.23	1.27	1.37	0.07	0.05
16 kHz	1.12	2.03	1.67	1.90	1.87	0.03	0.10
Group standard deviations							
0.125 kHz	0.94	3.21	5.51	8.74	5.59	0.16	0.41
0.25 kHz	0.46	0.89	1.38	10.36	3.78	0.16	0.24
0.5 kHz	0.51	1.87	0.95	2.84	1.16	0.56	1.02
1 kHz	0.70	0.96	1.68	1.03	0.89	0.12	0.12
2 kHz	0.58	1.26	1.87	0.67	0.58	0.20	0.24
4 kHz	0.44	1.43	1.13	1.23	1.04	0.20	0.25
8 kHz	2.97	0.91	1.44	1.63	1.03	0.12	0.12
16 kHz	1.14	1.27	1.76	0.87	1.22	0.08	0.15


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M074
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.38mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P29 D
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.38mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

2450 Hz center frequency, 134 dB peak SPL

Animal #		
M090	-	Completed the entire protocol
M093	-	Completed the entire protocol
M094	-	Completed the entire protocol
N15	-	Completed the entire protocol
N26	-	Completed the entire protocol
N71	-	Completed the entire protocol

2450 Hz center frequency, 134 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M090	23.0	2.0	4.0	6.0	3.0	3.0	0.0	3.0	4.0	1.0
M093	24.0	13.0	-3.0	-3.0	-4.0	0.0	0.0	8.0	7.0	2.0
M094	25.0	4.0	4.0	2.0	5.0	3.0	3.0	5.0	6.0	1.0
N15	24.0	3.0	5.0	3.0	4.0	0.0	2.0	4.0	1.0	2.0
N26	24.0	7.0	5.0	3.0	2.0	0.0	-2.0	2.0	7.0	6.0
N71	24.0	9.0	-1.0	-3.0	0.0	-2.0	-2.0	2.0	3.0	-2.0
Mean	24.0	6.3	2.3	1.3	1.7	0.7	0.2	4.0	4.7	1.7
S.D.	0.6	4.2	3.4	3.6	3.3	2.0	2.0	2.3	2.4	2.6

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M090	25.0	6.0	8.0	2.0	9.0	1.0	3.0	5.0	6.0	1.0
M093	37.0	36.0	34.0	44.0	39.0	35.0	31.0	23.0	22.0	17.0
M094	26.0	15.0	15.0	7.0	10.0	6.0	14.0	12.0	11.0	14.0
N15	32.2	11.2	15.2	19.2	22.2	16.2	16.2	14.2	19.2	12.2
N26	25.0	20.0	18.0	14.0	21.0	13.0	11.0	11.0	28.0	19.4
N71	24.0	5.0	3.0	5.0	2.0	2.0	9.4	0.0	5.0	2.0
Mean	28.2	15.5	15.5	15.2	17.2	12.2	14.1	10.9	15.2	10.9
S.D.	5.2	11.5	10.6	15.4	13.1	12.7	9.4	7.9	9.3	7.7

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
M090	2.0	4.0	4.0	-4.0	6.0	-2.0	3.0	2.0	2.0	0.0
M093	13.0	23.0	37.0	47.0	43.0	35.0	31.0	15.0	15.0	15.0
M094	1.0	11.0	11.0	5.0	5.0	3.0	11.0	7.0	5.0	13.0
N15	8.2	8.2	10.2	16.2	18.2	16.2	14.2	10.2	18.2	10.2
N26	1.0	13.0	13.0	11.0	19.0	13.0	13.0	9.0	21.0	13.4
N71	0.0	-4.0	4.0	8.0	2.0	4.0	11.4	-2.0	2.0	4.0
Mean	4.2	9.2	13.2	13.9	15.5	11.5	13.9	6.9	10.5	9.3
S.D.	5.2	9.1	12.2	17.6	15.2	13.3	9.2	6.1	8.5	6.0

Temporary Threshold Shift (dB): 2450 Hz center frequency, 134 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	14.0	12.0	10.0	28.0	26.0	14.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	6.0	28.0
M093	37.0	26.0	35.0	34.0	43.0	32.0	31.0	30.0	19.0	8.0	7.0	16.0	15.0	14.0	13.0	43.0
M094	33.0	31.0	19.0	17.0	5.0	4.0	2.0	0.0	-2.0	-4.0	3.0	1.0	-1.0	-3.0	5.0	33.0
N15	32.0	30.0	38.0	26.0	34.0	22.0	20.0	8.0	6.0	4.0	12.0	0.0	9.0	6.0	14.0	38.0
N26	25.0	23.0	31.0	29.0	37.0	24.0	12.0	10.0	8.0	6.0	5.0	3.0	1.0	-1.0	-3.0	37.0
N71	1.0	0.0	-1.0	-2.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	5.0
Mean	23.7	20.3	22.0	22.0	23.8	15.5	10.5	8.8	5.5	3.8	5.5	3.8	4.0	2.2	5.5	30.7
S.D.	13.7	12.1	15.4	13.0	18.3	13.1	13.2	11.1	7.8	4.2	3.6	6.1	6.5	6.6	7.2	13.5

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	36.0	24.0	32.0	30.0	28.0	16.0	14.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	8.0	36.0
M093	39.0	38.0	47.0	46.0	55.0	54.0	43.0	32.0	31.0	20.0	29.0	28.0	27.0	16.0	15.0	55.0
M094	25.0	33.0	21.0	29.0	47.0	56.0	44.0	22.0	10.0	8.0	15.0	13.0	11.0	9.0	7.0	56.0
N15	34.0	32.0	30.0	48.0	46.0	44.0	22.0	30.0	18.0	16.0	24.0	2.0	1.0	8.0	6.0	48.0
N26	33.0	31.0	49.0	47.0	65.0	52.0	30.0	28.0	26.0	34.0	23.0	21.0	9.0	7.0	5.0	65.0
N71	7.0	-14.0	-5.0	-5.0	4.0	3.0	-8.0	11.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	11.0
Mean	29.0	24.0	29.0	32.5	40.8	37.5	24.2	20.8	14.2	14.2	15.8	10.8	7.7	5.8	5.8	45.2
S.D.	11.8	19.1	19.8	20.3	21.8	22.5	19.6	11.9	13.1	12.1	11.9	12.0	10.9	7.4	6.8	19.3

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	28.0	16.0	24.0	22.0	20.0	18.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	28.0
M093	49.0	48.0	47.0	56.0	55.0	44.0	43.0	42.0	41.0	40.0	39.0	38.0	37.0	36.0	35.0	56.0
M094	39.0	27.0	15.0	23.0	21.0	30.0	38.0	26.0	4.0	2.0	9.0	7.0	15.0	13.0	11.0	39.0
N15	26.0	34.0	52.0	40.0	38.0	46.0	34.0	42.0	30.0	18.0	16.0	4.0	13.0	10.0	8.0	52.0
N26	49.0	27.0	45.0	43.0	61.0	38.0	26.0	14.0	12.0	10.0	19.0	7.0	15.0	13.0	11.0	61.0
N71	1.0	0.0	9.0	8.0	-2.0	7.0	-4.0	5.0	14.0	3.0	2.0	1.0	10.0	9.0	-2.0	14.0
Mean	32.0	25.3	32.0	32.0	32.2	30.5	23.8	22.2	17.2	12.2	15.5	10.5	15.7	13.8	10.5	41.7
S.D.	18.1	16.3	18.3	17.4	23.8	15.4	18.8	17.3	15.3	15.2	13.0	13.7	11.2	11.6	13.2	18.1

Temporary Threshold Shift (dB): 2450 Hz center frequency, 134 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	38.0	16.0	24.0	22.0	10.0	8.0	6.0	4.0	-8.0	0.0	-2.0	-4.0	-6.0	-8.0	0.0	38.0
M093	51.0	40.0	49.0	48.0	57.0	46.0	35.0	44.0	43.0	42.0	41.0	50.0	49.0	48.0	47.0	57.0
M094	33.0	21.0	19.0	17.0	25.0	14.0	22.0	10.0	8.0	6.0	3.0	1.0	9.0	7.0	5.0	33.0
N15	50.0	48.0	56.0	54.0	62.0	40.0	38.0	26.0	24.0	32.0	20.0	18.0	17.0	14.0	12.0	62.0
N26	53.0	41.0	49.0	47.0	65.0	42.0	30.0	18.0	16.0	14.0	13.0	11.0	9.0	7.0	15.0	65.0
N71	5.0	4.0	23.0	22.0	2.0	21.0	-10.0	9.0	8.0	7.0	6.0	15.0	4.0	3.0	12.0	23.0
Mean	38.3	28.3	36.7	35.0	36.8	28.5	20.2	18.5	15.2	16.8	13.5	15.2	13.7	11.8	15.2	46.3
S.D.	18.2	17.2	16.4	16.4	28.0	16.2	18.7	14.7	17.3	16.5	15.5	19.0	18.9	19.1	16.5	17.3

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	40.0	18.0	26.0	34.0	22.0	10.0	8.0	-4.0	4.0	2.0	10.0	8.0	6.0	4.0	2.0	40.0
M093	51.0	50.0	29.0	58.0	57.0	46.0	45.0	44.0	43.0	42.0	41.0	40.0	39.0	48.0	47.0	58.0
M094	29.0	27.0	25.0	13.0	11.0	20.0	18.0	6.0	4.0	2.0	9.0	7.0	5.0	3.0	1.0	29.0
N15	48.0	36.0	54.0	62.0	60.0	48.0	36.0	34.0	32.0	20.0	28.0	16.0	15.0	12.0	20.0	62.0
N26	43.0	41.0	69.0	57.0	75.0	52.0	30.0	28.0	26.0	24.0	23.0	21.0	19.0	17.0	15.0	75.0
N71	1.0	0.0	19.0	8.0	-2.0	-3.0	-4.0	5.0	4.0	13.0	2.0	1.0	0.0	-1.0	8.0	19.0
Mean	35.3	28.7	37.0	38.7	37.2	28.8	22.2	18.8	18.8	17.2	18.8	15.5	14.0	13.8	15.5	47.2
S.D.	18.5	17.9	19.8	24.0	31.0	23.0	18.3	19.1	17.1	15.2	14.5	13.9	14.1	18.0	17.1	21.4

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	30.0	18.0	26.0	34.0	12.0	20.0	8.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	34.0
M093	47.0	46.0	65.0	64.0	53.0	52.0	41.0	40.0	39.0	38.0	37.0	36.0	35.0	34.0	33.0	65.0
M094	21.0	19.0	17.0	15.0	23.0	22.0	10.0	8.0	6.0	4.0	1.0	-1.0	7.0	5.0	3.0	23.0
N15	32.0	40.0	48.0	56.0	64.0	42.0	30.0	28.0	16.0	24.0	22.0	10.0	19.0	16.0	14.0	64.0
N26	55.0	43.0	71.0	69.0	77.0	54.0	52.0	30.0	28.0	16.0	15.0	13.0	11.0	9.0	17.0	77.0
N71	23.0	12.0	11.0	10.0	-10.0	9.0	8.0	17.0	6.0	15.0	4.0	3.0	2.0	11.0	0.0	23.0
Mean	34.7	29.7	39.7	41.3	36.5	33.2	24.8	19.8	16.5	16.5	13.2	9.8	11.7	11.5	11.5	47.7
S.D.	13.5	14.9	25.4	25.4	33.5	18.7	19.0	16.1	14.3	13.3	14.5	14.1	13.9	13.3	12.6	23.8

Temporary Threshold Shift (dB): 2450 Hz center frequency, 134 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	33.0	31.0	29.0	37.0	25.0	23.0	11.0	9.0	-3.0	5.0	3.0	1.0	-1.0	7.0	5.0	37.0
M093	37.0	36.0	55.0	44.0	63.0	42.0	41.0	40.0	39.0	28.0	27.0	26.0	35.0	34.0	33.0	63.0
M094	31.0	19.0	37.0	15.0	23.0	22.0	20.0	8.0	6.0	4.0	11.0	19.0	17.0	5.0	3.0	37.0
N15	30.0	38.0	56.0	64.0	62.0	50.0	18.0	26.0	14.0	22.0	20.0	8.0	17.0	14.0	12.0	64.0
N26	47.0	45.0	83.0	71.0	79.0	76.0	64.0	52.0	40.0	28.0	17.0	15.0	13.0	11.0	9.0	83.0
N71	3.0	12.0	11.0	21.0	0.0	9.0	8.0	17.0	16.0	15.0	24.0	13.0	9.0	1.0	10.0	24.0
Mean	30.2	30.2	45.2	42.0	42.0	37.0	27.0	25.3	18.7	17.0	17.0	13.7	15.0	12.0	12.0	51.3
S.D.	14.7	12.4	25.1	22.5	30.4	24.2	21.5	17.7	17.5	10.8	8.8	8.7	11.9	11.7	10.8	22.2

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	20.0	18.0	26.0	34.0	12.0	10.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	34.0
M093	19.0	18.0	27.0	36.0	25.0	14.0	23.0	12.0	11.0	10.0	9.0	18.0	17.0	16.0	15.0	36.0
M094	19.0	37.0	25.0	13.0	11.0	20.0	8.0	6.0	14.0	12.0	9.0	7.0	5.0	3.0	11.0	37.0
N15	8.0	16.0	34.0	52.0	60.0	28.0	16.0	24.0	22.0	30.0	18.0	6.0	5.0	12.0	10.0	60.0
N26	33.0	31.0	69.0	57.0	75.0	62.0	30.0	18.0	16.0	14.0	13.0	11.0	9.0	7.0	5.0	75.0
N71	-1.0	8.0	7.0	16.0	6.0	5.0	4.0	13.0	12.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	16.0
Mean	16.3	21.3	31.3	34.7	31.5	23.2	14.8	13.2	13.2	11.5	8.2	6.5	6.7	6.5	6.5	43.0
S.D.	11.6	10.6	20.5	18.0	29.0	20.6	10.1	7.0	5.9	10.5	7.1	7.5	6.2	6.8	6.9	21.0

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	38.0	16.0	34.0	42.0	20.0	18.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	42.0
M093	9.0	8.0	27.0	36.0	25.0	4.0	23.0	12.0	11.0	10.0	9.0	18.0	7.0	26.0	15.0	36.0
M094	17.0	25.0	33.0	21.0	9.0	18.0	16.0	14.0	12.0	10.0	7.0	5.0	3.0	1.0	9.0	33.0
N15	20.0	28.0	36.0	44.0	62.0	30.0	18.0	36.0	24.0	32.0	20.0	18.0	17.0	14.0	22.0	62.0
N26	27.0	35.0	63.0	71.0	59.0	56.0	44.0	32.0	20.0	28.0	27.0	25.0	23.0	21.0	9.0	71.0
N71	-3.0	6.0	15.0	15.0	-6.0	3.0	2.0	1.0	10.0	-1.0	8.0	-3.0	6.0	-5.0	4.0	15.0
Mean	18.0	19.7	34.7	38.2	28.2	21.5	18.2	16.5	13.2	13.2	11.5	11.5	10.0	9.8	9.8	43.2
S.D.	14.2	11.6	15.8	19.8	27.2	19.7	14.9	14.4	7.8	13.9	10.3	10.5	8.1	12.4	7.8	20.4

Temporary Threshold Shift (dB): 2450 Hz center frequency, 134 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M090	26.0	24.0	22.0	40.0	28.0	16.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	40.0
M093	19.0	18.0	27.0	36.0	35.0	14.0	23.0	22.0	21.0	10.0	9.0	18.0	17.0	26.0	5.0	36.0
M094	27.0	25.0	33.0	21.0	19.0	18.0	16.0	24.0	12.0	10.0	7.0	5.0	13.0	21.0	19.0	33.0
N15	4.0	22.0	30.0	38.0	56.0	34.0	22.0	20.0	18.0	16.0	14.0	12.0	11.0	8.0	6.0	56.0
N26	13.0	11.0	49.0	47.0	75.0	52.0	30.0	28.0	16.0	14.0	23.0	21.0	9.0	7.0	7.0	75.0
N71	7.0	6.0	15.0	15.0	4.0	3.0	2.0	11.0	20.0	19.0	-2.0	7.0	6.0	5.0	4.0	20.0
Mean	16.0	17.7	29.3	32.8	36.2	22.8	16.2	17.8	14.5	11.2	7.8	11.2	9.7	11.2	6.5	43.3
S.D.	9.6	7.7	11.5	12.2	25.7	17.4	11.1	9.6	7.8	7.3	10.1	7.1	5.3	10.1	6.9	19.4

2450 Hz center frequency, 134 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total* outer hair cells
M090	37	126	158	178	462
M093	116	408	417	296	1121
M094	45	164	171	141	476
N15	201	390	536	457	1383
N26	95	234	230	349	813
N71	6	11	21	18	50
Group mean	83				718
S.D.	70				487
S.E.	29				199

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	2.2	49.3
	0.25 kHz	0.7	39.0
	0.5 kHz	1.3	41.8
	1 kHz	37.8	211.8
	2 kHz	31.7	231.5
	4 kHz	1.3	37.5
	8 kHz	7.3	68.5
	16 kHz	1.0	38.0
Standard deviations			
	0.125 kHz	3.0	28.6
	0.25 kHz	0.8	24.2
	0.5 kHz	0.8	24.9
	1 kHz	44.0	205.3
	2 kHz	47.0	258.4
	4 kHz	1.0	37.3
	8 kHz	10.1	64.6
	16 kHz	1.1	25.5

2450 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M090							
0.125 kHz	0	4	14	42	60	0	0
0.25 kHz	0	9	11	23	43	0	1
0.5 kHz	0	14	26	16	56	0	0
1 kHz	19	50	51	50	151	46	29
2 kHz	0	5	14	8	27	0	0
4 kHz	1	7	4	3	14	0	0
8 kHz	14	33	35	33	101	2	2
16 kHz	3	4	3	3	10	0	1
TOTALS	37	126	158	178	462	48	33
Chinchilla M093							
0.125 kHz	1	7	4	12	23	0	3
0.25 kHz	0	15	8	11	34	0	1
0.5 kHz	1	14	12	19	45	0	0
1 kHz	105	193	188	159	540	208	126
2 kHz	4	120	133	45	298	6	5
4 kHz	3	32	29	17	78	4	4
8 kHz	1	16	9	6	31	0	0
16 kHz	1	11	34	27	72	0	2
TOTALS	116	408	417	296	1121	218	141
Chinchilla M094							
0.125 kHz	8	9	15	32	56	4	10
0.25 kHz	0	17	7	11	35	1	0
0.5 kHz	2	19	41	16	76	0	0
1 kHz	3	15	20	10	45	1	1
2 kHz	5	6	6	10	22	0	0
4 kHz	1	21	6	1	28	0	0
8 kHz	25	64	63	55	182	40	28
16 kHz	1	13	13	6	32	0	0
TOTALS	45	164	171	141	476	46	39

2450 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla N15D							
0.125 kHz	2	5	23	70	98	0	1
0.25 kHz	1	16	2	57	75	0	0
0.5 kHz	2	5	6	25	36	0	0
1 kHz	81	117	135	118	370	165	96
2 kHz	110	208	261	158	627	208	130
4 kHz	2	23	64	3	90	0	0
8 kHz	2	8	33	19	60	0	0
16 kHz	1	8	12	7	27	0	0
TOTALS	201	390	536	457	1383	373	227
Chinchilla N26D							
0.125 kHz	2	5	2	29	36	0	0
0.25 kHz	2	3	2	42	47	0	0
0.5 kHz	1	3	4	30	37	0	0
1 kHz	17	46	55	62	163	37	19
2 kHz	70	160	137	118	415	147	94
4 kHz	1	2	5	8	15	0	0
8 kHz	2	4	4	25	33	0	0
16 kHz	0	11	21	35	67	0	0
TOTALS	95	234	230	349	813	184	113
Chinchilla N71D							
0.125 kHz	0	1	12	10	23	0	0
0.25 kHz	1	0	0	0	0	0	0
0.5 kHz	2	0	1	0	1	0	0
1 kHz	2	1	1	0	2	0	0
2 kHz	1	0	0	0	0	0	0
4 kHz	0	0	0	0	0	0	0
8 kHz	0	2	1	1	4	0	0
16 kHz	0	7	6	7	20	0	0
TOTALS	6	11	21	18	50	0	0

2450 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	2.2	5.2	11.7	32.5	49.3	0.7	2.3
0.25 kHz	0.7	10.0	5.0	24.0	39.0	0.2	0.3
0.5 kHz	1.3	9.2	15.0	17.7	41.8	0.0	0.0
1 kHz	37.8	70.3	75.0	66.5	211.8	76.2	45.2
2 kHz	31.7	83.2	91.8	56.5	231.5	60.2	38.2
4 kHz	1.3	14.2	18.0	5.3	37.5	0.7	0.7
8 kHz	7.3	21.2	24.2	23.2	68.5	7.0	5.0
16 kHz	1.0	9.0	14.8	14.2	38.0	0.0	0.5
TOTALS	83.3	222.2	255.5	239.8	717.5	144.8	92.2
Group standard deviations							
0.125 kHz	3.0	2.7	7.7	22.1	28.6	1.6	3.9
0.25 kHz	0.8	7.2	4.3	21.6	24.2	0.4	0.5
0.5 kHz	0.8	7.5	15.5	10.3	24.9	0.0	0.0
1 kHz	44.0	72.2	71.9	61.8	205.3	88.5	53.0
2 kHz	47.0	91.5	104.1	66.2	258.4	92.9	58.3
4 kHz	1.0	13.0	24.8	6.3	37.3	1.6	1.6
8 kHz	10.1	23.8	24.0	19.6	64.6	16.2	11.3
16 kHz	1.1	3.3	11.3	13.4	25.5	0.0	0.8
TOTALS	70.2	155.0	188.2	158.1	486.6	140.8	84.6

2450 Hz center frequency, 134 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M090							
0.125 kHz	0.0	2.3	8.2	24.8	11.8	0.0	0.0
0.25 kHz	0.0	3.0	3.7	7.7	4.8	0.0	0.3
0.5 kHz	0.0	4.7	8.8	5.4	6.3	0.0	0.0
1 kHz	8.7	17.6	18.0	17.6	17.7	10.1	10.2
2 kHz	0.0	1.7	4.8	2.7	3.1	0.0	0.0
4 kHz	0.4	2.4	1.3	1.0	1.6	0.0	0.0
8 kHz	6.0	11.4	12.1	11.4	11.6	0.4	0.6
16 kHz	1.4	1.5	1.1	1.1	1.2	0.0	0.3
Chinchilla M093							
0.125 kHz	0.7	3.7	2.1	6.3	4.0	0.0	1.5
0.25 kHz	0.0	4.5	2.4	3.3	3.4	0.0	0.3
0.5 kHz	0.4	4.2	3.6	5.7	4.5	0.0	0.0
1 kHz	43.5	61.6	60.0	50.7	57.4	41.1	40.2
2 kHz	1.6	37.5	41.5	14.0	31.0	1.1	1.5
4 kHz	1.1	9.9	9.0	5.2	8.0	0.7	1.2
8 kHz	0.3	5.0	2.8	1.8	3.2	0.0	0.0
16 kHz	0.4	3.6	11.2	8.9	7.9	0.0	0.6
Chinchilla M094							
0.125 kHz	5.4	4.6	7.7	16.5	9.6	1.3	5.1
0.25 kHz	0.0	5.0	2.0	3.2	3.4	0.1	0.0
0.5 kHz	0.7	5.6	12.1	4.7	7.5	0.0	0.0
1 kHz	1.2	4.6	6.2	3.1	4.6	0.1	0.3
2 kHz	2.0	1.8	1.8	3.0	2.2	0.0	0.0
4 kHz	0.3	6.3	1.8	0.3	2.8	0.0	0.0
8 kHz	9.4	19.5	19.2	16.7	18.5	7.5	8.5
16 kHz	0.3	4.1	4.1	1.9	3.4	0.0	0.0

2450 Hz center frequency, 134 dB peak SPL

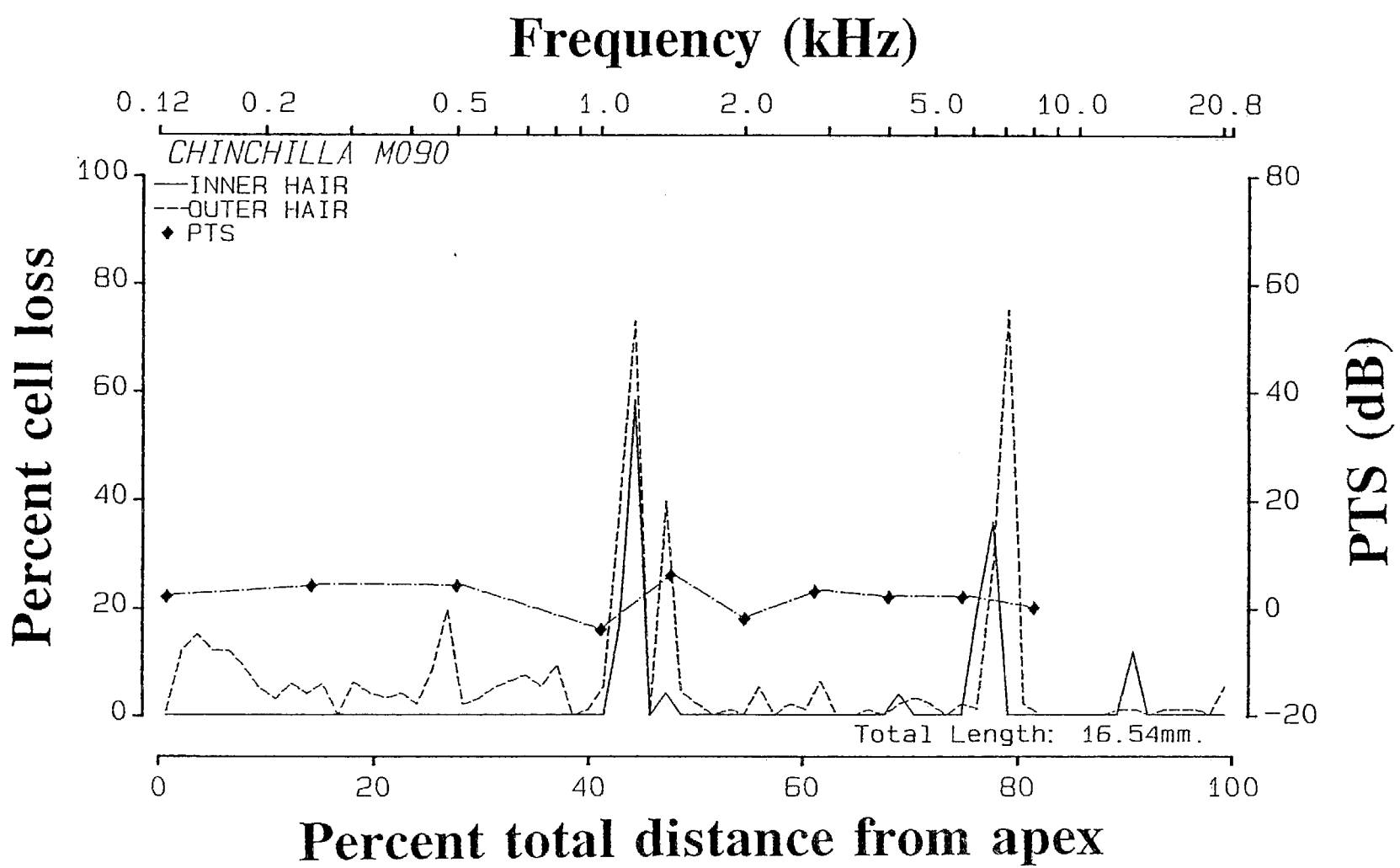
Percent sensory cell losses over octave band frequencies

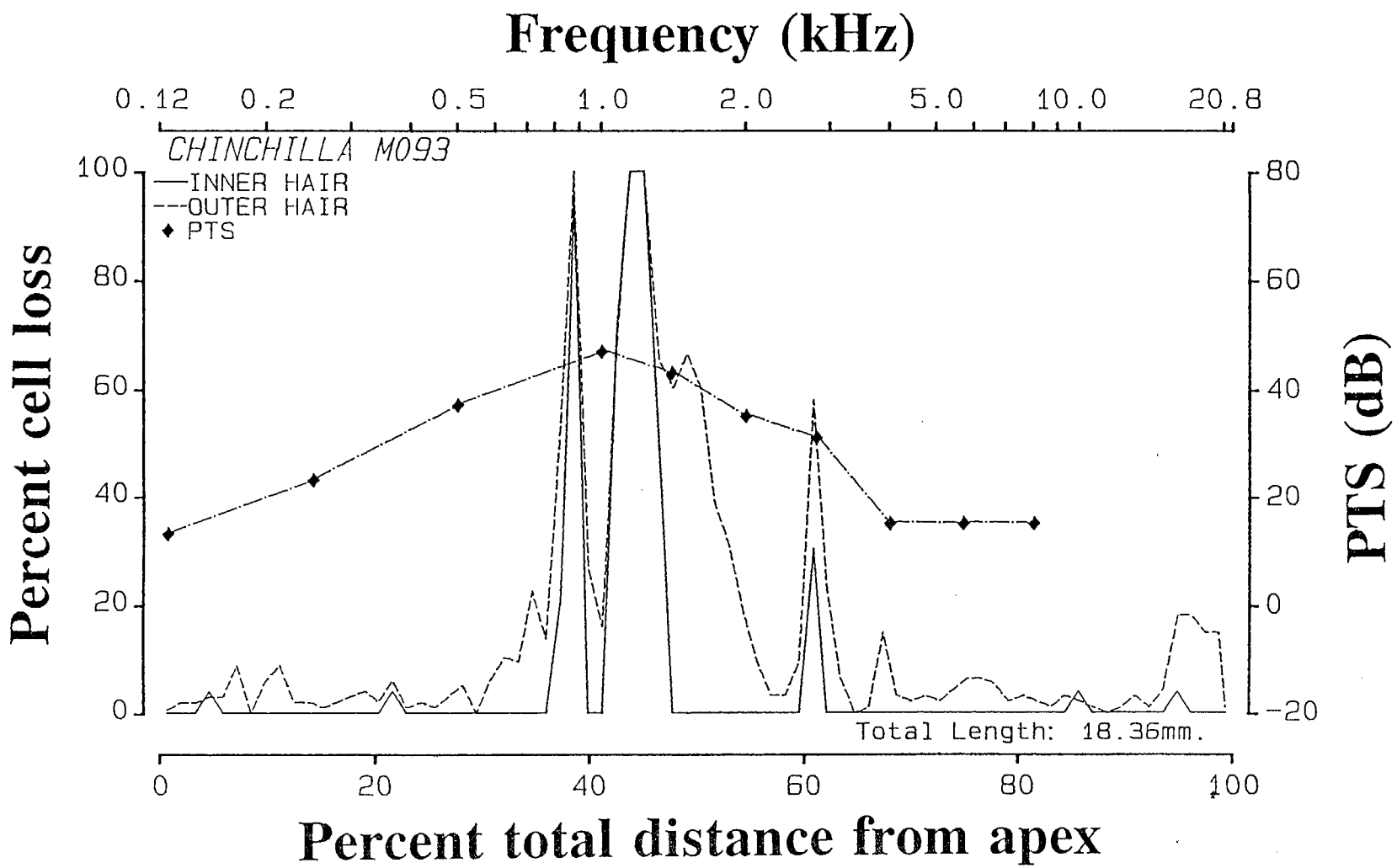
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla N15D							
0.125 kHz	1.3	2.6	12.1	37.0	17.2	0.0	0.5
0.25 kHz	0.4	4.8	0.6	17.1	7.5	0.0	0.0
0.5 kHz	0.8	1.5	1.8	7.5	3.6	0.0	0.0
1 kHz	33.4	37.1	42.8	37.4	39.1	32.4	30.4
2 kHz	45.8	64.3	80.8	48.9	64.7	40.0	40.2
4 kHz	0.7	7.1	19.8	0.9	9.3	0.0	0.0
8 kHz	0.7	2.4	10.2	5.9	6.2	0.0	0.0
16 kHz	0.4	2.7	4.1	2.4	3.1	0.0	0.0
Chinchilla N26D							
0.125 kHz	1.4	2.7	1.0	15.9	6.5	0.0	0.0
0.25 kHz	0.8	0.9	0.6	13.2	4.9	0.0	0.0
0.5 kHz	0.4	0.9	1.2	9.4	3.8	0.0	0.0
1 kHz	7.2	15.1	18.1	20.4	17.9	7.5	6.2
2 kHz	30.4	51.6	44.1	38.0	44.6	29.4	30.3
4 kHz	0.4	0.6	1.6	2.5	1.6	0.0	0.0
8 kHz	0.8	1.2	1.2	8.0	3.5	0.0	0.0
16 kHz	0.0	3.9	7.5	12.5	8.0	0.0	0.0
Chinchilla N71D							
0.125 kHz	0.0	0.5	6.7	5.6	4.3	0.0	0.0
0.25 kHz	0.4	0.0	0.0	0.0	0.0	0.0	0.0
0.5 kHz	0.8	0.0	0.3	0.0	0.1	0.0	0.0
1 kHz	0.8	0.3	0.3	0.0	0.2	0.0	0.0
2 kHz	0.4	0.0	0.0	0.0	0.0	0.0	0.0
4 kHz	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 kHz	0.0	0.6	0.3	0.3	0.4	0.0	0.0
16 kHz	0.0	2.5	2.1	2.5	2.4	0.0	0.0

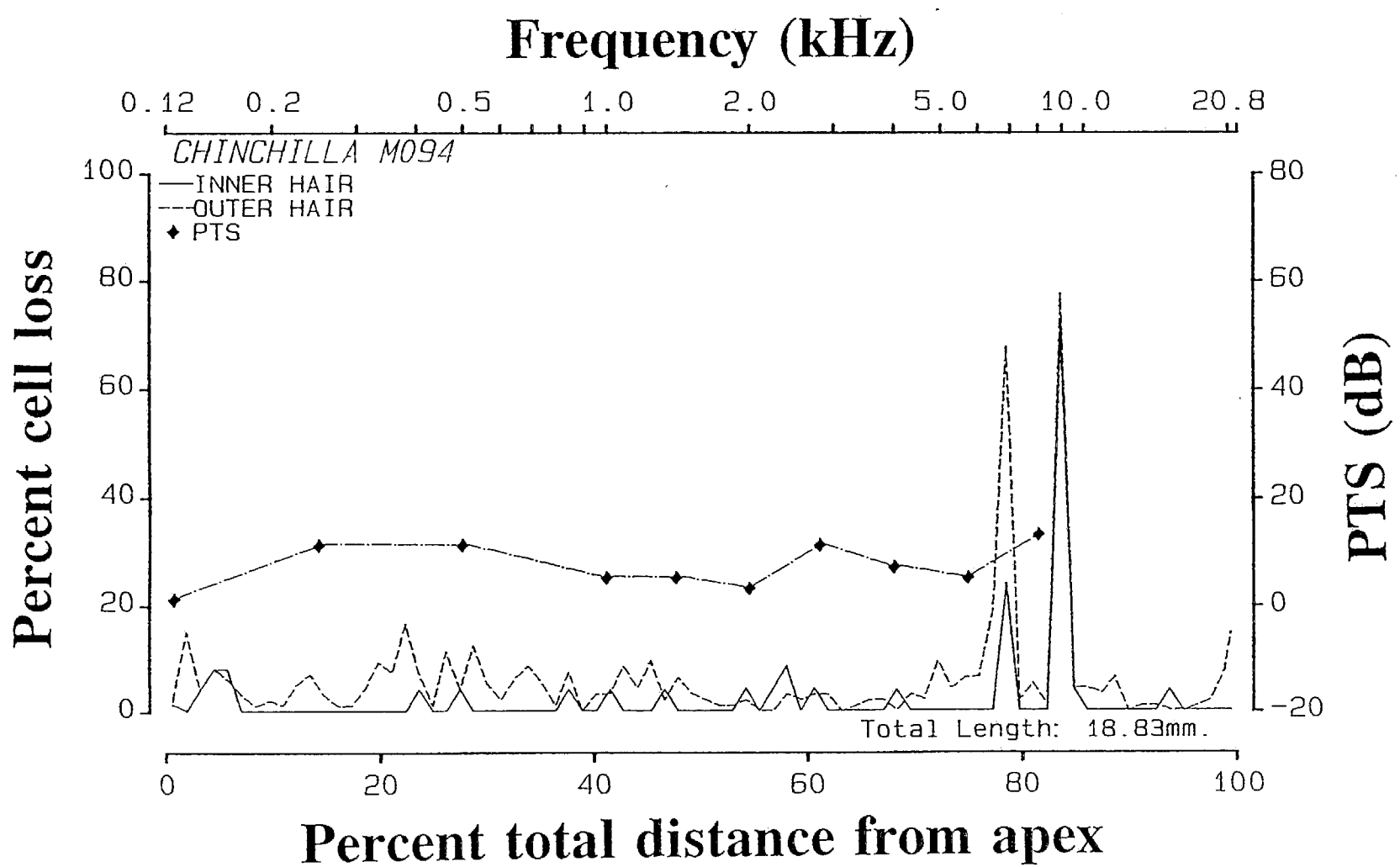
2450 Hz center frequency, 134 dB peak SPL

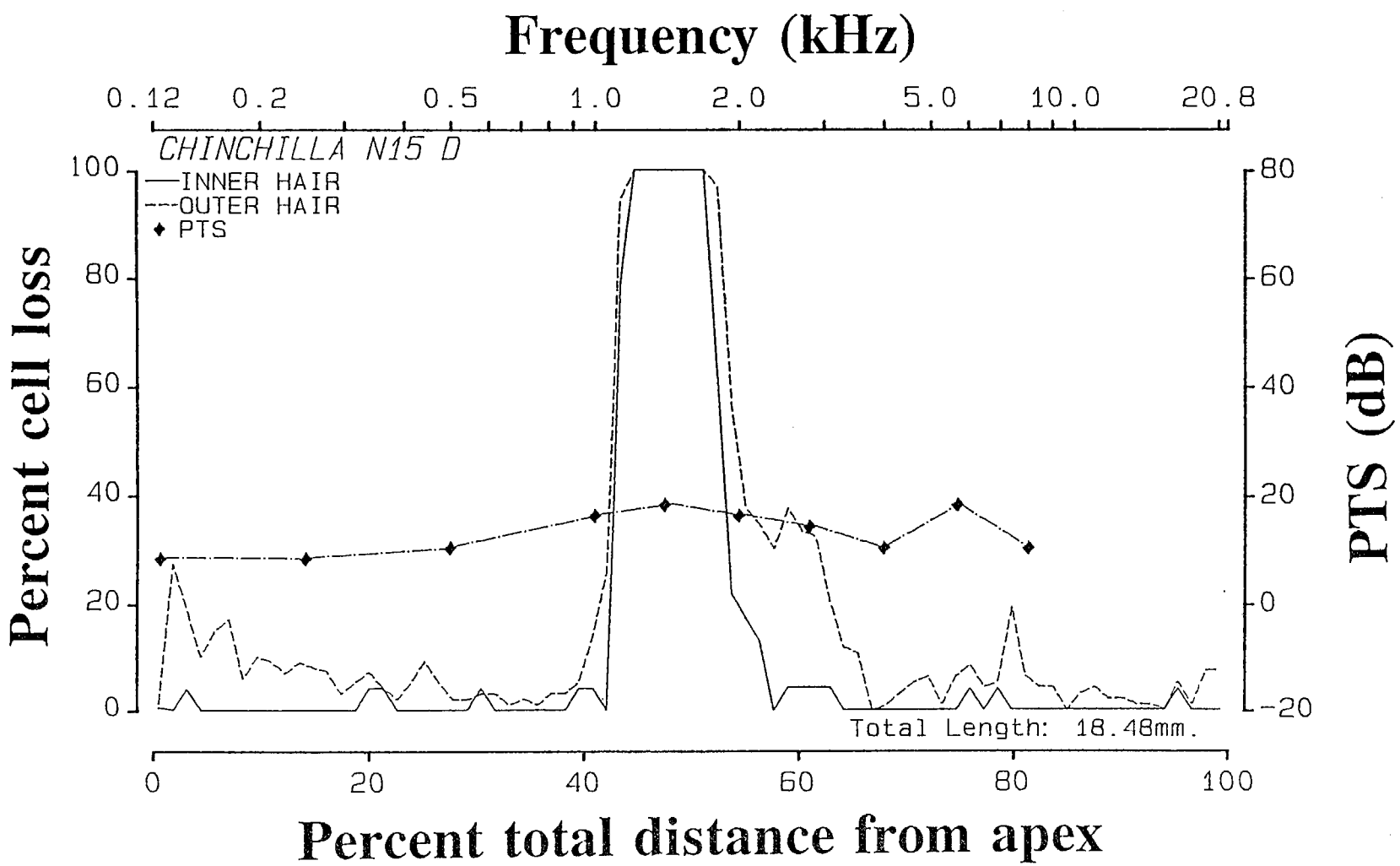
Percent sensory cell losses over octave band frequencies

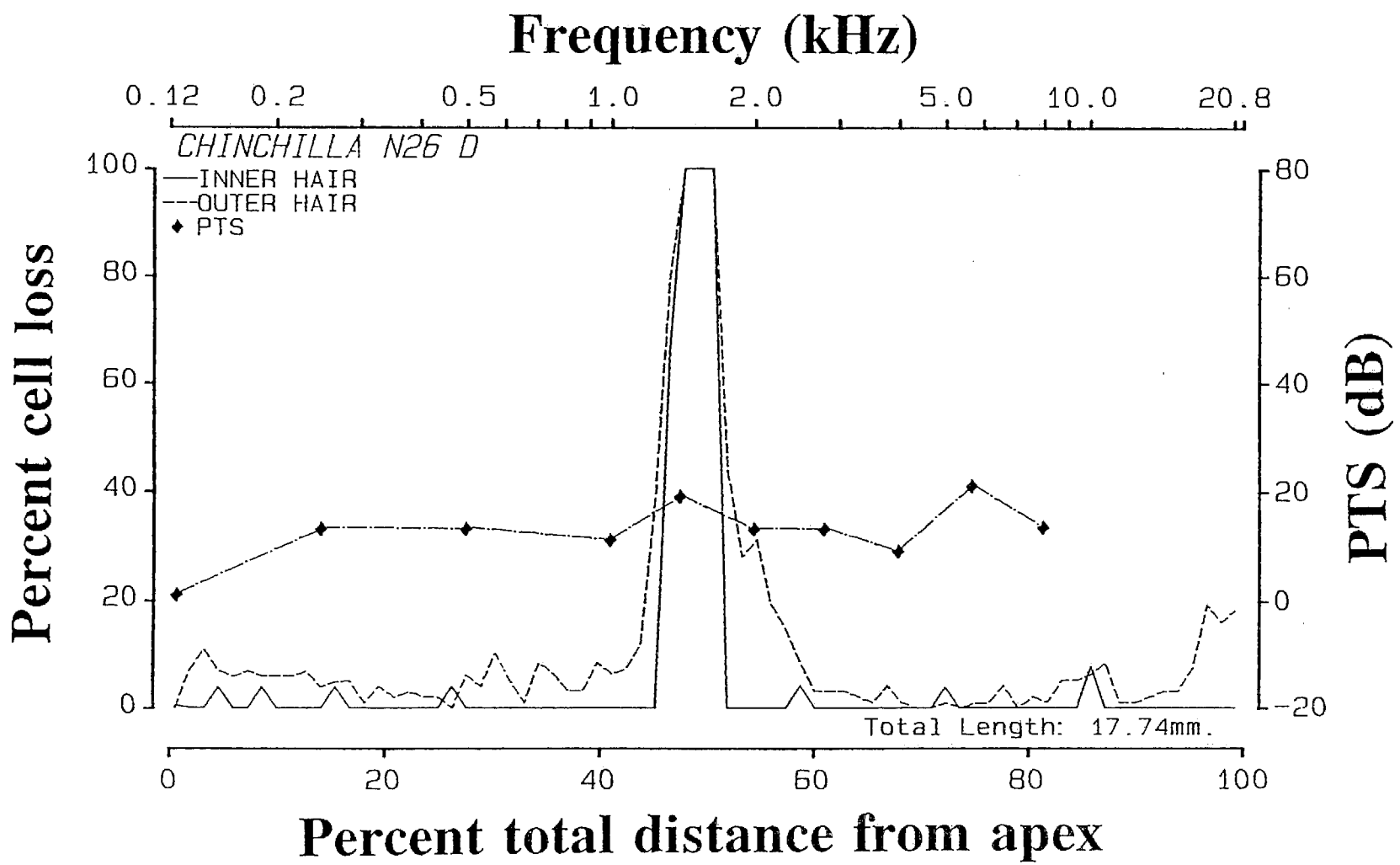
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	1.47	2.73	6.30	17.68	8.91	0.22	1.18
0.25 kHz	0.27	3.03	1.55	7.42	4.00	0.02	0.10
0.5 kHz	0.52	2.82	4.63	5.45	4.30	0.00	0.00
1 kHz	15.80	22.72	24.23	21.53	22.83	15.20	14.55
2 kHz	13.37	26.15	28.83	17.77	24.25	11.75	12.00
4 kHz	0.48	4.38	5.58	1.65	3.87	0.12	0.20
8 kHz	2.87	6.68	7.63	7.35	7.22	1.32	1.52
16 kHz	0.42	3.05	5.02	4.88	4.32	0.00	0.15
Group standard deviations							
0.125 kHz	2.02	1.39	4.13	11.87	5.08	0.53	2.01
0.25 kHz	0.33	2.14	1.40	6.59	2.47	0.04	0.15
0.5 kHz	0.31	2.30	4.75	3.17	2.55	0.00	0.00
1 kHz	18.11	22.95	22.80	19.61	21.71	17.38	16.81
2 kHz	19.78	28.66	32.35	20.75	26.89	18.10	18.29
4 kHz	0.38	3.97	7.66	1.94	3.83	0.29	0.49
8 kHz	3.91	7.41	7.47	6.11	6.69	3.03	3.43
16 kHz	0.52	1.00	3.74	4.67	2.90	0.00	0.25

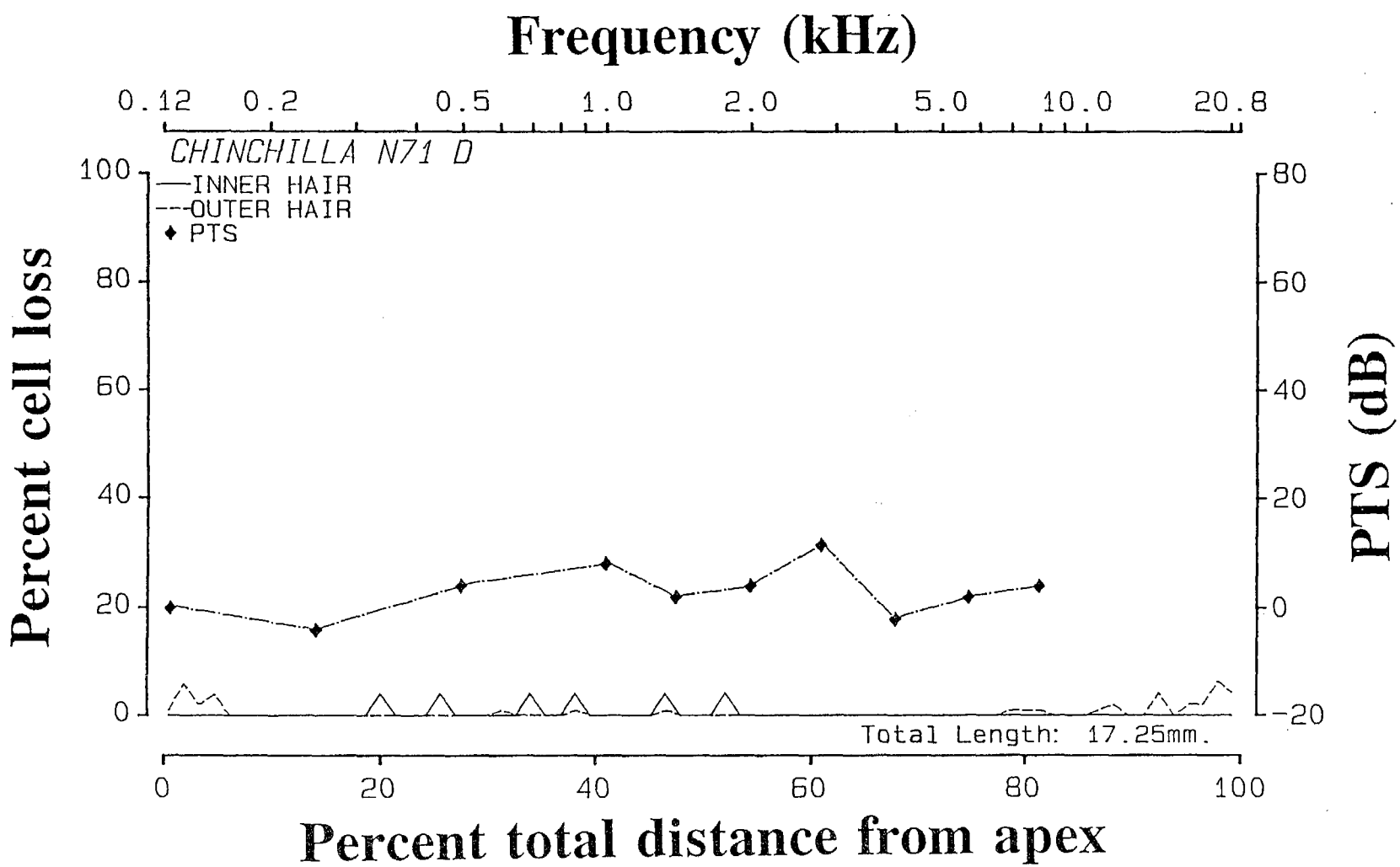

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M090
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.54mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M093
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.36mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M094
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.83mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N15 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.48mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N26 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.74mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA N71 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.25mm.
0
20
40
60
80
100
Percent total distance from apex

Temporary Threshold Shift (dB): 2450 Hz center frequency, 139 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	40.0	48.0	65.0	65.0	52.0	49.0	27.0	25.0	23.0	21.0	20.0	18.0	6.0	4.0	12.0	65.0
M020	38.0	26.0	44.0	42.0	30.0	37.0	5.0	13.0	11.0	19.0	18.0	6.0	14.0	12.0	10.0	44.0
M050	38.0	36.0	44.0	32.0	40.0	28.0	26.0	24.0	22.0	20.0	8.0	6.0	14.0	2.0	0.0	44.0
M055	5.0	4.0	14.0	34.0	41.0	22.0	2.0	12.0	-1.0	8.0	12.0	9.0	5.0	4.0	3.0	41.0
M063	32.0	40.0	48.0	56.0	69.0	69.0	50.0	69.0	56.0	44.0	42.0	40.0	28.0	26.0	24.0	69.0
S25	16.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	16.0
S45	8.0	26.0	25.0	43.0	61.0	49.0	37.0	34.0	32.0	30.0	28.0	26.0	34.0	32.0	40.0	61.0
Mean	25.3	26.3	34.6	38.9	41.6	35.7	21.6	25.6	20.4	20.0	17.7	15.6	14.7	11.4	12.4	48.6
S.D.	15.2	17.1	21.8	20.8	23.4	23.4	18.5	21.8	19.9	14.8	14.7	13.4	12.1	12.7	15.0	18.3

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	74.0	82.0	80.0	84.0	66.0	63.0	41.0	39.0	27.0	25.0	24.0	22.0	10.0	8.0	16.0	84.0
M020	44.0	72.0	50.0	58.0	36.0	43.0	41.0	29.0	37.0	25.0	14.0	2.0	10.0	8.0	6.0	72.0
M050	52.0	60.0	58.0	46.0	54.0	32.0	30.0	28.0	16.0	24.0	12.0	0.0	8.0	6.0	4.0	60.0
M055	27.0	26.0	36.0	36.0	53.0	44.0	34.0	14.0	21.0	30.0	14.0	21.0	7.0	6.0	15.0	53.0
M063	56.0	54.0	62.0	80.0	93.0	86.0	74.0	93.0	80.0	68.0	66.0	64.0	52.0	40.0	48.0	93.0
S25	20.0	18.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	20.0
S45	36.0	44.0	43.0	71.0	79.0	67.0	55.0	52.0	50.0	48.0	46.0	44.0	42.0	40.0	38.0	79.0
Mean	44.1	50.9	47.9	54.1	54.7	47.9	39.0	37.3	33.6	31.7	25.1	21.6	19.3	16.0	18.4	65.9
S.D.	18.4	23.3	23.3	28.2	29.8	27.8	23.4	28.9	25.2	20.9	23.0	24.9	19.2	16.5	17.8	24.4

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	92.0	97.0	88.0	97.0	74.0	61.0	29.0	47.0	25.0	33.0	22.0	20.0	18.0	16.0	14.0	97.0
M020	58.0	76.0	74.0	62.0	40.0	27.0	15.0	33.0	41.0	19.0	8.0	6.0	14.0	12.0	10.0	76.0
M050	42.0	50.0	58.0	46.0	53.0	42.0	30.0	28.0	26.0	24.0	12.0	0.0	8.0	6.0	4.0	58.0
M055	41.0	22.0	40.0	60.0	45.0	58.0	18.0	28.0	15.0	14.0	18.0	15.0	11.0	0.0	19.0	60.0
M063	44.0	52.0	60.0	78.0	91.0	91.0	72.0	91.0	58.0	66.0	64.0	52.0	50.0	48.0	36.0	91.0
S25	20.0	18.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	20.0
S45	50.0	48.0	57.0	65.0	73.0	71.0	59.0	56.0	54.0	52.0	50.0	48.0	46.0	44.0	42.0	73.0
Mean	49.6	51.9	54.7	58.9	54.0	50.0	31.6	39.9	31.9	30.0	24.9	19.9	20.4	17.1	18.1	67.9
S.D.	22.0	27.9	26.2	29.0	29.2	30.0	25.8	29.4	20.0	22.3	23.4	22.0	20.1	21.0	15.4	25.6

Temporary Threshold Shift (dB): 2450 Hz center frequency, 139 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	99.0	82.0	94.0	88.0	76.0	63.0	61.0	39.0	17.0	25.0	14.0	12.0	10.0	18.0	16.0	99.0
M020	74.0	72.0	70.0	88.0	66.0	63.0	51.0	39.0	37.0	35.0	34.0	32.0	30.0	28.0	26.0	88.0
M050	60.0	58.0	66.0	64.0	62.0	50.0	28.0	36.0	24.0	22.0	20.0	8.0	6.0	4.0	2.0	66.0
M055	44.0	23.0	33.0	53.0	40.0	41.0	41.0	31.0	18.0	17.0	21.0	8.0	34.0	3.0	2.0	53.0
M063	52.0	60.0	68.0	86.0	84.0	82.0	70.0	99.0	66.0	74.0	62.0	70.0	48.0	56.0	54.0	99.0
S25	26.0	24.0	12.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	-3.0	26.0
S45	70.0	68.0	57.0	75.0	83.0	61.0	59.0	56.0	54.0	62.0	50.0	48.0	46.0	54.0	52.0	83.0
Mean	60.7	55.3	57.1	64.9	58.4	50.9	44.9	43.1	30.9	33.3	29.6	26.0	25.1	23.3	21.3	73.4
S.D.	23.4	23.1	26.9	31.5	30.6	27.3	22.7	29.5	23.0	26.4	20.2	25.1	19.1	23.8	23.8	26.9

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	62.0	80.0	97.0	76.0	84.0	71.0	49.0	47.0	25.0	13.0	12.0	20.0	8.0	16.0	14.0	97.0
M020	84.0	82.0	80.0	68.0	66.0	73.0	51.0	59.0	57.0	55.0	54.0	42.0	40.0	38.0	36.0	84.0
M050	54.0	52.0	70.0	58.0	56.0	34.0	42.0	30.0	28.0	26.0	14.0	2.0	10.0	-2.0	6.0	70.0
M055	59.0	28.0	18.0	58.0	45.0	36.0	36.0	26.0	13.0	12.0	6.0	3.0	-1.0	18.0	-3.0	59.0
M063	58.0	46.0	64.0	82.0	80.0	78.0	66.0	95.0	62.0	70.0	58.0	56.0	64.0	52.0	50.0	95.0
S25	14.0	22.0	10.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	-6.0	2.0	0.0	-2.0	6.0	22.0
S45	56.0	54.0	73.0	61.0	89.0	57.0	55.0	52.0	50.0	48.0	46.0	44.0	42.0	40.0	48.0	89.0
Mean	55.3	52.0	58.9	58.7	60.9	50.4	43.0	44.1	33.3	31.4	26.3	24.1	23.3	22.9	22.4	73.7
S.D.	20.8	23.1	32.4	24.2	28.9	27.0	20.4	29.9	23.9	26.8	25.7	23.0	25.3	21.1	21.8	26.6

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	82.0	97.0	88.0	92.0	84.0	61.0	49.0	47.0	25.0	23.0	12.0	10.0	18.0	26.0	14.0	97.0
M020	82.0	80.0	78.0	76.0	64.0	71.0	59.0	57.0	45.0	53.0	32.0	40.0	48.0	46.0	44.0	82.0
M050	48.0	56.0	74.0	62.0	70.0	48.0	26.0	34.0	32.0	30.0	18.0	6.0	4.0	2.0	0.0	74.0
M055	33.0	32.0	42.0	62.0	59.0	40.0	40.0	30.0	27.0	16.0	20.0	17.0	3.0	2.0	21.0	62.0
M063	52.0	60.0	58.0	86.0	99.0	92.0	70.0	99.0	76.0	74.0	72.0	60.0	58.0	56.0	44.0	99.0
S25	26.0	14.0	12.0	0.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	26.0
S45	44.0	52.0	61.0	69.0	77.0	65.0	53.0	50.0	38.0	56.0	44.0	42.0	40.0	48.0	46.0	77.0
Mean	52.4	55.9	59.0	63.9	65.9	54.7	43.0	45.6	34.7	37.1	29.1	25.6	24.7	25.7	23.9	73.9
S.D.	22.0	27.8	25.6	30.4	28.8	27.2	22.1	29.7	23.0	24.2	22.7	21.7	23.6	24.5	21.0	24.8

Temporary Threshold Shift (dB): 2450 Hz center frequency, 139 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	95.0	95.0	76.0	90.0	82.0	69.0	37.0	35.0	13.0	11.0	10.0	8.0	6.0	4.0	2.0	95.0
M020	72.0	80.0	78.0	76.0	54.0	71.0	49.0	37.0	35.0	43.0	32.0	30.0	28.0	36.0	34.0	80.0
M050	56.0	64.0	72.0	60.0	69.0	36.0	34.0	32.0	30.0	18.0	16.0	4.0	2.0	0.0	-2.0	72.0
M055	38.0	30.0	50.0	50.0	57.0	38.0	28.0	28.0	25.0	24.0	19.0	15.0	21.0	0.0	19.0	57.0
M063	50.0	48.0	56.0	97.0	97.0	97.0	88.0	97.0	84.0	72.0	80.0	68.0	56.0	54.0	52.0	97.0
S25	14.0	22.0	10.0	8.0	6.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	22.0
S45	64.0	82.0	61.0	49.0	77.0	65.0	53.0	60.0	58.0	56.0	54.0	52.0	50.0	48.0	56.0	82.0
Mean	55.6	60.1	57.6	61.4	63.1	54.3	41.6	41.3	34.7	31.4	30.7	25.6	23.3	20.0	22.4	72.1
S.D.	25.7	27.7	23.5	30.1	29.2	30.5	26.4	30.2	28.6	26.7	27.3	25.7	22.8	25.0	25.4	26.0

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	95.0	95.0	76.0	95.0	62.0	59.0	37.0	35.0	13.0	11.0	10.0	18.0	6.0	4.0	2.0	95.0
M020	72.0	70.0	78.0	66.0	74.0	71.0	59.0	37.0	35.0	33.0	32.0	30.0	38.0	36.0	34.0	78.0
M050	66.0	64.0	62.0	60.0	58.0	36.0	34.0	32.0	20.0	28.0	16.0	4.0	2.0	0.0	-2.0	66.0
M055	13.0	42.0	32.0	82.0	39.0	40.0	30.0	30.0	27.0	6.0	10.0	7.0	9.0	2.0	11.0	82.0
M063	32.0	50.0	68.0	99.0	99.0	99.0	90.0	99.0	99.0	74.0	72.0	60.0	58.0	46.0	44.0	99.0
S25	16.0	14.0	12.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	-4.0	4.0	2.0	0.0	-2.0	16.0
S45	22.0	30.0	49.0	77.0	75.0	53.0	51.0	38.0	46.0	44.0	32.0	30.0	28.0	26.0	34.0	77.0
Mean	45.1	52.1	53.9	68.4	57.9	50.6	43.6	39.0	34.3	27.7	24.0	21.9	20.4	16.3	17.3	73.3
S.D.	32.2	26.9	24.5	33.3	32.2	32.0	26.9	29.2	32.2	26.0	24.7	20.3	21.6	19.4	19.5	27.6

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	93.0	93.0	74.0	72.0	70.0	67.0	25.0	23.0	1.0	9.0	-2.0	-4.0	4.0	2.0	0.0	93.0
M020	68.0	76.0	93.0	93.0	60.0	87.0	55.0	53.0	41.0	29.0	28.0	26.0	24.0	22.0	20.0	93.0
M050	66.0	64.0	62.0	60.0	58.0	36.0	34.0	32.0	30.0	28.0	16.0	4.0	2.0	0.0	8.0	66.0
M055	49.0	38.0	38.0	48.0	55.0	36.0	26.0	16.0	33.0	22.0	6.0	12.0	19.0	18.0	17.0	55.0
M063	28.0	46.0	54.0	95.0	95.0	95.0	95.0	95.0	95.0	70.0	78.0	66.0	54.0	52.0	40.0	95.0
S25	12.0	20.0	8.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	0.0	-2.0	6.0	-6.0	20.0
S45	16.0	24.0	43.0	61.0	79.0	47.0	45.0	42.0	30.0	48.0	36.0	34.0	32.0	40.0	38.0	79.0
Mean	47.4	51.6	53.1	62.1	60.1	52.9	40.0	38.4	33.7	30.0	23.4	19.7	19.0	20.0	16.7	71.6
S.D.	30.2	27.2	27.3	30.2	28.4	32.5	29.8	29.3	30.8	22.8	27.8	24.6	19.9	19.8	17.7	27.4

Temporary Threshold Shift (dB): 2450 Hz center frequency, 139 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
M004	95.0	95.0	66.0	95.0	62.0	59.0	57.0	35.0	13.0	31.0	10.0	8.0	6.0	4.0	2.0	95.0
M020	95.0	68.0	86.0	95.0	90.0	89.0	57.0	35.0	33.0	31.0	40.0	38.0	26.0	34.0	32.0	95.0
M050	60.0	58.0	66.0	64.0	52.0	40.0	18.0	26.0	24.0	22.0	10.0	-2.0	6.0	4.0	2.0	66.0
M055	19.0	38.0	48.0	58.0	25.0	36.0	36.0	26.0	23.0	12.0	16.0	23.0	19.0	-2.0	7.0	58.0
M063	26.0	54.0	62.0	93.0	93.0	93.0	84.0	93.0	93.0	68.0	76.0	54.0	62.0	60.0	48.0	93.0
S25	20.0	18.0	6.0	4.0	2.0	0.0	-2.0	6.0	4.0	2.0	0.0	8.0	6.0	4.0	2.0	20.0
S45	20.0	28.0	37.0	45.0	73.0	41.0	39.0	36.0	34.0	42.0	30.0	28.0	26.0	34.0	22.0	73.0
Mean	47.9	51.3	53.0	64.9	56.7	51.1	41.3	36.7	32.0	29.7	26.0	22.4	21.6	19.7	16.4	71.4
S.D.	35.3	26.0	25.8	33.5	33.5	32.5	28.2	26.9	28.9	21.5	25.8	19.5	20.0	23.3	18.2	27.2

2450 Hz center frequency, 139 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
M004	124	411	425	409	1245
M020	136	1010	1028	960	2998
M050	82	716	822	545	2083
M055	69	271	397	436	1104
M063	357	1189	1305	1177	3671
S25	29	47	68	86	201
S45	162	706	829	589	2124
Group mean	137				1918
S.D.	107				1181
S.E.	40				446

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	0.9	62.9
	0.25 kHz	1.1	61.6
	0.5 kHz	1.1	55.0
	1 kHz	54.3	527.6
	2 kHz	50.0	582.4
	4 kHz	12.3	383.1
	8 kHz	13.4	185.6
	16 kHz	3.9	59.9
Standard deviations			
	0.125 kHz	1.6	29.5
	0.25 kHz	1.1	48.9
	0.5 kHz	1.9	49.0
	1 kHz	61.1	319.2
	2 kHz	34.4	383.6
	4 kHz	13.9	334.8
	8 kHz	24.5	247.2
	16 kHz	6.6	125.1

2450 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M004							
0.125 kHz	0	26	37	45	108	0	0
0.25 kHz	2	9	9	10	28	1	0
0.5 kHz	0	1	2	2	5	0	0
1 kHz	88	232	241	206	679	160	108
2 kHz	29	113	113	114	340	62	47
4 kHz	3	19	16	20	55	0	0
8 kHz	2	3	5	8	16	0	0
16 kHz	0	8	2	4	14	0	0
TOTALS	124	411	425	409	1245	223	155
Chinchilla M020							
0.125 kHz	0	3	5	22	30	0	2
0.25 kHz	1	3	2	5	10	0	1
0.5 kHz	1	5	32	12	49	0	0
1 kHz	16	304	299	221	824	5	60
2 kHz	112	330	330	330	990	241	187
4 kHz	4	312	305	302	919	5	77
8 kHz	1	42	51	65	158	0	15
16 kHz	1	11	4	3	18	0	0
TOTALS	136	1010	1028	960	2998	251	342
Chinchilla M050							
0.125 kHz	0	23	32	34	89	0	0
0.25 kHz	0	11	23	64	98	0	0
0.5 kHz	0	11	12	21	44	0	0
1 kHz	23	168	266	109	543	48	35
2 kHz	51	317	320	273	910	111	67
4 kHz	4	177	154	34	365	0	1
8 kHz	2	8	14	10	32	0	0
16 kHz	2	1	1	0	2	0	0
TOTALS	82	716	822	545	2083	159	103

2450 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M055							
0.125 kHz	2	12	17	45	74	0	0
0.25 kHz	1	4	23	120	147	0	0
0.5 kHz	0	6	1	39	46	0	0
1 kHz	1	33	82	47	162	0	21
2 kHz	36	63	112	57	232	80	47
4 kHz	20	80	100	66	246	42	25
8 kHz	3	67	59	59	185	0	0
16 kHz	6	6	3	3	12	0	0
TOTALS	69	271	397	436	1104	122	93
Chinchilla M063							
0.125 kHz	0	8	9	47	64	0	0
0.25 kHz	3	14	13	48	75	0	0
0.5 kHz	5	31	77	31	139	0	0
1 kHz	163	265	285	245	795	339	214
2 kHz	61	264	279	258	801	109	71
4 kHz	40	217	261	248	726	0	1
8 kHz	67	234	276	218	728	15	5
16 kHz	18	156	105	82	343	1	1
TOTALS	357	1189	1305	1177	3671	464	292
Chinchilla S25D							
0.125 kHz	4	1	17	23	41	0	0
0.25 kHz	1	6	5	10	21	0	0
0.5 kHz	2	0	2	1	3	0	0
1 kHz	0	1	4	2	7	0	0
2 kHz	1	1	1	3	5	0	0
4 kHz	2	3	1	4	8	0	0
8 kHz	19	34	37	41	112	46	26
16 kHz	0	1	1	2	4	0	2
TOTALS	29	47	68	86	201	46	28

2450 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S45D							
0.125 kHz	0	4	9	21	34	0	0
0.25 kHz	0	24	10	18	52	0	0
0.5 kHz	0	27	36	36	99	0	0
1 kHz	89	203	279	201	683	186	124
2 kHz	60	271	294	234	799	109	72
4 kHz	13	156	161	46	363	0	0
8 kHz	0	11	35	22	68	0	0
16 kHz	0	10	5	11	26	0	0
TOTALS	162	706	829	589	2124	295	196
Group means							
0.125 kHz	0.9	11.0	18.0	33.9	62.9	0.0	0.3
0.25 kHz	1.1	10.1	12.1	39.3	61.6	0.1	0.1
0.5 kHz	1.1	11.6	23.1	20.3	55.0	0.0	0.0
1 kHz	54.3	172.3	208.0	147.3	527.6	105.4	80.3
2 kHz	50.0	194.1	207.0	181.3	582.4	101.7	70.1
4 kHz	12.3	137.7	142.6	102.9	383.1	6.7	14.9
8 kHz	13.4	57.0	68.1	60.4	185.6	8.7	6.6
16 kHz	3.9	27.6	17.3	15.0	59.9	0.1	0.4
TOTALS	137.0	621.4	696.3	600.3	1918.0	222.9	172.7
Group standard deviations							
0.125 kHz	1.6	9.9	12.2	11.9	29.5	0.0	0.8
0.25 kHz	1.1	7.2	8.2	41.9	48.9	0.4	0.4
0.5 kHz	1.9	12.5	27.8	15.7	49.0	0.0	0.0
1 kHz	61.1	114.9	116.3	94.8	319.2	128.9	74.1
2 kHz	34.4	132.6	129.7	123.1	383.6	73.0	57.2
4 kHz	13.9	111.1	114.6	120.2	334.8	15.7	28.9
8 kHz	24.5	81.3	93.6	73.0	247.2	17.4	10.2
16 kHz	6.6	56.8	38.7	29.7	125.1	0.4	0.8
TOTALS	106.9	405.4	422.7	363.6	1181.3	135.2	112.5

2450 Hz center frequency, 139 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M004							
0.125 kHz	0.0	15.0	21.3	26.0	20.8	0.0	0.0
0.25 kHz	0.8	2.9	2.9	3.3	3.0	0.2	0.0
0.5 kHz	0.0	0.3	0.6	0.6	0.5	0.0	0.0
1 kHz	39.6	80.2	83.3	71.2	78.2	34.3	37.3
2 kHz	13.3	38.3	38.3	38.6	38.4	13.0	15.9
4 kHz	1.2	6.4	5.4	6.8	6.2	0.0	0.0
8 kHz	0.8	1.0	1.6	2.7	1.8	0.0	0.0
16 kHz	0.0	2.8	0.7	1.4	1.6	0.0	0.0
Chinchilla M020							
0.125 kHz	0.0	1.5	2.5	11.3	5.1	0.0	1.0
0.25 kHz	0.3	0.8	0.5	1.4	0.9	0.0	0.2
0.5 kHz	0.3	1.4	9.4	3.5	4.8	0.0	0.0
1 kHz	6.4	94.4	92.8	68.6	85.3	0.9	18.6
2 kHz	45.5	100.0	100.0	100.0	100.0	45.3	56.6
4 kHz	1.5	94.8	92.7	91.7	93.1	0.9	23.4
8 kHz	0.3	12.7	15.4	19.6	15.9	0.0	4.5
16 kHz	0.4	3.6	1.3	0.9	1.9	0.0	0.0
Chinchilla M050							
0.125 kHz	0.0	11.8	16.4	17.5	15.2	0.0	0.0
0.25 kHz	0.0	3.2	6.7	18.7	9.5	0.0	0.0
0.5 kHz	0.0	3.2	3.5	6.1	4.3	0.0	0.0
1 kHz	9.1	51.8	82.0	33.6	55.8	9.1	10.8
2 kHz	20.7	95.7	96.6	82.4	91.6	20.7	20.2
4 kHz	1.5	53.6	46.6	10.3	36.8	0.0	0.3
8 kHz	0.7	2.4	4.2	3.0	3.2	0.0	0.0
16 kHz	0.8	0.3	0.3	0.0	0.2	0.0	0.0

2450 Hz center frequency, 139 dB peak SPL

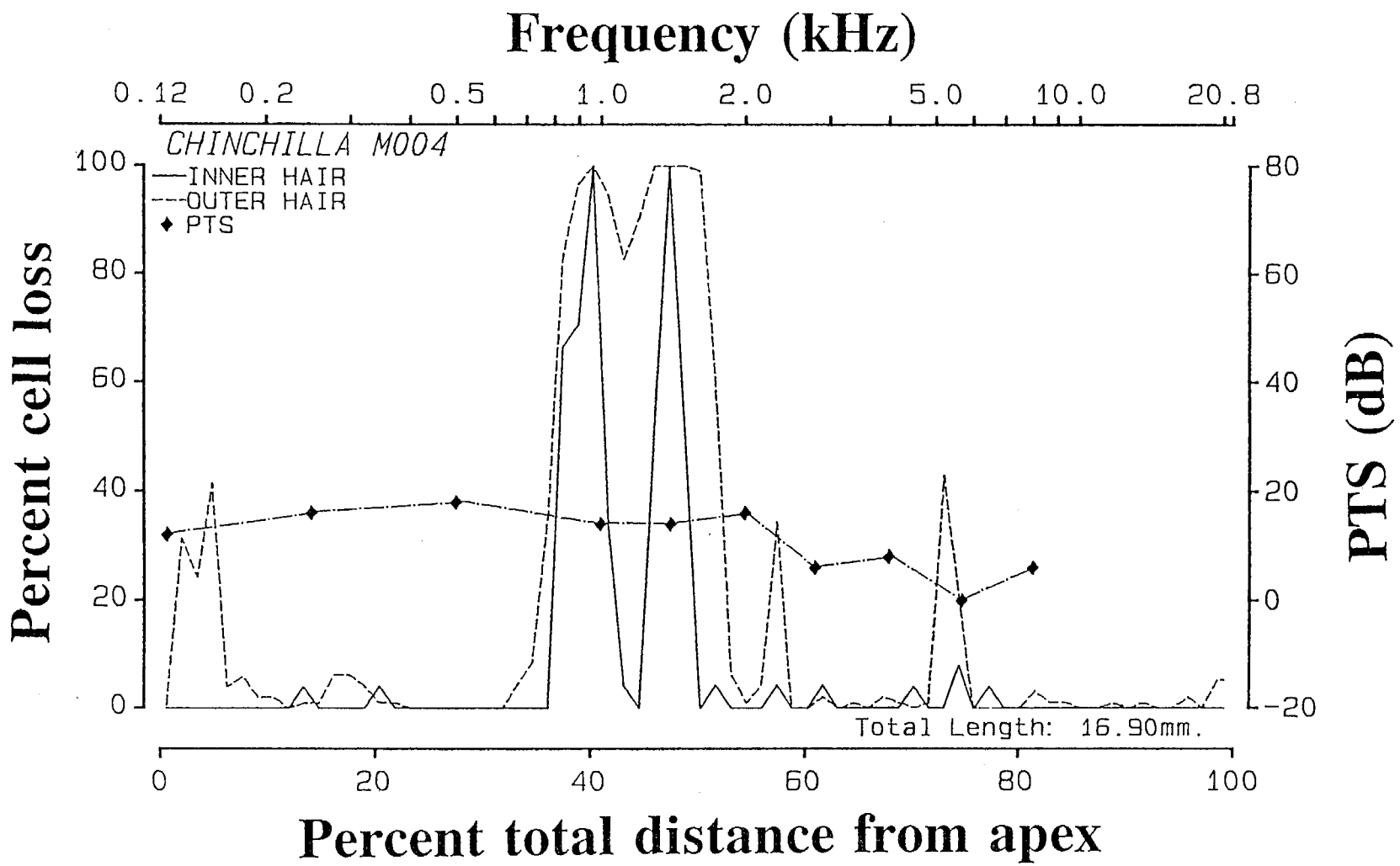
Percent sensory cell losses over octave band frequencies

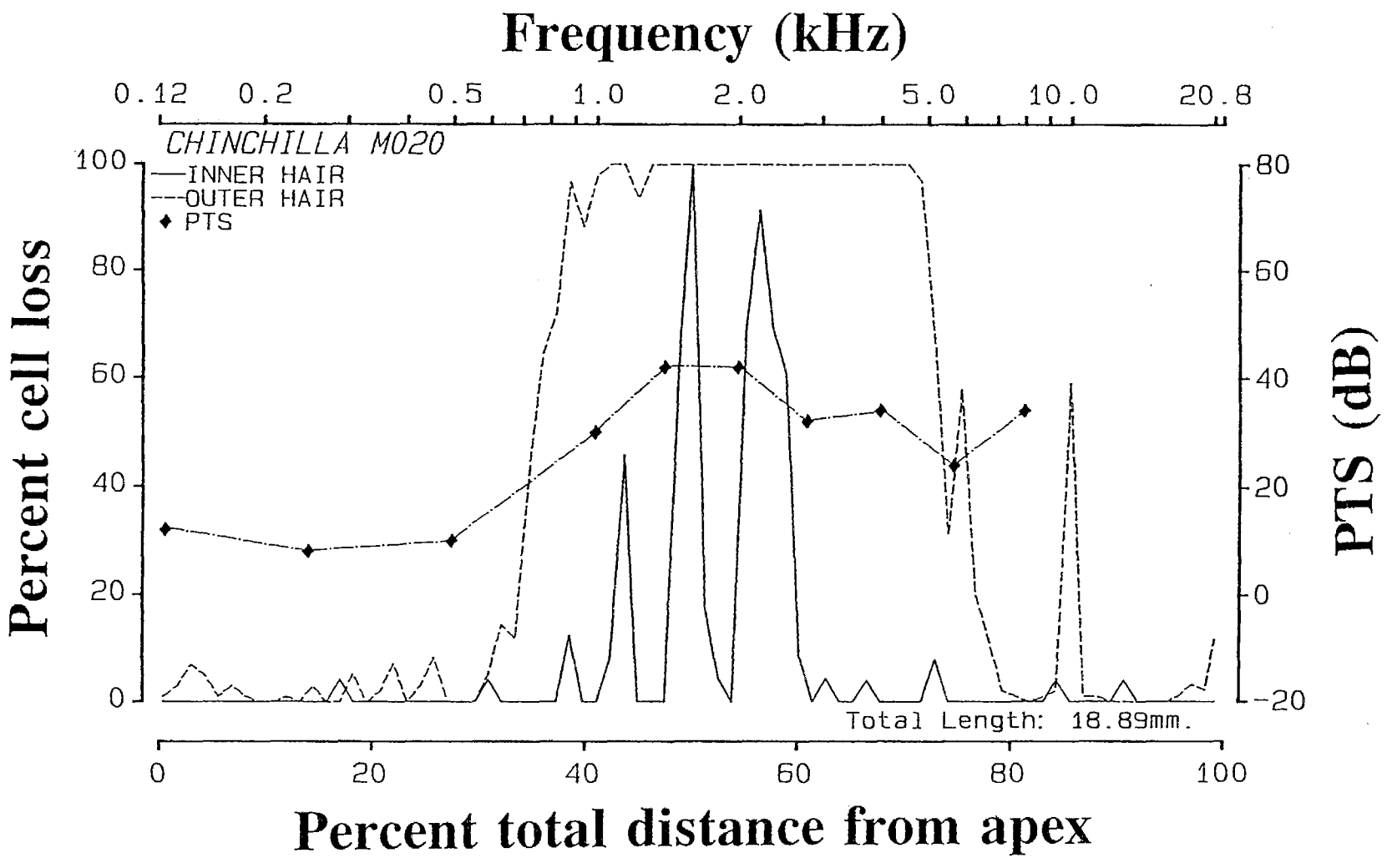
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla M055							
0.125 kHz	1.3	6.1	8.6	22.9	12.5	0.0	0.0
0.25 kHz	0.3	1.1	6.6	34.7	14.1	0.0	0.0
0.5 kHz	0.0	1.7	0.2	11.4	4.4	0.0	0.0
1 kHz	0.3	10.0	25.0	14.3	16.4	0.0	6.4
2 kHz	14.5	18.8	33.5	17.0	23.1	14.8	14.0
4 kHz	7.5	23.9	29.9	19.7	24.5	7.7	7.4
8 kHz	1.1	20.0	17.6	17.6	18.4	0.0	0.0
16 kHz	2.4	1.9	0.9	0.9	1.2	0.0	0.0
Chinchilla M063							
0.125 kHz	0.0	4.5	5.1	27.0	12.2	0.0	0.0
0.25 kHz	1.3	4.6	4.2	15.8	8.2	0.0	0.0
0.5 kHz	2.1	10.2	25.4	10.2	15.3	0.0	0.0
1 kHz	73.0	91.3	98.2	84.4	91.3	72.5	73.7
2 kHz	27.8	89.4	94.5	87.4	90.4	22.8	24.0
4 kHz	16.7	73.3	88.1	83.7	81.7	0.0	0.3
8 kHz	28.1	79.0	93.2	73.6	81.9	3.1	1.6
16 kHz	8.0	56.5	38.0	29.7	41.4	0.2	0.3
Chinchilla S25D							
0.125 kHz	2.9	0.5	9.6	12.9	7.7	0.0	0.0
0.25 kHz	0.4	1.9	1.6	3.2	2.2	0.0	0.0
0.5 kHz	0.8	0.0	0.6	0.3	0.3	0.0	0.0
1 kHz	0.0	0.3	1.3	0.6	0.7	0.0	0.0
2 kHz	0.4	0.3	0.3	0.9	0.5	0.0	0.0
4 kHz	0.8	0.9	0.3	1.3	0.8	0.0	0.0
8 kHz	7.8	11.2	12.2	13.6	12.3	9.4	8.6
16 kHz	0.0	0.3	0.3	0.7	0.4	0.0	0.7

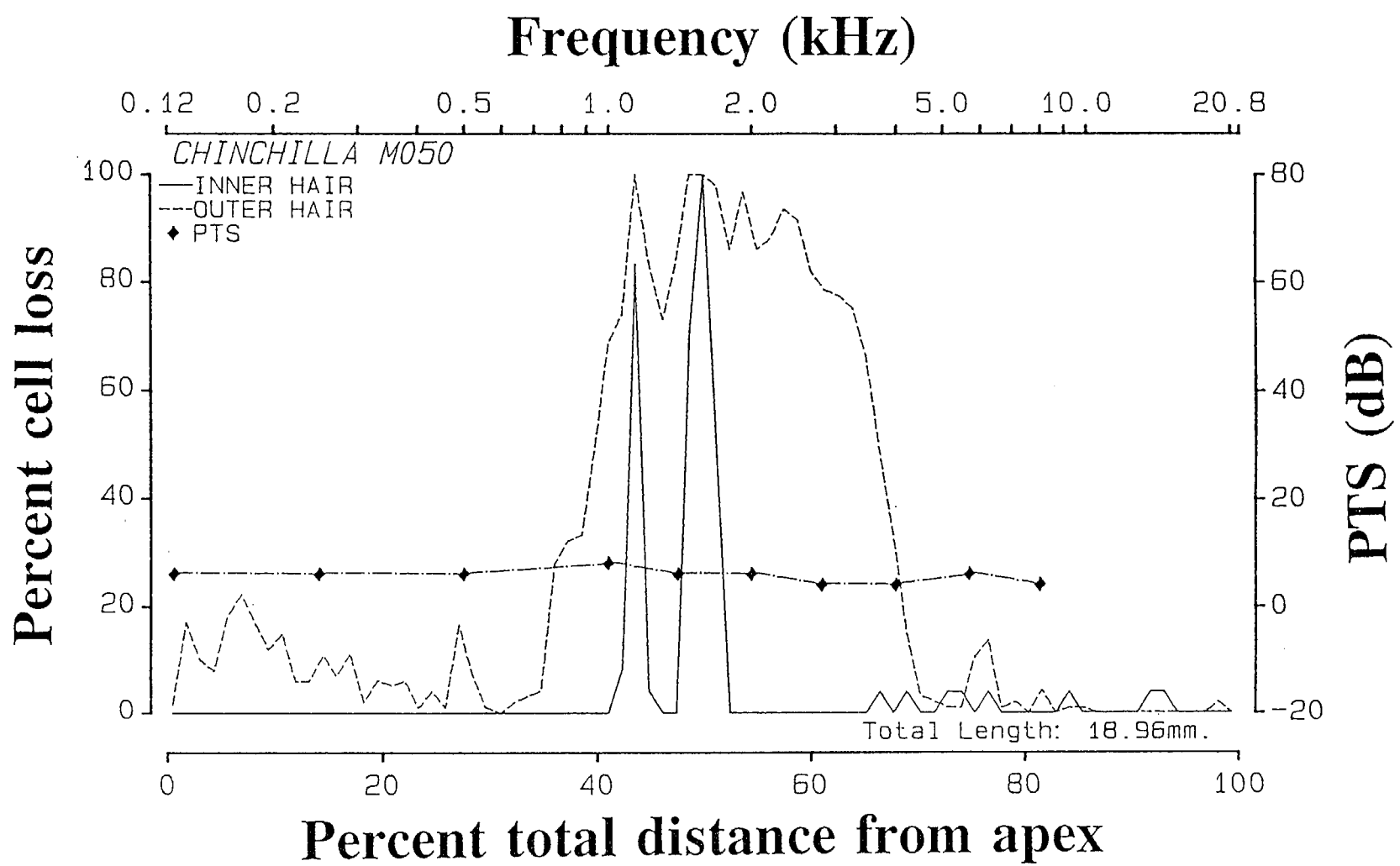
2450 Hz center frequency, 139 dB peak SPL

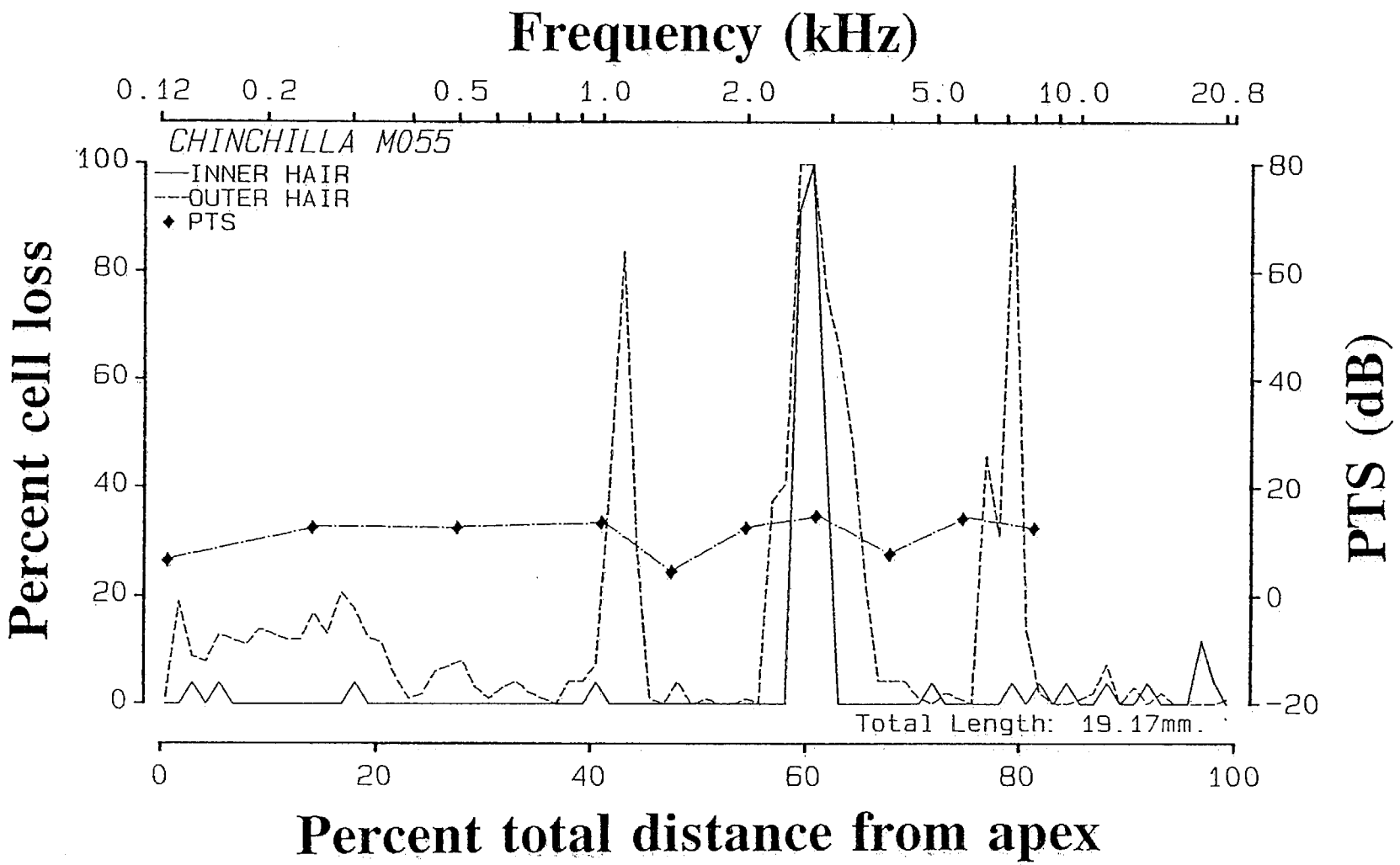
Percent sensory cell losses over octave band frequencies

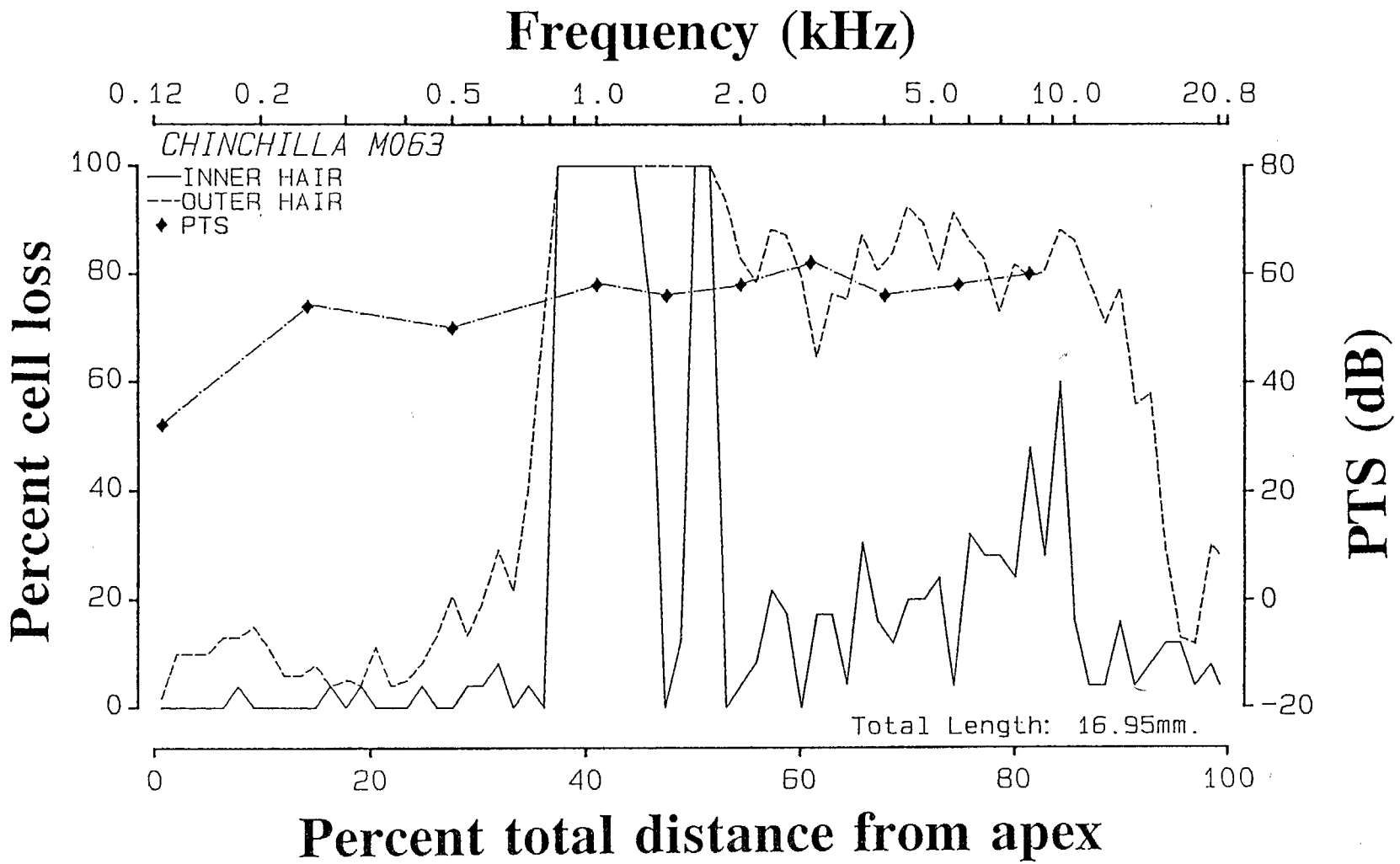
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S45D							
0.125 kHz	0.0	2.2	4.9	11.6	6.2	0.0	0.0
0.25 kHz	0.0	7.5	3.1	5.6	5.4	0.0	0.0
0.5 kHz	0.0	8.5	11.3	11.3	10.4	0.0	0.0
1 kHz	38.1	67.4	92.6	66.7	75.6	38.2	41.1
2 kHz	26.2	87.9	95.4	75.9	86.4	21.9	23.3
4 kHz	5.3	50.8	52.4	14.9	39.4	0.0	0.0
8 kHz	0.0	3.5	11.3	7.1	7.3	0.0	0.0
16 kHz	0.0	3.4	1.7	3.7	2.9	0.0	0.0
Group means							
0.125 kHz	0.60	5.94	9.77	18.46	11.39	0.00	0.14
0.25 kHz	0.44	3.14	3.66	11.81	6.20	0.03	0.03
0.5 kHz	0.46	3.61	7.29	6.20	5.70	0.00	0.00
1 kHz	23.79	56.49	67.89	48.49	57.62	22.14	26.84
2 kHz	21.20	61.49	65.51	57.46	61.49	19.79	22.00
4 kHz	4.93	43.39	45.06	32.63	40.36	1.23	4.49
8 kHz	5.54	18.54	22.21	19.60	20.12	1.79	2.10
16 kHz	1.66	9.83	6.17	5.33	7.11	0.03	0.14
Group standard deviations							
0.125 kHz	1.12	5.50	6.79	6.83	5.55	0.00	0.38
0.25 kHz	0.46	2.32	2.36	12.12	4.70	0.08	0.08
0.5 kHz	0.78	4.08	9.15	4.87	5.39	0.00	0.00
1 kHz	27.42	38.01	38.43	32.21	35.55	27.52	25.73
2 kHz	14.14	41.30	40.64	38.43	39.94	13.71	17.28
4 kHz	5.77	34.76	36.48	38.14	35.31	2.87	8.77
8 kHz	10.31	27.51	31.82	24.74	27.96	3.55	3.31
16 kHz	2.93	20.62	14.04	10.81	15.15	0.08	0.27

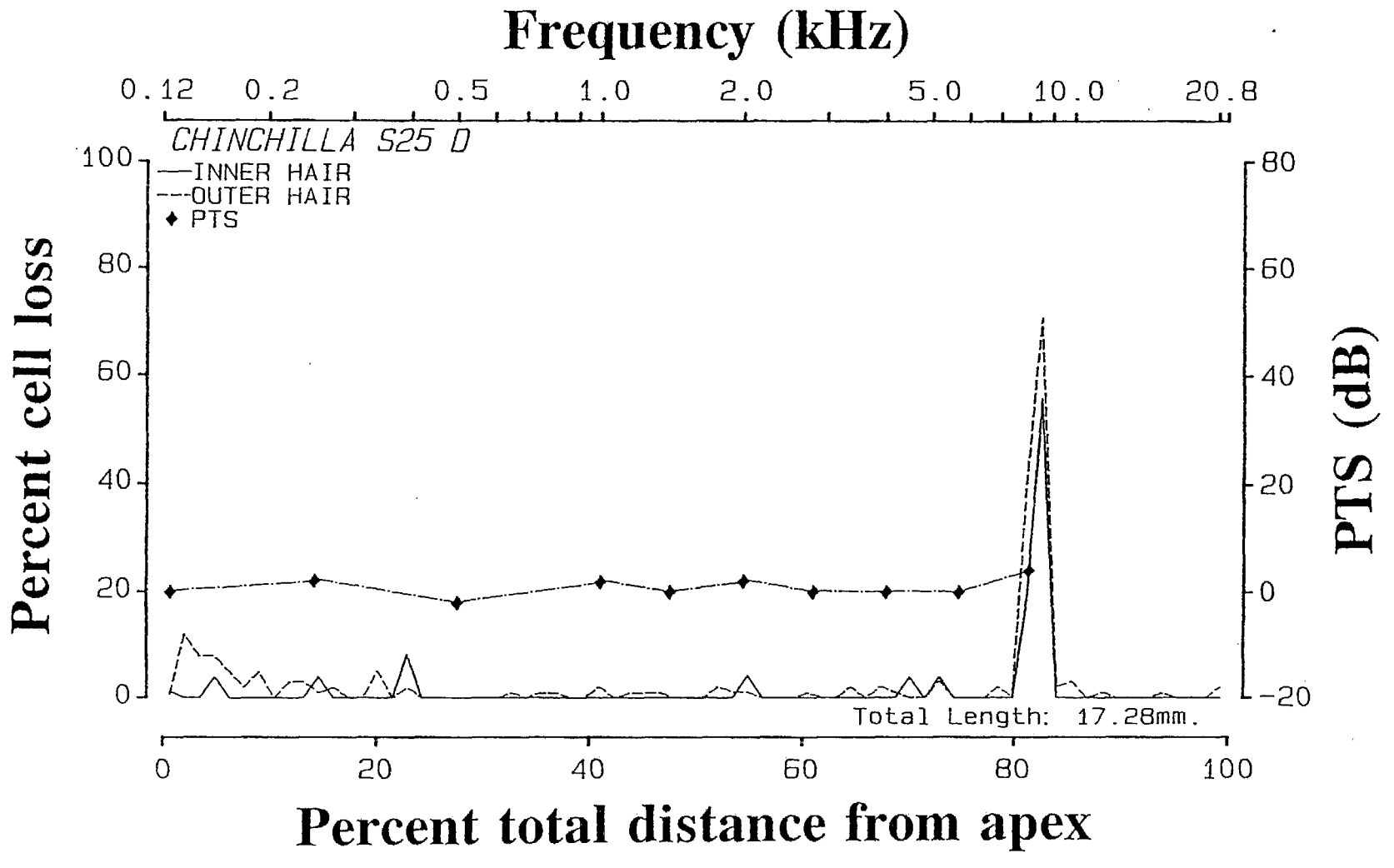

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M004
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.90mm.
0
20
40
60
80
100
Percent total distance from apex

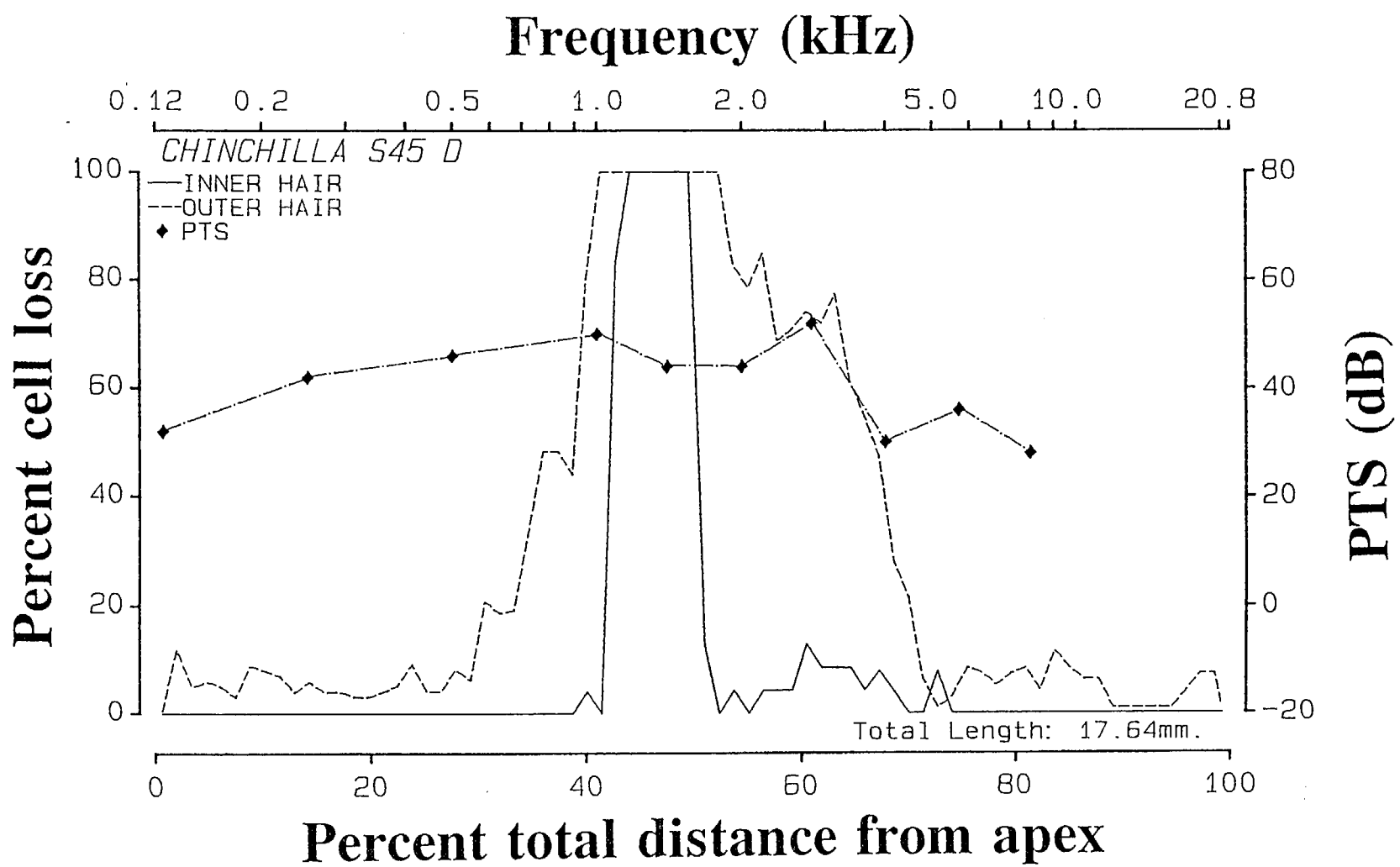

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M020
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.89mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M050
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.96mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M055
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.17mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA M063
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.95mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S25 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.28mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S45 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.64mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

2450 Hz center frequency, 144 dB peak SPL

Animal #		
T015	-	Completed the entire protocol
T019	-	Completed the entire protocol
T020	-	Completed the entire protocol
T037	-	Completed the entire protocol
T046	-	Completed the entire protocol

2450 Hz center frequency, 144 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T015	24.0	3.0	5.0	1.0	4.0	0.0	0.0	0.0	1.0	0.0
T019	26.0	11.0	-1.0	1.0	0.0	-2.0	0.0	0.0	3.0	6.0
T020	23.0	10.0	4.0	2.0	1.0	1.0	1.0	3.0	0.0	5.0
T037	22.0	9.0	-1.0	-3.0	0.0	-2.0	-2.0	0.0	3.0	8.0
T046	19.0	10.0	0.0	-2.0	3.0	1.0	3.0	-3.0	2.0	3.0
Mean	22.8	8.6	1.4	-0.2	1.6	-0.4	0.4	0.0	1.8	4.4
S.D.	2.6	3.2	2.9	2.2	1.8	1.5	1.8	2.1	1.3	3.0

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T015	26.6	7.6	9.6	7.6	6.6	4.6	2.4	2.6	3.8	4.6
T019	55.0	42.0	50.0	46.0	47.0	49.0	39.0	37.0	40.0	41.0
T020	40.8	33.8	29.8	31.8	30.8	24.8	22.8	22.8	7.8	6.8
T037	62.0	61.0	57.0	51.0	48.0	60.0	62.0	50.0	53.2	44.0
T046	42.0	21.0	31.0	35.0	30.0	32.0	36.0	20.0	13.0	14.0
Mean	45.3	33.1	35.5	34.3	32.5	34.1	32.4	26.5	23.6	22.1
S.D.	13.7	20.3	18.7	16.9	16.8	21.5	21.9	18.0	21.8	19.0

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T015	2.6	4.6	4.6	6.6	2.6	4.6	2.4	2.6	2.8	4.6
T019	29.0	31.0	51.0	45.0	47.0	51.0	39.0	37.0	37.0	35.0
T020	17.8	23.8	25.8	29.8	29.8	23.8	21.8	19.8	7.8	1.8
T037	40.0	52.0	58.0	54.0	48.0	62.0	64.0	50.0	50.2	36.0
T046	23.0	11.0	31.0	37.0	27.0	31.0	33.0	23.0	11.0	11.0
Mean	22.5	24.5	34.1	34.5	30.9	34.5	32.0	26.5	21.8	17.7
S.D.	13.9	18.6	21.3	18.0	18.5	22.6	22.7	18.0	20.7	16.6

Temporary Threshold Shift (dB): 2450 Hz center frequency, 144 dB peak SPL

Frequency 0.125 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	41.0	49.0	47.0	44.0	32.0	30.0	8.0	6.0	5.0	3.0	1.0	9.0	-3.0	4.0	2.0	49.0
T019	55.0	54.0	46.0	57.0	59.0	28.0	35.0	42.0	33.0	40.0	39.0	28.0	27.0	26.0	25.0	59.0
T020	51.0	50.0	49.0	48.0	17.0	36.0	25.0	24.0	23.0	22.0	21.0	11.0	30.0	9.0	18.0	51.0
T037	45.0	51.0	64.0	63.0	62.0	51.0	50.0	49.0	48.0	47.0	46.0	45.0	34.0	33.0	42.0	64.0
T046	45.0	54.0	53.0	52.0	41.0	30.0	39.0	38.0	27.0	16.0	15.0	34.0	13.0	22.0	31.0	54.0
Mean	47.4	51.6	51.8	52.8	42.2	35.0	31.4	31.8	27.2	25.6	24.4	25.4	20.2	18.8	23.6	55.4
S.D.	5.6	2.3	7.3	7.5	18.8	9.4	15.9	17.1	15.6	17.9	18.2	15.3	15.2	12.0	14.9	6.1

Frequency 0.250 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	53.0	61.0	59.0	56.0	54.0	42.0	10.0	8.0	17.0	5.0	3.0	1.0	9.0	6.0	4.0	61.0
T019	51.0	60.0	52.0	63.0	55.0	44.0	31.0	48.0	29.0	46.0	45.0	34.0	13.0	32.0	31.0	63.0
T020	55.0	54.0	63.0	52.0	31.0	40.0	29.0	28.0	27.0	36.0	35.0	25.0	24.0	13.0	22.0	63.0
T037	49.0	75.0	68.0	77.0	86.0	65.0	64.0	63.0	62.0	61.0	50.0	49.0	48.0	57.0	56.0	86.0
T046	45.0	54.0	53.0	52.0	41.0	40.0	29.0	38.0	27.0	26.0	15.0	4.0	13.0	12.0	11.0	54.0
Mean	50.6	60.8	59.0	60.0	53.4	46.2	32.6	37.0	32.4	34.8	29.6	22.6	21.4	24.0	24.8	65.4
S.D.	3.8	8.6	6.8	10.5	20.7	10.6	19.5	20.7	17.2	21.1	20.0	20.3	15.9	20.9	20.3	12.1

Frequency 0.500 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	45.0	63.0	51.0	47.0	56.0	34.0	2.0	10.0	9.0	7.0	5.0	3.0	1.0	8.0	6.0	63.0
T019	77.0	86.0	88.0	79.0	71.0	60.0	47.0	64.0	45.0	62.0	51.0	50.0	49.0	58.0	47.0	88.0
T020	55.0	54.0	63.0	62.0	31.0	40.0	39.0	48.0	37.0	46.0	15.0	45.0	34.0	3.0	32.0	63.0
T037	73.0	79.0	82.0	81.0	80.0	69.0	78.0	67.0	76.0	65.0	64.0	53.0	42.0	61.0	70.0	82.0
T046	69.0	78.0	67.0	56.0	45.0	44.0	33.0	42.0	31.0	30.0	19.0	38.0	37.0	36.0	25.0	78.0
Mean	63.8	72.0	70.2	65.0	56.6	49.4	39.8	46.2	39.6	42.0	30.8	37.8	32.6	33.2	36.0	74.8
S.D.	13.4	13.1	14.9	14.7	19.6	14.6	27.3	22.8	24.4	24.0	25.3	20.3	18.6	27.1	24.0	11.3

Temporary Threshold Shift (dB): 2450 Hz center frequency, 144 dB peak SPL

Frequency 1.000 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	61.0	59.0	67.0	64.0	72.0	50.0	8.0	16.0	15.0	3.0	11.0	-1.0	7.0	4.0	12.0	72.0
T019	67.0	76.0	78.0	79.0	71.0	50.0	47.0	44.0	45.0	42.0	41.0	40.0	49.0	48.0	47.0	79.0
T020	59.0	58.0	67.0	56.0	45.0	44.0	23.0	22.0	21.0	20.0	29.0	39.0	28.0	17.0	36.0	67.0
T037	77.0	73.0	76.0	85.0	74.0	63.0	62.0	71.0	70.0	59.0	58.0	57.0	56.0	55.0	44.0	85.0
T046	63.0	72.0	71.0	60.0	49.0	48.0	37.0	36.0	35.0	34.0	33.0	42.0	41.0	30.0	39.0	72.0
Mean	65.4	67.6	71.8	68.8	62.2	51.0	35.4	37.8	37.2	31.6	34.4	35.4	36.2	30.8	35.6	75.0
S.D.	7.1	8.4	5.1	12.6	14.0	7.1	20.9	21.6	21.8	21.3	17.2	21.6	19.4	21.2	13.9	7.0

Frequency 1.400 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	57.0	55.0	53.0	70.0	68.0	56.0	4.0	2.0	11.0	9.0	7.0	5.0	3.0	0.0	-2.0	70.0
T019	87.0	76.0	88.0	79.0	71.0	40.0	47.0	54.0	45.0	52.0	51.0	50.0	49.0	48.0	37.0	88.0
T020	59.0	58.0	67.0	56.0	35.0	44.0	33.0	32.0	31.0	40.0	39.0	29.0	28.0	17.0	36.0	67.0
T037	73.0	69.0	72.0	81.0	80.0	59.0	68.0	57.0	66.0	55.0	44.0	43.0	52.0	51.0	50.0	81.0
T046	67.0	76.0	75.0	64.0	43.0	42.0	31.0	30.0	29.0	19.0	37.0	26.0	35.0	24.0	13.0	76.0
Mean	68.6	66.8	71.0	70.0	59.4	48.2	36.6	35.0	36.4	35.0	35.6	30.6	33.4	28.0	26.8	76.4
S.D.	12.1	9.9	12.7	10.4	19.4	8.7	23.5	22.2	20.5	20.3	16.9	17.4	19.6	21.5	20.9	8.4

Frequency 2.000 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	71.0	59.0	57.0	64.0	52.0	50.0	8.0	6.0	15.0	3.0	1.0	9.0	7.0	4.0	2.0	71.0
T019	79.0	88.0	90.0	91.0	73.0	52.0	49.0	56.0	47.0	64.0	53.0	52.0	51.0	50.0	49.0	91.0
T020	59.0	59.0	67.0	56.0	35.0	54.0	33.0	32.0	41.0	40.0	29.0	19.0	18.0	17.0	36.0	67.0
T037	65.0	71.0	74.0	73.0	72.0	71.0	70.0	69.0	68.0	67.0	76.0	55.0	64.0	63.0	52.0	76.0
T046	69.0	88.0	67.0	36.0	45.0	44.0	43.0	32.0	21.0	50.0	19.0	48.0	27.0	36.0	25.0	88.0
Mean	68.6	73.0	71.0	64.0	55.4	54.2	40.6	39.0	38.4	44.8	35.6	36.6	33.4	34.0	32.8	78.6
S.D.	7.4	14.5	12.2	20.4	16.7	10.1	22.7	24.4	21.3	25.8	29.4	21.1	23.6	23.9	20.3	10.5

Temporary Threshold Shift (dB): 2450 Hz center frequency, 144 dB peak SPL

Frequency 2.800 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	61.0	59.0	67.0	64.0	62.0	50.0	-2.0	16.0	15.0	3.0	1.0	-1.0	6.0	4.0	2.0	67.0
T019	57.0	66.0	68.0	79.0	71.0	40.0	47.0	44.0	45.0	52.0	31.0	40.0	39.0	38.0	47.0	79.0
T020	79.0	78.0	57.0	76.0	35.0	44.0	13.0	32.0	21.0	20.0	19.0	29.0	18.0	17.0	26.0	79.0
T037	65.0	91.0	84.0	83.0	82.0	71.0	70.0	69.0	68.0	67.0	66.0	75.0	54.0	63.0	62.0	91.0
T046	77.0	46.0	75.0	64.0	43.0	22.0	41.0	10.0	19.0	28.0	37.0	36.0	35.0	24.0	33.0	77.0
Mean	67.8	68.0	70.2	73.2	58.6	45.4	33.8	34.2	33.6	34.0	30.8	35.8	30.4	29.2	34.0	78.6
S.D.	9.8	17.3	10.0	8.8	19.5	17.7	28.5	23.6	22.5	25.5	24.0	27.2	18.7	22.5	22.6	8.5

Frequency 4.000 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	41.0	59.0	67.0	54.0	72.0	50.0	8.0	6.0	15.0	3.0	1.0	-1.0	7.0	4.0	2.0	72.0
T019	57.0	66.0	58.0	79.0	51.0	40.0	37.0	44.0	45.0	52.0	41.0	40.0	19.0	48.0	37.0	79.0
T020	57.0	56.0	65.0	54.0	13.0	22.0	1.0	10.0	9.0	8.0	17.0	17.0	16.0	15.0	34.0	65.0
T037	83.0	79.0	72.0	81.0	80.0	69.0	58.0	57.0	56.0	55.0	74.0	53.0	32.0	51.0	40.0	83.0
T046	96.0	62.0	71.0	60.0	29.0	48.0	27.0	26.0	15.0	24.0	33.0	32.0	11.0	20.0	19.0	96.0
Mean	66.8	64.4	66.6	65.6	49.0	45.8	26.2	28.6	28.0	28.4	33.2	28.2	17.0	27.6	26.4	79.0
S.D.	22.2	9.0	5.6	13.4	28.2	17.0	22.9	21.8	21.0	24.2	27.5	20.9	9.6	20.8	15.9	11.7

Frequency 5.700 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	59.0	67.0	65.0	62.0	60.0	58.0	6.0	4.0	13.0	11.0	-1.0	7.0	6.0	2.0	0.0	67.0
T019	73.0	62.0	44.0	65.0	57.0	36.0	43.0	50.0	41.0	48.0	37.0	36.0	45.0	44.0	23.0	73.0
T020	59.0	58.0	57.0	46.0	15.0	34.0	23.0	42.0	31.0	10.0	-1.0	9.0	8.0	7.0	16.0	59.0
T037	89.0	85.0	78.0	87.0	76.0	55.0	54.0	53.0	52.0	61.0	50.0	69.0	49.0	37.0	46.0	89.0
T046	77.0	56.0	55.0	44.0	13.0	22.0	11.0	0.0	9.0	-2.0	7.0	26.0	15.0	4.0	3.0	77.0
Mean	71.4	65.6	59.8	60.8	44.2	41.0	27.4	29.8	29.2	25.6	18.4	29.4	24.6	18.8	17.6	73.0
S.D.	12.8	11.6	12.6	17.4	28.5	15.2	20.6	25.7	18.3	27.3	23.6	25.2	20.8	20.0	18.5	11.2

Temporary Threshold Shift (dB): 2450 Hz center frequency, 144 dB peak SPL

Frequency 8.000 kHz

Animal\Day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T015	55.0	53.0	61.0	68.0	66.0	44.0	2.0	10.0	9.0	7.0	5.0	3.0	1.0	8.0	6.0	68.0
T019	65.0	54.0	56.0	57.0	59.0	38.0	35.0	42.0	43.0	50.0	49.0	38.0	17.0	26.0	45.0	65.0
T020	19.0	58.0	47.0	36.0	5.0	14.0	-7.0	2.0	1.0	10.0	-1.0	-1.0	-2.0	7.0	6.0	58.0
T037	69.0	65.0	68.0	67.0	66.0	55.0	64.0	43.0	52.0	41.0	50.0	39.0	28.0	37.0	26.0	69.0
T046	51.0	40.0	49.0	48.0	17.0	16.0	5.0	4.0	13.0	2.0	31.0	10.0	9.0	8.0	-3.0	51.0
Mean	51.8	54.0	56.2	55.2	42.6	33.4	19.8	20.2	23.6	22.0	26.8	17.8	10.6	17.2	16.0	62.2
S.D.	19.7	9.1	8.6	13.5	29.3	17.9	29.3	20.6	22.5	21.9	24.0	19.3	12.2	13.6	19.4	7.6

2450 Hz center frequency, 144 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
T015	40	367	362	321	1050
T019	117	1146	1112	1000	3258
T020	19	557	564	506	1627
T037	239	1243	1253	1092	3588
T046	56	619	546	509	1674
Group mean	94				2239
S.D.	89				1114
S.E.	40				498

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.6	44.8
	0.25 kHz	3.0	29.4
	0.5 kHz	3.0	151.6
	1 kHz	45.4	720.2
	2 kHz	22.4	668.4
	4 kHz	14.4	438.4
	8 kHz	3.0	173.2
	16 kHz	1.4	13.4
Standard deviations			
	0.125 kHz	2.5	14.1
	0.25 kHz	5.1	21.6
	0.5 kHz	5.6	172.9
	1 kHz	59.0	200.5
	2 kHz	24.9	262.4
	4 kHz	14.6	370.5
	8 kHz	4.0	241.5
	16 kHz	1.5	5.7

2450 Hz center frequency, 144 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T015							
0.125 kHz	0	1	11	23	35	0	5
0.25 kHz	0	11	11	16	38	0	0
0.5 kHz	0	2	2	14	18	0	0
1 kHz	5	149	146	98	393	0	2
2 kHz	6	93	92	67	252	0	1
4 kHz	25	107	98	100	305	42	43
8 kHz	1	1	2	2	5	0	0
16 kHz	3	3	0	1	4	0	0
TOTALS	40	367	362	321	1050	42	51
Chinchilla T019							
0.125 kHz	0	11	8	8	27	0	9
0.25 kHz	0	2	4	4	10	0	0
0.5 kHz	1	81	81	68	230	1	1
1 kHz	48	287	279	204	770	87	52
2 kHz	64	309	303	287	899	125	94
4 kHz	1	264	272	237	773	1	0
8 kHz	2	187	155	189	531	1	0
16 kHz	1	5	10	3	18	0	0
TOTALS	117	1146	1112	1000	3258	215	156
Chinchilla T020							
0.125 kHz	1	8	11	26	45	0	0
0.25 kHz	1	12	5	5	22	0	0
0.5 kHz	0	3	5	9	17	0	0
1 kHz	4	265	266	248	779	2	1
2 kHz	1	241	245	189	675	0	10
4 kHz	10	21	26	21	68	13	6
8 kHz	2	4	2	1	7	1	0
16 kHz	0	3	4	7	14	0	0
TOTALS	19	557	564	506	1627	16	17

2450 Hz center frequency, 144 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T037							
0.125 kHz	1	9	15	37	61	0	0
0.25 kHz	12	5	14	44	63	0	0
0.5 kHz	13	150	165	104	419	18	57
1 kHz	146	313	313	313	939	282	183
2 kHz	23	317	296	273	886	0	3
4 kHz	34	316	315	258	889	5	18
8 kHz	10	129	129	60	318	0	0
16 kHz	0	4	6	3	13	0	0
TOTALS	239	1243	1253	1092	3588	305	261
Chinchilla T046							
0.125 kHz	6	4	14	38	56	0	0
0.25 kHz	2	4	1	9	14	0	0
0.5 kHz	1	6	22	46	74	0	1
1 kHz	24	266	231	223	720	48	50
2 kHz	18	271	221	138	630	57	53
4 kHz	2	59	56	42	157	3	4
8 kHz	0	2	0	3	5	0	0
16 kHz	3	7	1	10	18	1	0
TOTALS	56	619	546	509	1674	109	108
Group means							
0.125 kHz	1.6	6.6	11.8	26.4	44.8	0.0	2.8
0.25 kHz	3.0	6.8	7.0	15.6	29.4	0.0	0.0
0.5 kHz	3.0	48.4	55.0	48.2	151.6	3.8	11.8
1 kHz	45.4	256.0	247.0	217.2	720.2	83.8	57.6
2 kHz	22.4	246.2	231.4	190.8	668.4	36.4	32.2
4 kHz	14.4	153.4	153.4	131.6	438.4	12.8	14.2
8 kHz	3.0	64.6	57.6	51.0	173.2	0.4	0.0
16 kHz	1.4	4.4	4.2	4.8	13.4	0.2	0.0
TOTALS	94.2	786.4	767.4	685.6	2239.4	137.4	118.6

2450 Hz center frequency, 144 dB peak SPL

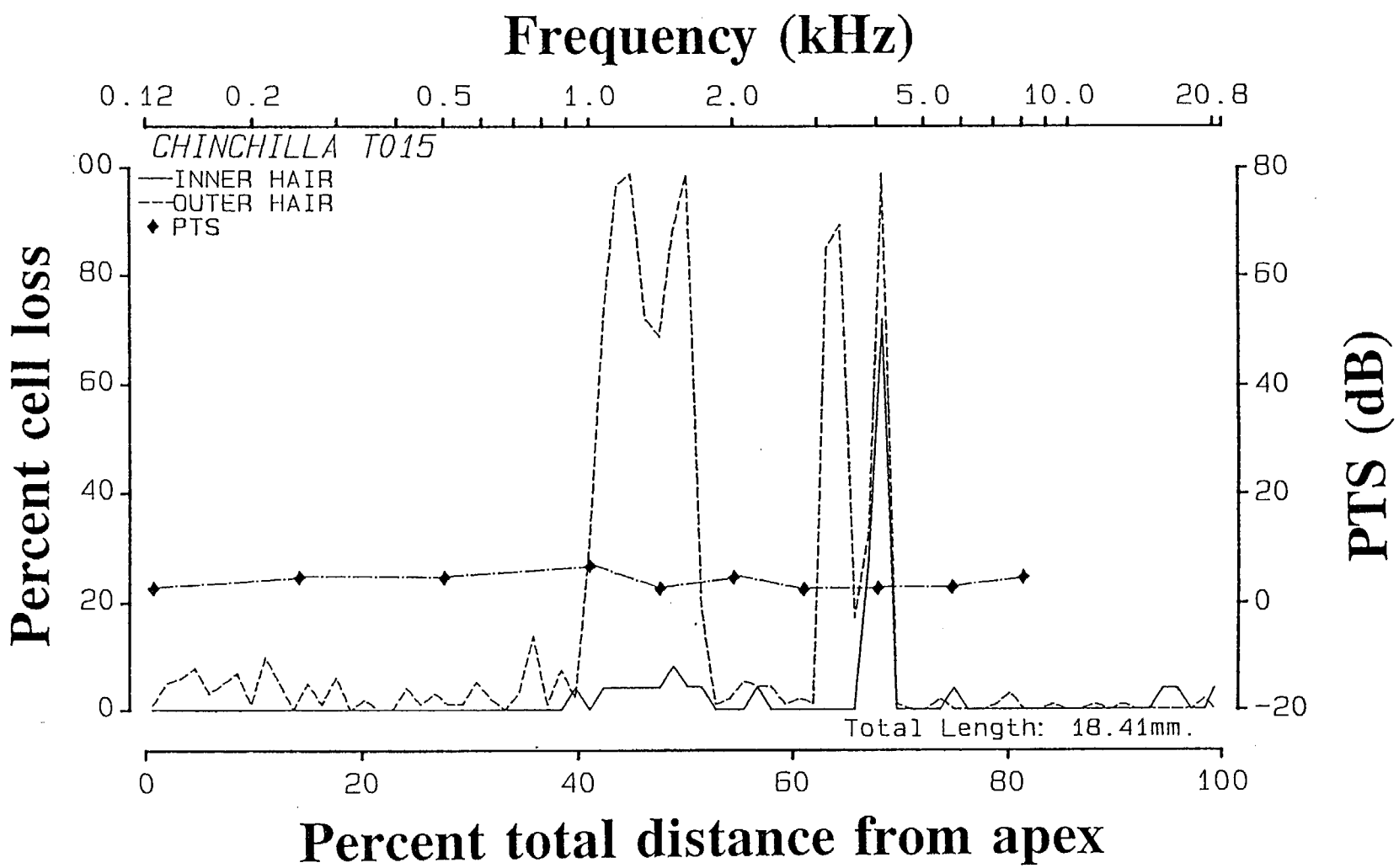
Total sensory cell losses over octave band frequencies

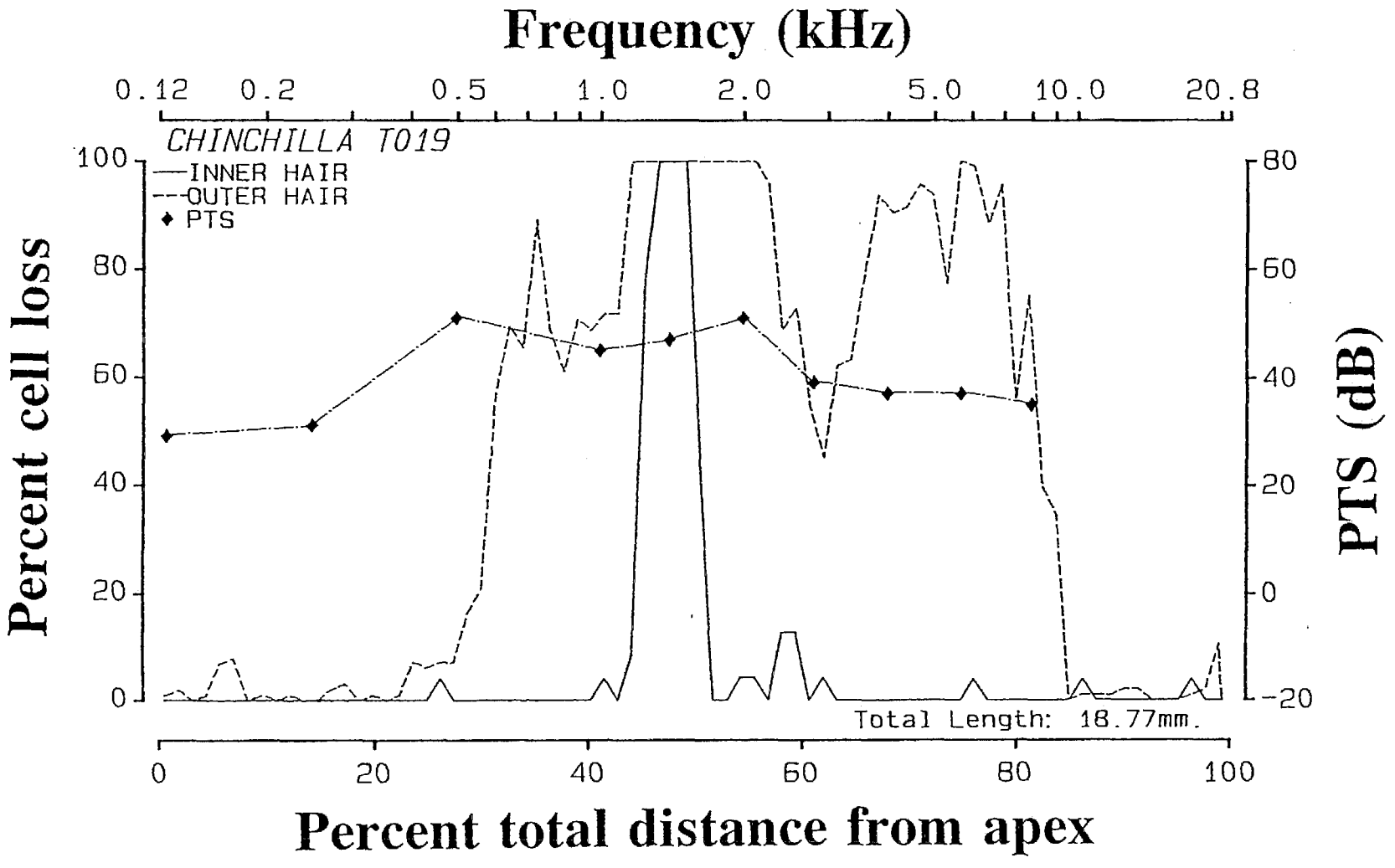
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group standard deviations							
0.125 kHz	2.5	4.0	2.8	12.2	14.1	0.0	4.1
0.25 kHz	5.1	4.4	5.3	16.6	21.6	0.0	0.0
0.5 kHz	5.6	65.9	69.2	39.4	172.9	7.9	25.3
1 kHz	59.0	62.9	63.6	78.3	200.5	116.5	74.3
2 kHz	24.9	90.9	85.2	92.4	262.4	55.3	40.5
4 kHz	14.6	129.7	131.3	109.9	370.5	16.9	17.4
8 kHz	4.0	87.7	77.6	81.1	241.5	0.5	0.0
16 kHz	1.5	1.7	4.0	3.6	5.7	0.4	0.0
TOTALS	88.8	385.5	390.3	339.3	1114.2	121.2	95.8

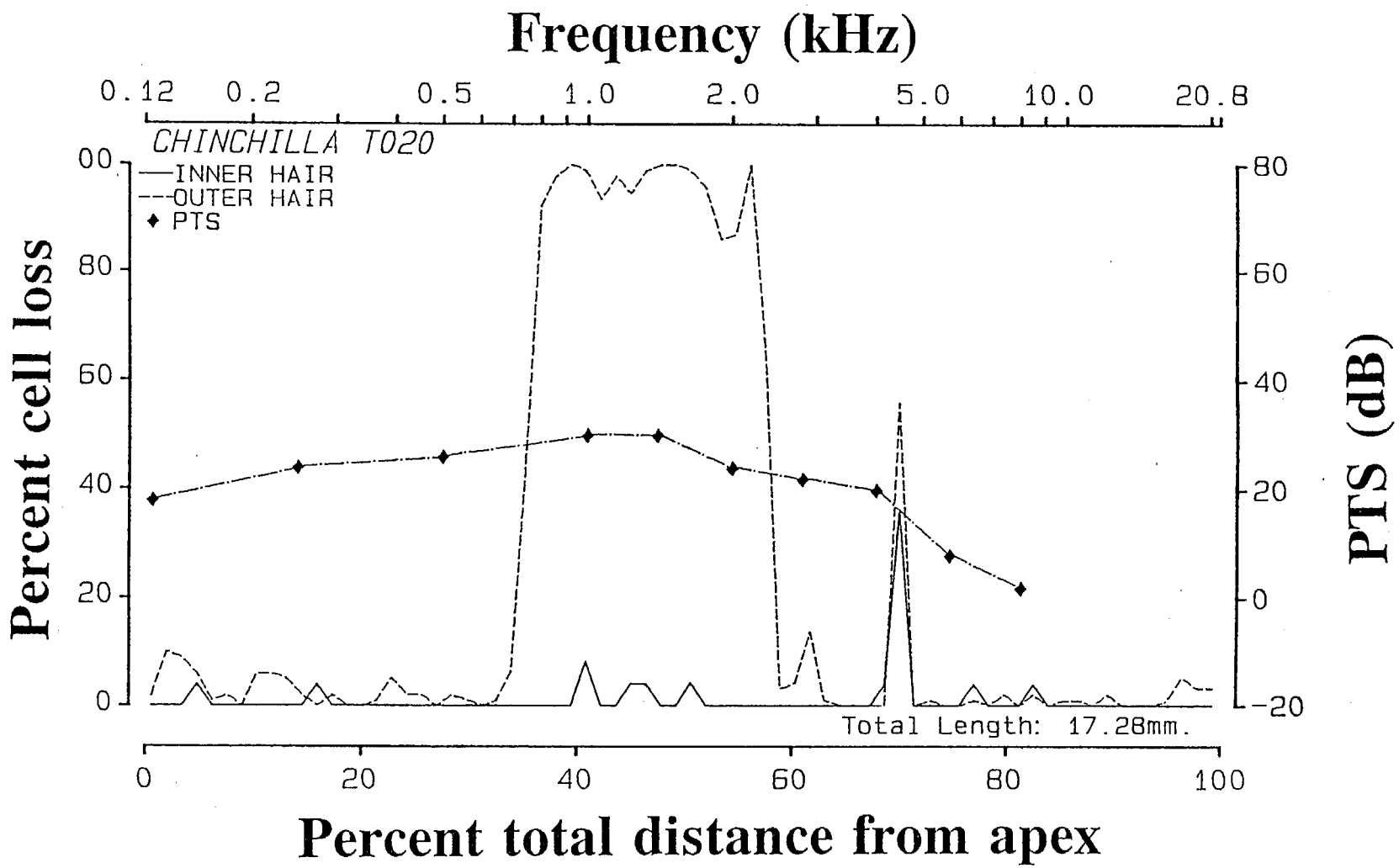
2450 Hz center frequency, 144 dB peak SPL

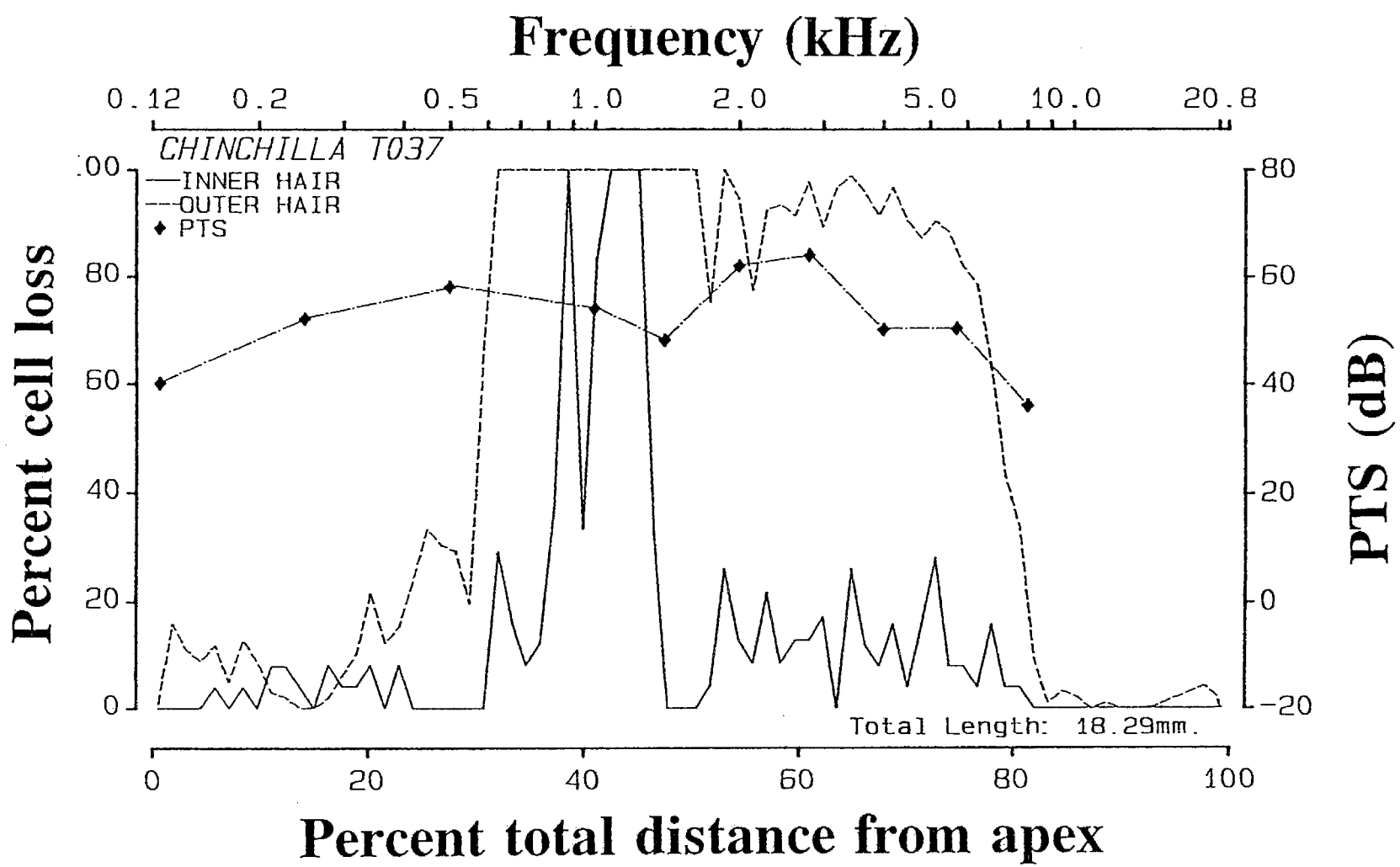
Percent sensory cell losses over octave band frequencies

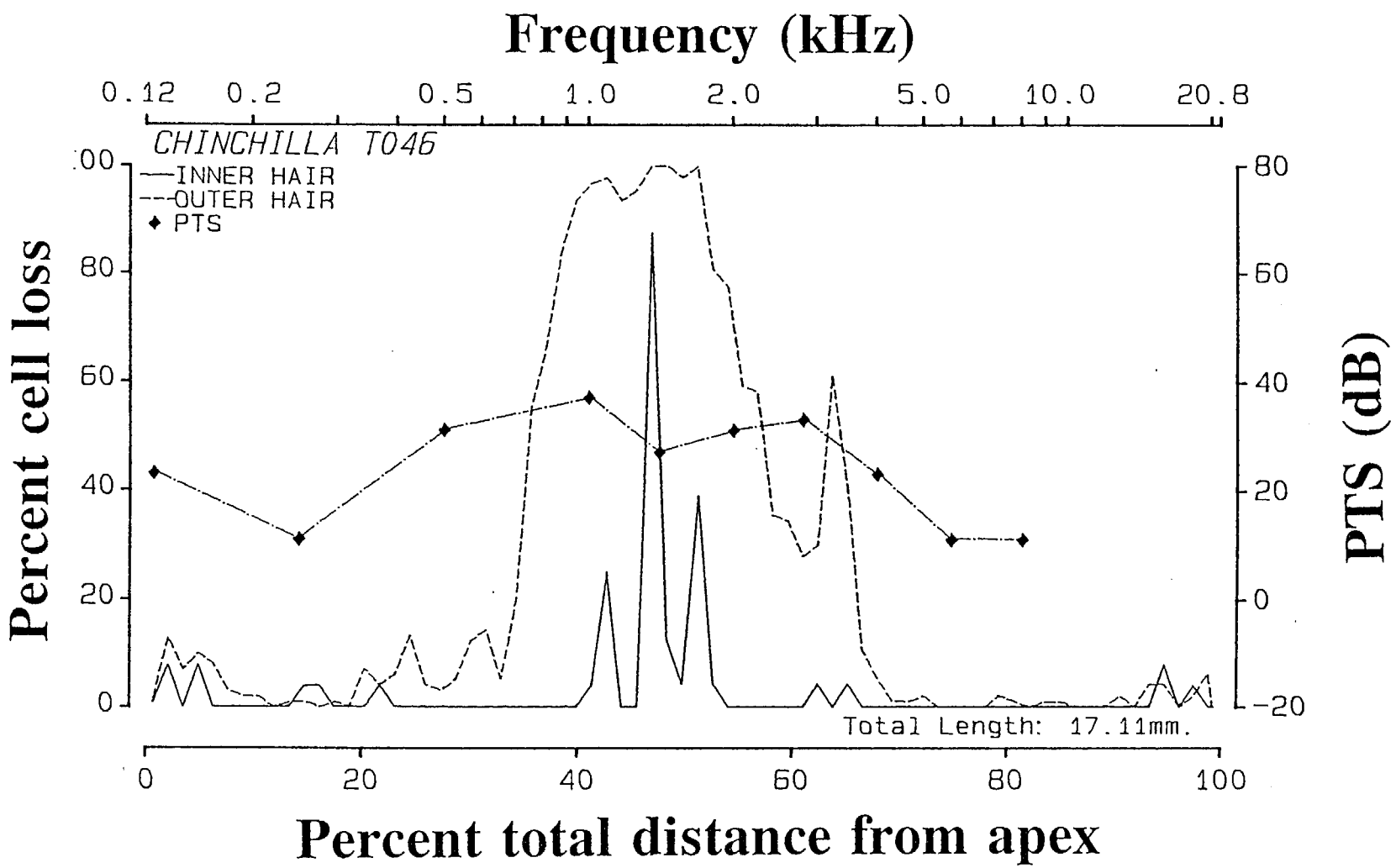
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group standard deviations							
0.125 kHz	1.89	2.13	1.64	6.94	2.73	0.00	2.09
0.25 kHz	2.04	1.42	1.61	5.04	2.19	0.00	0.00
0.5 kHz	2.25	20.13	21.11	12.00	17.55	1.55	7.73
1 kHz	24.40	20.67	20.50	25.86	21.93	23.05	23.72
2 kHz	10.16	28.67	26.44	28.02	26.95	10.55	12.52
4 kHz	5.63	39.93	40.37	33.76	37.98	3.29	5.38
8 kHz	1.53	26.96	23.96	24.77	24.70	0.09	0.00
16 kHz	0.61	0.57	1.25	1.30	0.63	0.09	0.00


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T015
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.41mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T019
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.77mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T020
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.28mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T037
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.29mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T046
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.11mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

3550 Hz center frequency, 124 dB peak SPL

Animal #		
T023	-	Completed the entire protocol
T052	-	Completed the entire protocol
T054	-	Completed the entire protocol
T072	-	Completed the entire protocol
T073	-	Completed the entire protocol
T104	-	Completed the entire protocol

3550 Hz center frequency, 124 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T023	25.0	8.0	-2.0	-2.0	-1.0	1.0	-5.0	3.0	2.0	9.0
T052	23.0	8.0	0.0	-4.0	-3.0	1.0	-1.0	1.0	2.0	1.0
T054	24.0	7.0	1.0	1.0	2.0	4.0	-4.0	0.0	-1.0	4.0
T072	24.0	3.0	5.0	1.0	2.0	0.0	2.0	0.0	5.0	3.0
T073	19.0	6.0	4.0	2.0	1.0	1.0	1.0	1.0	4.0	1.0
T104	21.0	6.0	4.0	2.0	3.0	3.0	3.0	1.0	0.0	5.0
Mean	22.7	6.3	2.0	0.0	0.7	1.7	-0.7	1.0	2.0	3.8
S.D.	2.3	1.9	2.8	2.5	2.3	1.5	3.3	1.1	2.3	3.0

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T023	28.0	11.0	3.0	3.0	4.0	2.0	4.0	4.0	7.0	8.0
T052	23.0	9.2	3.2	5.2	2.2	2.2	2.2	10.2	3.2	4.2
T054	26.0	11.0	1.0	5.0	8.0	2.0	2.0	4.0	5.0	4.0
T072	24.6	1.6	5.6	1.6	2.6	0.6	0.6	0.6	3.6	0.6
T073	18.0	13.0	1.0	1.0	0.0	4.0	4.0	0.0	7.0	10.0
T104	24.0	11.0	5.0	1.0	2.0	4.0	-2.0	6.0	5.0	10.0
Mean	23.9	9.5	3.1	2.8	3.1	2.5	1.8	4.1	5.1	6.1
S.D.	3.4	4.0	1.9	1.9	2.7	1.3	2.3	3.7	1.6	3.8

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
T023	3.0	3.0	5.0	5.0	5.0	1.0	9.0	1.0	5.0	-1.0
T052	0.0	1.2	3.2	9.2	5.2	1.2	3.2	9.2	1.2	3.2
T054	2.0	4.0	0.0	4.0	6.0	-2.0	6.0	4.0	6.0	0.0
T072	0.6	-1.4	0.6	0.6	0.6	0.6	-1.4	0.6	-1.4	-2.4
T073	-1.0	7.0	-3.0	-1.0	-1.0	3.0	3.0	-1.0	3.0	9.0
T104	3.0	5.0	1.0	-1.0	-1.0	1.0	-5.0	5.0	5.0	5.0
Mean	1.3	3.1	1.1	2.8	2.5	0.8	2.5	3.1	3.1	2.3
S.D.	1.7	3.0	2.8	4.0	3.3	1.6	5.0	3.7	2.8	4.3

Temporary Threshold Shift (dB): 3550 Hz center frequency, 124 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	4.0	14.0	13.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	2.0	1.0	14.0
T052	6.0	6.0	14.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-8.0	4.0	3.0	2.0	1.0	-10.0	14.0
T054	5.0	4.0	3.0	2.0	1.0	0.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	4.0	3.0	2.0	5.0
T072	-2.0	-4.0	5.0	3.0	1.0	-1.0	-3.0	4.0	2.0	0.0	-2.0	-4.0	5.0	3.0	1.0	5.0
T073	5.0	4.0	-7.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	6.0	5.0	4.0	-7.0	-8.0	1.0	6.0
T104	11.0	20.0	9.0	18.0	17.0	6.0	-5.0	4.0	-7.0	2.0	1.0	0.0	9.0	-2.0	7.0	20.0
Mean	4.8	7.3	6.2	5.0	3.8	1.0	-1.7	0.3	-2.5	-1.2	1.5	2.0	2.7	-0.2	0.3	10.7
S.D.	4.2	8.4	7.8	6.4	6.5	2.5	2.0	2.9	2.9	4.9	3.8	3.4	5.3	4.3	5.6	6.2

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	22.0	12.0	21.0	20.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	11.0	0.0	-1.0	22.0
T052	3.0	12.0	10.0	9.0	8.0	7.0	-4.0	-5.0	-6.0	-2.0	0.0	-1.0	8.0	-3.0	2.0	12.0
T054	13.0	2.0	11.0	0.0	9.0	8.0	-2.0	-3.0	6.0	-5.0	4.0	3.0	2.0	11.0	0.0	13.0
T072	0.0	-2.0	-3.0	5.0	3.0	1.0	-1.0	6.0	4.0	2.0	0.0	-2.0	-3.0	-5.0	3.0	6.0
T073	9.0	8.0	7.0	6.0	5.0	4.0	3.0	12.0	1.0	10.0	9.0	8.0	7.0	6.0	5.0	12.0
T104	47.0	26.0	35.0	4.0	3.0	2.0	1.0	0.0	-1.0	8.0	7.0	6.0	5.0	4.0	3.0	47.0
Mean	15.7	9.7	13.5	7.3	6.2	5.0	0.7	2.7	1.5	2.8	3.8	2.7	5.0	2.2	2.0	18.7
S.D.	17.2	9.8	13.1	6.9	2.9	3.1	3.9	6.4	4.5	5.7	3.7	3.9	4.9	6.0	2.2	14.8

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	26.0	6.0	5.0	4.0	3.0	2.0	11.0	0.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	26.0
T052	15.0	24.0	12.0	21.0	-10.0	9.0	8.0	7.0	-4.0	0.0	2.0	1.0	10.0	-1.0	4.0	24.0
T054	13.0	2.0	1.0	0.0	9.0	-2.0	-2.0	-3.0	6.0	5.0	4.0	-7.0	2.0	1.0	0.0	13.0
T072	2.0	0.0	-1.0	7.0	5.0	3.0	1.0	-2.0	6.0	-6.0	2.0	0.0	-1.0	-3.0	5.0	7.0
T073	5.0	4.0	3.0	2.0	1.0	10.0	-1.0	-2.0	-3.0	6.0	5.0	-6.0	-7.0	-8.0	1.0	10.0
T104	13.0	12.0	11.0	0.0	-1.0	8.0	-3.0	-4.0	5.0	4.0	3.0	2.0	1.0	0.0	-1.0	13.0
Mean	12.3	8.0	5.2	5.7	1.2	5.0	2.3	-0.7	3.2	2.8	3.8	-0.7	1.7	-1.2	2.0	15.5
S.D.	8.4	8.9	5.3	8.0	6.5	4.7	5.8	4.0	5.3	5.1	1.9	5.0	5.7	4.1	2.4	7.7

Temporary Threshold Shift (dB): 3550 Hz center frequency, 124 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	18.0	8.0	7.0	6.0	5.0	4.0	3.0	12.0	11.0	0.0	9.0	-2.0	7.0	6.0	5.0	18.0
T052	11.0	20.0	8.0	17.0	6.0	15.0	14.0	3.0	2.0	11.0	8.0	7.0	6.0	15.0	10.0	20.0
T054	25.0	4.0	13.0	12.0	11.0	10.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	25.0
T072	8.0	6.0	5.0	3.0	1.0	9.0	-3.0	14.0	2.0	0.0	-2.0	-4.0	5.0	3.0	1.0	14.0
T073	9.0	-2.0	7.0	-4.0	-5.0	4.0	13.0	2.0	1.0	10.0	-1.0	-2.0	7.0	-4.0	-5.0	13.0
T104	17.0	16.0	15.0	14.0	13.0	12.0	11.0	0.0	-1.0	8.0	-3.0	6.0	-5.0	-6.0	3.0	17.0
Mean	14.7	8.7	9.2	8.0	5.2	9.0	8.0	6.7	3.8	6.0	2.8	1.7	4.0	2.8	2.7	17.8
S.D.	6.5	8.1	3.9	7.8	6.6	4.4	6.6	5.8	4.6	4.9	5.4	4.8	4.6	7.5	4.9	4.4

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	16.0	-4.0	5.0	4.0	3.0	12.0	11.0	10.0	9.0	-2.0	7.0	6.0	5.0	4.0	3.0	16.0
T052	29.0	8.0	16.0	15.0	4.0	3.0	12.0	11.0	10.0	-1.0	6.0	5.0	4.0	3.0	8.0	29.0
T054	23.0	2.0	1.0	0.0	-1.0	-2.0	-2.0	-3.0	-4.0	5.0	-6.0	13.0	12.0	11.0	0.0	23.0
T072	6.0	4.0	3.0	11.0	-1.0	7.0	5.0	2.0	0.0	-2.0	6.0	4.0	-7.0	1.0	-1.0	11.0
T073	19.0	8.0	7.0	6.0	-5.0	4.0	13.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	19.0
T104	25.0	24.0	23.0	12.0	11.0	10.0	19.0	8.0	7.0	6.0	-5.0	-6.0	3.0	2.0	1.0	25.0
Mean	19.7	7.0	9.2	8.0	1.8	5.7	9.7	5.0	3.8	1.0	1.2	3.3	2.3	2.8	2.7	20.5
S.D.	8.1	9.4	8.5	5.6	5.5	5.1	7.3	5.5	5.6	3.6	5.9	6.6	6.6	4.9	3.4	6.5

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	24.0	14.0	3.0	2.0	11.0	0.0	9.0	8.0	7.0	-4.0	-5.0	4.0	13.0	2.0	-9.0	24.0
T052	15.0	4.0	12.0	11.0	0.0	9.0	-2.0	-3.0	6.0	0.0	2.0	1.0	0.0	-1.0	4.0	15.0
T054	11.0	10.0	-1.0	8.0	7.0	-4.0	-4.0	5.0	-6.0	-7.0	-8.0	1.0	0.0	-1.0	-2.0	11.0
T072	8.0	-4.0	5.0	3.0	11.0	9.0	7.0	4.0	2.0	0.0	-2.0	-4.0	5.0	3.0	1.0	11.0
T073	-1.0	8.0	27.0	6.0	5.0	4.0	3.0	2.0	1.0	10.0	-1.0	8.0	7.0	6.0	-5.0	27.0
T104	45.0	24.0	3.0	12.0	11.0	10.0	9.0	8.0	7.0	-4.0	5.0	-6.0	3.0	2.0	1.0	45.0
Mean	17.0	9.3	8.2	7.0	7.5	4.7	3.7	4.0	2.8	-0.8	-1.5	0.7	4.7	1.8	-1.7	22.2
S.D.	16.0	9.4	10.2	4.1	4.5	5.7	5.7	4.2	5.0	5.9	4.7	5.1	4.9	2.6	4.7	13.0

Temporary Threshold Shift (dB): 3550 Hz center frequency, 124 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	20.0	20.0	9.0	8.0	17.0	6.0	5.0	14.0	3.0	12.0	11.0	10.0	9.0	8.0	7.0	20.0
T052	7.0	16.0	24.0	23.0	12.0	1.0	10.0	8.0	8.0	12.0	4.0	3.0	2.0	1.0	6.0	24.0
T054	19.0	18.0	7.0	16.0	5.0	14.0	14.0	13.0	2.0	11.0	10.0	-1.0	18.0	-3.0	6.0	19.0
T072	6.0	4.0	3.0	1.0	-1.0	-3.0	5.0	2.0	0.0	-2.0	-4.0	-6.0	3.0	1.0	-1.0	6.0
T073	9.0	8.0	17.0	16.0	5.0	4.0	3.0	2.0	11.0	0.0	-1.0	8.0	-3.0	6.0	5.0	17.0
T104	45.0	44.0	13.0	12.0	11.0	10.0	-1.0	-2.0	-3.0	6.0	-5.0	-6.0	-7.0	-8.0	1.0	45.0
Mean	17.7	18.3	12.2	12.7	8.2	5.3	6.0	6.2	3.5	6.5	2.5	1.3	3.7	0.8	4.0	21.8
S.D.	14.7	14.0	7.6	7.6	6.4	6.1	5.3	6.5	5.2	6.2	6.9	6.9	8.9	5.8	3.2	12.9

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	12.0	12.0	1.0	0.0	-1.0	8.0	7.0	6.0	5.0	14.0	-7.0	2.0	1.0	10.0	-1.0	14.0
T052	5.0	14.0	12.0	11.0	0.0	-1.0	-2.0	-3.0	6.0	0.0	12.0	11.0	10.0	9.0	4.0	14.0
T054	5.0	4.0	13.0	12.0	11.0	0.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	13.0
T072	-2.0	6.0	5.0	3.0	1.0	-1.0	7.0	4.0	2.0	10.0	-2.0	-4.0	5.0	3.0	1.0	10.0
T073	9.0	18.0	7.0	6.0	15.0	4.0	3.0	1.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	5.0	18.0
T104	37.0	16.0	45.0	4.0	13.0	2.0	1.0	0.0	-1.0	-2.0	7.0	6.0	5.0	4.0	3.0	45.0
Mean	11.0	11.7	13.8	6.0	6.5	2.0	4.3	2.8	3.5	4.8	2.5	3.0	3.7	4.2	2.3	19.0
S.D.	13.6	5.6	15.9	4.7	7.3	3.5	4.5	4.4	3.4	6.5	7.0	5.5	4.4	5.0	2.2	13.0

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	22.0	22.0	1.0	0.0	9.0	-2.0	7.0	-4.0	5.0	14.0	3.0	2.0	11.0	0.0	9.0	22.0
T052	13.0	12.0	20.0	9.0	-2.0	-3.0	6.0	-5.0	-6.0	-2.0	10.0	-1.0	-2.0	-3.0	2.0	20.0
T054	5.0	4.0	3.0	12.0	1.0	0.0	0.0	-1.0	8.0	-3.0	6.0	5.0	4.0	13.0	2.0	13.0
T072	2.0	0.0	-1.0	-3.0	5.0	-7.0	1.0	-2.0	-4.0	-6.0	2.0	0.0	-1.0	-3.0	-5.0	5.0
T073	5.0	4.0	3.0	2.0	11.0	10.0	9.0	8.0	-3.0	6.0	5.0	4.0	3.0	2.0	1.0	11.0
T104	47.0	46.0	45.0	14.0	3.0	2.0	1.0	0.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	47.0
Mean	15.7	14.7	11.8	5.7	4.5	0.0	4.0	-0.7	1.5	2.8	5.5	2.7	3.3	2.2	2.0	19.7
S.D.	17.0	17.2	17.9	6.9	4.9	5.8	3.8	4.6	6.6	7.7	2.9	2.8	4.7	6.0	4.5	14.8

Temporary Threshold Shift (dB): 3550 Hz center frequency, 124 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
T023	10.0	0.0	-1.0	-2.0	-3.0	6.0	-5.0	-6.0	-7.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	10.0
T052	19.0	8.0	6.0	15.0	14.0	3.0	2.0	1.0	0.0	-5.0	6.0	5.0	4.0	3.0	-2.0	19.0
T054	5.0	14.0	3.0	12.0	1.0	0.0	0.0	-1.0	-2.0	7.0	-4.0	5.0	-6.0	3.0	2.0	14.0
T072	-1.0	-3.0	-4.0	4.0	2.0	0.0	-2.0	5.0	3.0	1.0	-1.0	-3.0	-4.0	-6.0	2.0	5.0
T073	3.0	2.0	1.0	0.0	9.0	8.0	7.0	6.0	5.0	4.0	13.0	2.0	11.0	10.0	9.0	13.0
T104	17.0	16.0	25.0	4.0	3.0	2.0	1.0	0.0	9.0	-2.0	7.0	6.0	5.0	4.0	3.0	25.0
Mean	8.8	6.2	5.0	5.5	4.3	3.2	0.5	0.8	1.3	1.2	3.7	2.5	1.5	2.0	1.8	14.3
S.D.	8.0	7.8	10.4	6.7	6.1	3.3	4.0	4.4	5.6	4.3	6.2	3.5	6.3	5.5	4.3	7.0

3550 Hz center frequency, 124 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
T023	2	19	19	42	80
T052	9	25	43	88	156
T054	19	174	135	209	518
T072	13	25	28	59	112
T073	6	33	36	43	112
T104	101	239	295	344	878
Group mean	25				309
S.D.	38				323
S.E.	15				132

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	0.8	36.5
	0.25 kHz	0.7	26.5
	0.5 kHz	0.3	19.7
	1 kHz	4.2	40.0
	2 kHz	1.7	26.3
	4 kHz	1.2	14.5
	8 kHz	15.0	120.7
	16 kHz	1.2	25.2
Standard deviations			
	0.125 kHz	0.8	13.6
	0.25 kHz	0.8	17.3
	0.5 kHz	0.5	15.7
	1 kHz	5.8	47.5
	2 kHz	1.4	31.7
	4 kHz	2.0	10.4
	8 kHz	35.3	248.0
	16 kHz	1.5	21.1

3550 Hz center frequency, 124 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T023							
0.125 kHz	0	1	5	11	17	0	0
0.25 kHz	0	4	4	17	25	0	0
0.5 kHz	0	1	3	8	12	0	0
1 kHz	0	8	0	1	9	0	0
2 kHz	1	2	0	0	2	0	0
4 kHz	0	2	5	3	10	0	0
8 kHz	1	1	1	1	3	1	0
16 kHz	0	0	1	1	2	0	0
TOTALS	2	19	19	42	80	1	0
Chinchilla T052							
0.125 kHz	1	2	7	29	38	0	0
0.25 kHz	2	5	6	9	20	0	0
0.5 kHz	1	6	11	5	22	0	0
1 kHz	1	3	5	17	25	0	0
2 kHz	0	2	0	18	20	0	0
4 kHz	0	2	1	4	7	0	0
8 kHz	1	0	1	1	2	0	0
16 kHz	3	5	12	5	22	0	0
TOTALS	9	25	43	88	156	0	0
Chinchilla T054							
0.125 kHz	1	5	13	38	56	0	0
0.25 kHz	0	10	6	45	61	0	0
0.5 kHz	1	16	10	24	50	0	0
1 kHz	15	40	45	48	133	35	30
2 kHz	2	12	7	16	35	1	0
4 kHz	0	14	4	17	35	0	0
8 kHz	0	54	23	12	89	0	0
16 kHz	0	23	27	9	59	0	0
TOTALS	19	174	135	209	518	36	30

3550 Hz center frequency, 124 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla T072							
0.125 kHz	2	5	7	26	38	1	0
0.25 kHz	1	8	1	6	15	0	0
0.5 kHz	0	3	7	6	16	0	0
1 kHz	3	4	3	8	15	0	1
2 kHz	4	0	0	3	3	0	0
4 kHz	2	2	3	3	8	0	0
8 kHz	1	1	1	3	5	0	0
16 kHz	0	2	6	4	12	0	0
TOTALS	13	25	28	59	112	1	1
Chinchilla T073							
0.125 kHz	1	5	6	15	26	0	0
0.25 kHz	0	6	10	6	22	0	0
0.5 kHz	0	2	4	3	9	0	0
1 kHz	0	3	3	6	12	0	0
2 kHz	2	8	1	3	12	1	0
4 kHz	0	4	5	4	13	0	0
8 kHz	0	1	0	2	3	0	0
16 kHz	3	4	7	4	15	2	3
TOTALS	6	33	36	43	112	3	3
Chinchilla T104							
0.125 kHz	0	4	16	24	44	0	0
0.25 kHz	1	4	2	10	16	0	0
0.5 kHz	0	1	2	6	9	0	0
1 kHz	6	3	15	28	46	0	0
2 kHz	1	24	31	31	86	0	8
4 kHz	5	5	6	3	14	0	0
8 kHz	87	191	211	220	622	149	94
16 kHz	1	7	12	22	41	0	0
TOTALS	101	239	295	344	878	149	102

3550 Hz center frequency, 124 dB peak SPL

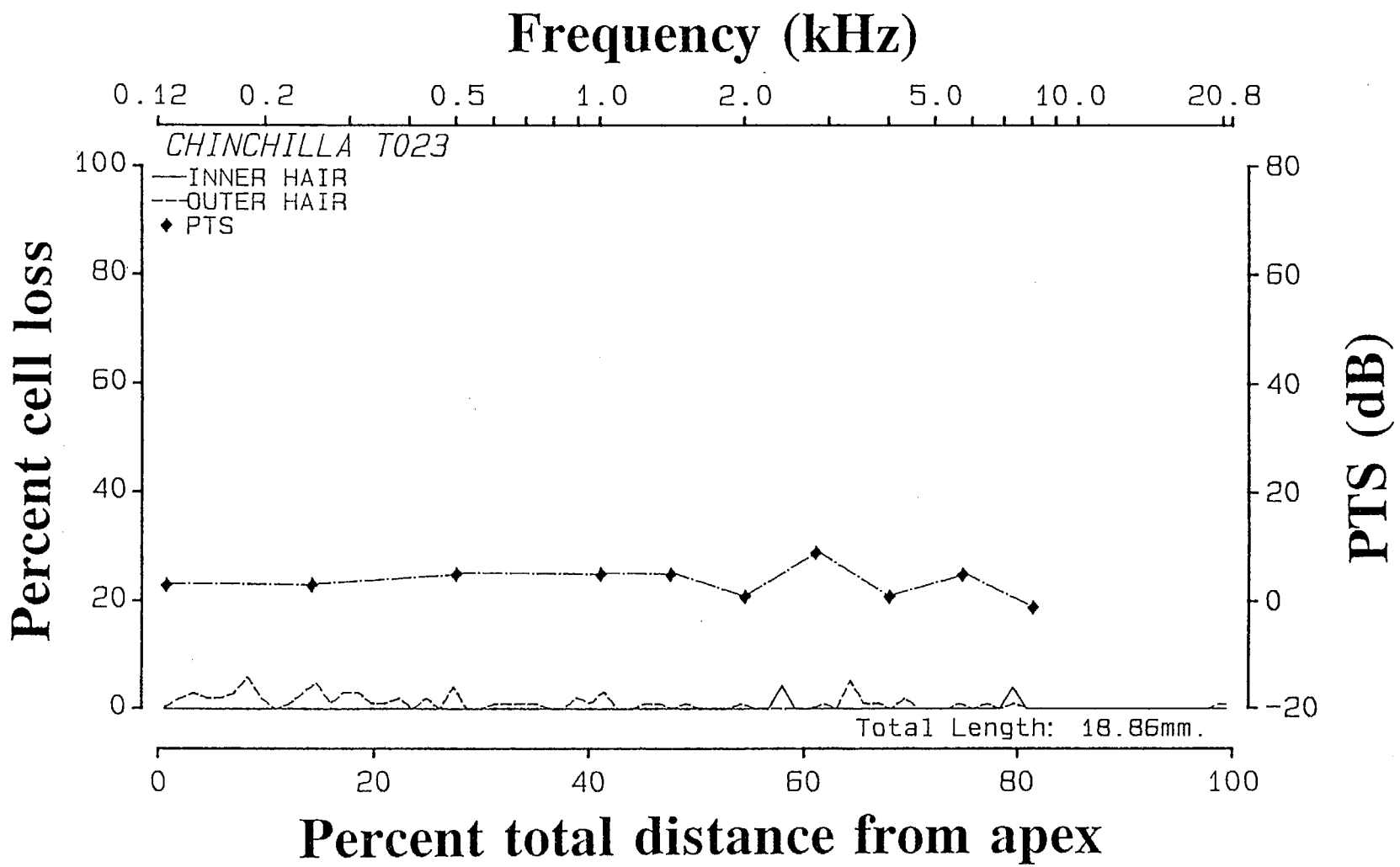
Total sensory cell losses over octave band frequencies

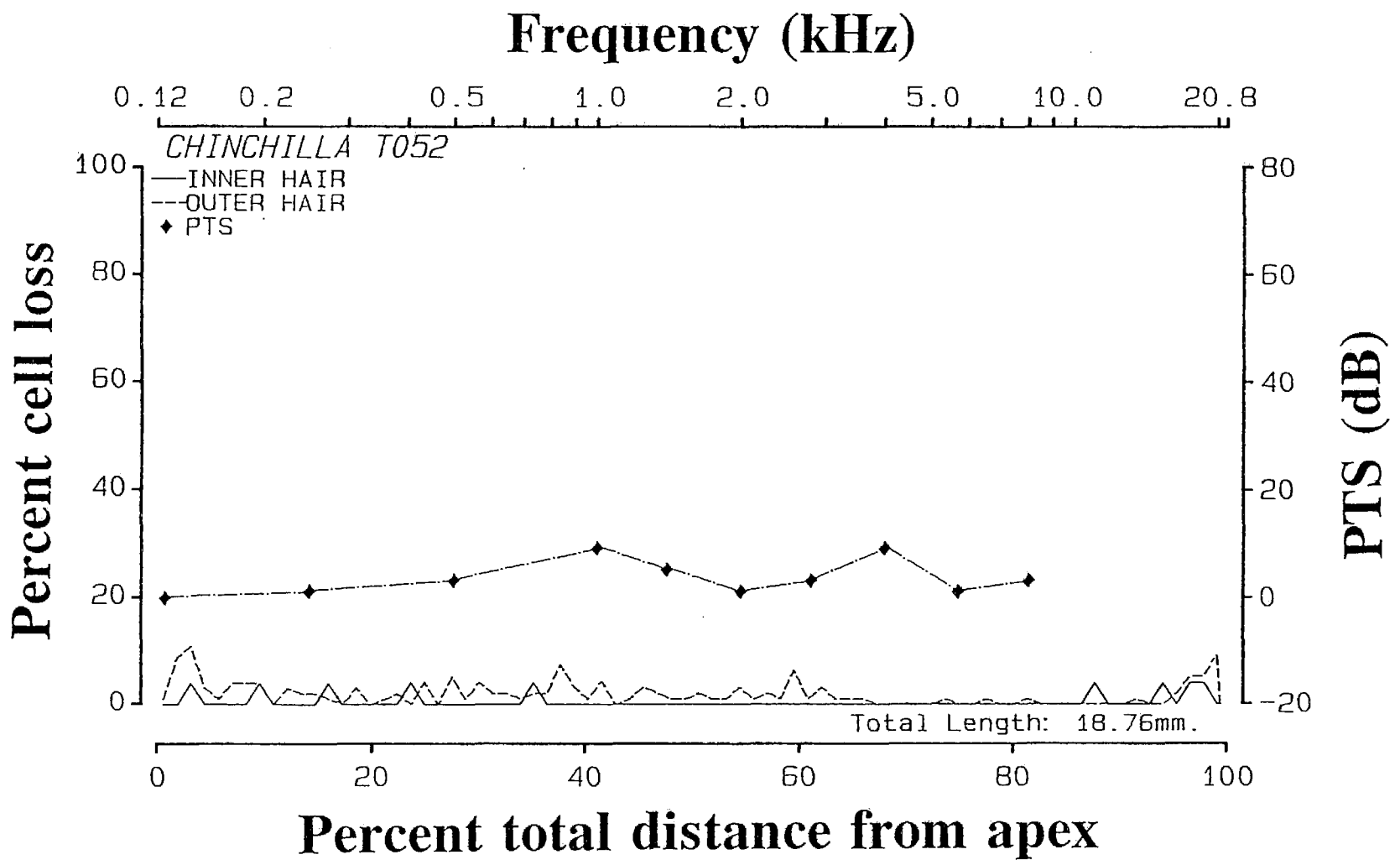
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	0.8	3.7	9.0	23.8	36.5	0.2	0.0
0.25 kHz	0.7	6.2	4.8	15.5	26.5	0.0	0.0
0.5 kHz	0.3	4.8	6.2	8.7	19.7	0.0	0.0
1 kHz	4.2	10.2	11.8	18.0	40.0	5.8	5.2
2 kHz	1.7	8.0	6.5	11.8	26.3	0.3	1.3
4 kHz	1.2	4.8	4.0	5.7	14.5	0.0	0.0
8 kHz	15.0	41.3	39.5	39.8	120.7	25.0	15.7
16 kHz	1.2	6.8	10.8	7.5	25.2	0.3	0.5
TOTALS	25.0	85.8	92.7	130.8	309.3	31.7	22.7
Group standard deviations							
0.125 kHz	0.8	1.8	4.4	9.7	13.6	0.4	0.0
0.25 kHz	0.8	2.4	3.3	15.0	17.3	0.0	0.0
0.5 kHz	0.5	5.8	3.8	7.7	15.7	0.0	0.0
1 kHz	5.8	14.7	17.0	17.5	47.5	14.3	12.2
2 kHz	1.4	9.0	12.3	12.0	31.7	0.5	3.3
4 kHz	2.0	4.7	1.8	5.6	10.4	0.0	0.0
8 kHz	35.3	76.4	84.5	88.4	248.0	60.7	38.4
16 kHz	1.5	8.3	8.9	7.6	21.1	0.8	1.2
TOTALS	37.7	95.8	107.7	121.8	322.8	59.1	40.6

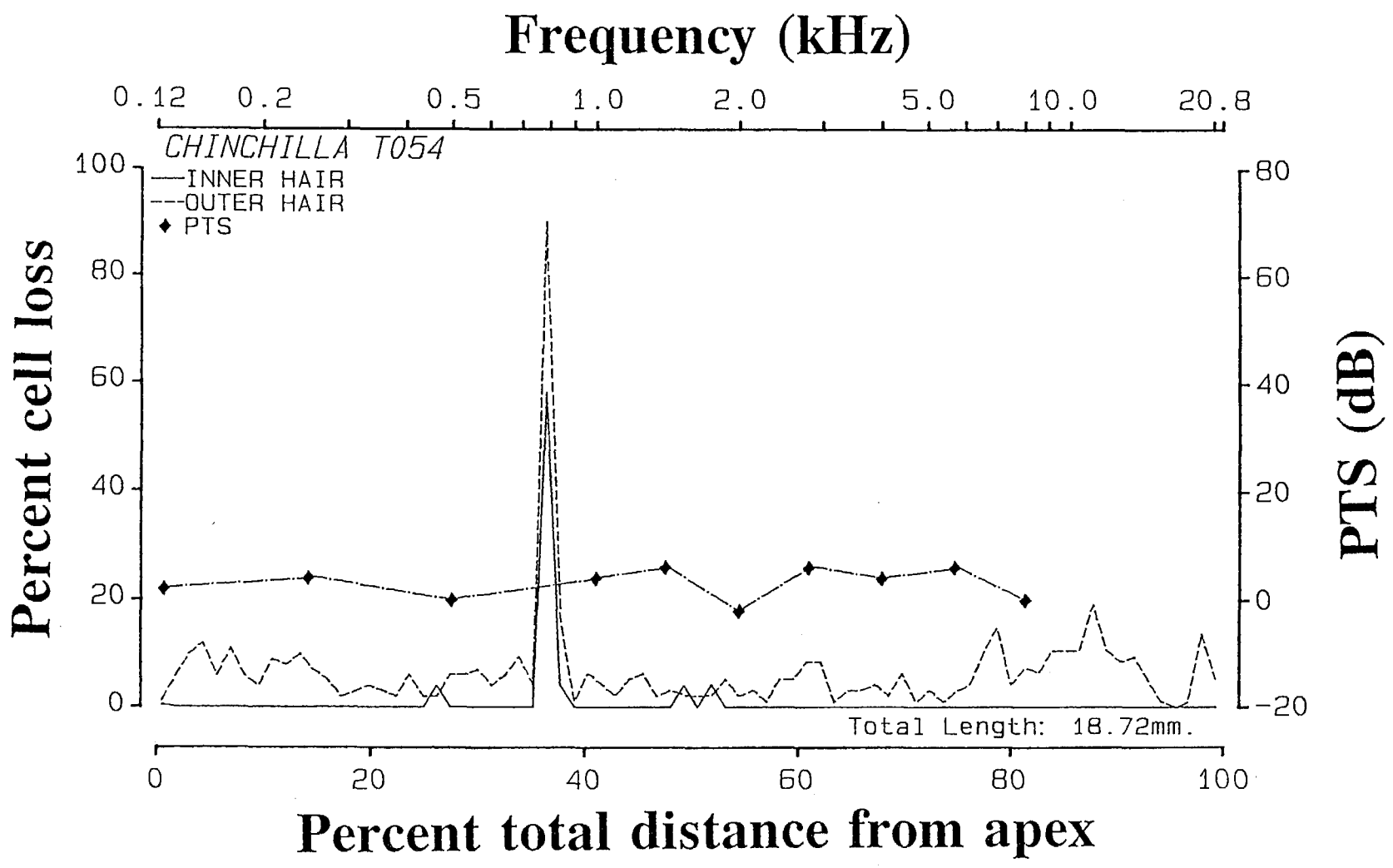
3550 Hz center frequency, 124 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	0.55	1.95	4.78	12.72	6.48	0.05	0.00
0.25 kHz	0.25	1.82	1.40	4.62	2.61	0.00	0.00
0.5 kHz	0.10	1.40	1.82	2.58	1.93	0.00	0.00
1 kHz	1.70	3.17	3.73	5.73	4.21	1.12	1.60
2 kHz	0.68	2.52	2.08	3.70	2.77	0.03	0.43
4 kHz	0.47	1.47	1.22	1.72	1.47	0.00	0.00
8 kHz	6.05	13.33	12.83	12.98	13.05	5.05	5.13
16 kHz	0.45	2.30	3.63	2.57	2.83	0.07	0.15
Group standard deviations							
0.125 kHz	0.52	0.96	2.48	5.14	2.46	0.12	0.00
0.25 kHz	0.29	0.74	0.97	4.41	1.67	0.00	0.00
0.5 kHz	0.15	1.70	1.11	2.26	1.53	0.00	0.00
1 kHz	2.31	4.61	5.32	5.52	4.95	2.74	3.77
2 kHz	0.58	2.92	4.01	3.87	3.44	0.05	1.06
4 kHz	0.82	1.40	0.56	1.71	1.05	0.00	0.00
8 kHz	14.33	25.00	27.70	28.99	27.11	12.32	12.57
16 kHz	0.56	2.82	3.06	2.75	2.44	0.16	0.37


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T023
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.86mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T052
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.76mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA T054
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.72mm.
0
20
40
60
80
100
Percent total distance from apex

3550 Hz center frequency, 129 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P46	26.0	11.0	-1.0	-1.0	-2.0	-2.0	-2.0	-2.0	-1.0	8.0
P53	18.0	13.0	1.0	1.0	-4.0	2.0	0.0	0.0	3.0	6.0
S07	26.0	7.0	-1.0	0.0	2.0	0.0	2.0	2.0	3.0	6.0
S08	25.0	4.0	4.0	2.0	5.0	-1.0	3.0	1.0	2.0	3.0
S11	23.0	10.0	0.0	2.0	1.0	3.0	1.0	1.0	0.0	7.0
S20	24.0	3.0	5.0	1.0	4.0	0.0	2.0	2.0	3.0	2.0
Mean	23.7	8.0	1.3	0.8	1.0	0.3	1.0	0.7	1.7	5.3
S.D.	3.0	4.0	2.6	1.2	3.5	1.9	1.8	1.5	1.8	2.3

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P46	33.0	22.0	8.0	18.0	17.0	13.0	23.0	15.0	20.0	13.0
P53	25.0	20.0	12.0	18.0	21.0	19.0	21.0	23.0	16.0	15.0
S07	27.8	10.8	4.8	4.8	1.8	3.8	3.8	9.8	4.8	11.8
S08	39.0	24.0	28.0	28.0	31.0	25.0	25.0	25.0	24.0	23.0
S11	24.6	7.6	5.6	5.6	4.6	6.6	4.6	4.6	9.6	10.6
S20	32.0	19.0	21.0	19.0	22.0	18.0	18.0	14.0	19.0	14.0
Mean	30.2	17.2	13.2	15.6	16.2	14.2	15.9	15.2	15.6	14.6
S.D.	5.5	6.5	9.4	8.9	11.1	8.0	9.4	7.7	7.1	4.4

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P46	7.0	11.0	9.0	19.0	19.0	15.0	25.0	17.0	21.0	5.0
P53	7.0	7.0	11.0	17.0	25.0	17.0	21.0	23.0	13.0	9.0
S07	1.8	3.8	5.8	4.8	-0.2	3.8	1.8	7.8	1.8	5.8
S08	14.0	20.0	24.0	26.0	26.0	26.0	22.0	24.0	22.0	20.0
S11	1.6	-2.4	5.6	3.6	3.6	3.6	3.6	3.6	9.6	3.6
S20	8.0	16.0	16.0	18.0	18.0	18.0	16.0	12.0	16.0	12.0
Mean	6.6	9.2	11.9	14.7	15.2	13.9	14.9	14.6	13.9	9.2
S.D.	4.6	8.2	7.1	8.8	11.0	8.7	9.9	8.2	7.6	6.1

Temporary Threshold Shift (dB): 3550 Hz center frequency, 129 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P46	13.0	31.0	29.0	27.0	25.0	32.0	20.0	28.0	6.0	14.0	13.0	1.0	-1.0	7.0	15.0	32.0
P53	31.0	19.0	17.0	5.0	3.0	10.0	18.0	16.0	24.0	12.0	11.0	9.0	7.0	5.0	3.0	31.0
S07	3.0	12.0	11.0	0.0	9.0	-2.0	7.0	-2.0	-3.0	-4.0	5.0	0.0	-1.0	8.0	-3.0	12.0
S08	16.0	14.0	12.0	30.0	28.0	16.0	14.0	22.0	10.0	18.0	16.0	14.0	12.0	20.0	8.0	30.0
S11	6.0	-5.0	4.0	13.0	12.0	1.0	0.0	-1.0	-2.0	3.0	2.0	3.0	2.0	1.0	0.0	13.0
S20	12.0	10.0	8.0	6.0	4.0	12.0	20.0	10.0	9.0	6.0	4.0	12.0	10.0	8.0	6.0	20.0
Mean	13.5	13.5	13.5	13.5	13.5	11.5	13.2	12.2	7.3	8.2	8.5	6.5	4.8	8.2	4.8	23.0
S.D.	9.8	11.8	8.7	12.4	10.6	12.1	8.1	12.2	9.8	8.1	5.6	6.0	5.6	6.4	6.4	9.2

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P46	19.0	47.0	35.0	43.0	41.0	48.0	46.0	34.0	22.0	20.0	-1.0	17.0	15.0	13.0	11.0	48.0
P53	27.0	25.0	23.0	21.0	29.0	26.0	14.0	12.0	0.0	8.0	7.0	5.0	3.0	11.0	9.0	29.0
S07	23.0	12.0	21.0	20.0	19.0	8.0	7.0	8.0	17.0	-4.0	5.0	10.0	-1.0	-2.0	7.0	23.0
S08	28.0	36.0	34.0	42.0	40.0	28.0	26.0	44.0	22.0	30.0	18.0	26.0	24.0	22.0	10.0	44.0
S11	0.0	9.0	8.0	-3.0	26.0	15.0	14.0	3.0	2.0	7.0	6.0	-3.0	-4.0	-5.0	-6.0	26.0
S20	24.0	22.0	20.0	18.0	16.0	24.0	32.0	22.0	30.0	28.0	16.0	14.0	22.0	10.0	18.0	32.0
Mean	20.2	25.2	23.5	23.5	28.5	24.8	23.2	20.5	15.5	14.8	8.5	11.5	9.8	8.2	8.2	33.7
S.D.	10.4	14.4	10.0	17.2	10.4	13.6	14.4	15.9	12.0	13.4	7.2	10.0	12.1	10.0	7.9	10.1

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P46	25.0	33.0	51.0	49.0	37.0	44.0	52.0	30.0	28.0	16.0	5.0	13.0	11.0	9.0	7.0	52.0
P53	33.0	21.0	29.0	27.0	25.0	12.0	20.0	18.0	16.0	24.0	13.0	11.0	9.0	7.0	15.0	33.0
S07	45.0	44.0	43.0	22.0	31.0	10.0	9.0	10.0	9.0	-2.0	7.0	12.0	1.0	10.0	-1.0	45.0
S08	32.0	30.0	18.0	36.0	24.0	22.0	30.0	38.0	26.0	24.0	22.0	30.0	28.0	26.0	14.0	38.0
S11	14.0	13.0	12.0	11.0	10.0	-1.0	18.0	7.0	6.0	11.0	0.0	1.0	10.0	9.0	8.0	18.0
S20	26.0	14.0	12.0	20.0	8.0	16.0	24.0	24.0	22.0	30.0	18.0	16.0	14.0	22.0	10.0	30.0
Mean	29.2	25.8	27.5	27.5	22.5	17.2	25.5	21.2	17.8	17.2	10.8	13.8	12.2	13.8	8.8	36.0
S.D.	10.3	12.1	16.5	13.4	11.5	15.2	14.7	11.9	9.0	11.5	8.3	9.4	8.9	8.0	5.8	11.9

Temporary Threshold Shift (dB): 3550 Hz center frequency, 129 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P46	21.0	49.0	47.0	55.0	53.0	40.0	28.0	16.0	14.0	12.0	1.0	9.0	7.0	5.0	3.0	55.0
P53	33.0	21.0	29.0	37.0	15.0	22.0	20.0	8.0	6.0	14.0	13.0	11.0	9.0	7.0	5.0	37.0
S07	43.0	42.0	41.0	40.0	19.0	38.0	17.0	18.0	17.0	-4.0	5.0	10.0	-1.0	8.0	7.0	43.0
S08	18.0	36.0	54.0	52.0	60.0	28.0	36.0	24.0	22.0	20.0	18.0	26.0	24.0	22.0	10.0	60.0
S11	2.0	1.0	-10.0	-1.0	-12.0	-3.0	6.0	-5.0	4.0	9.0	8.0	9.0	-2.0	7.0	-4.0	9.0
S20	34.0	32.0	20.0	18.0	6.0	14.0	22.0	12.0	20.0	18.0	16.0	4.0	12.0	20.0	8.0	34.0
Mean	25.2	30.2	30.2	33.5	23.5	23.2	21.5	12.2	13.8	11.5	10.2	11.5	8.2	11.5	4.8	39.7
S.D.	14.6	17.1	23.2	21.4	27.8	16.1	10.1	10.0	7.4	8.6	6.6	7.5	9.5	7.4	5.0	18.1

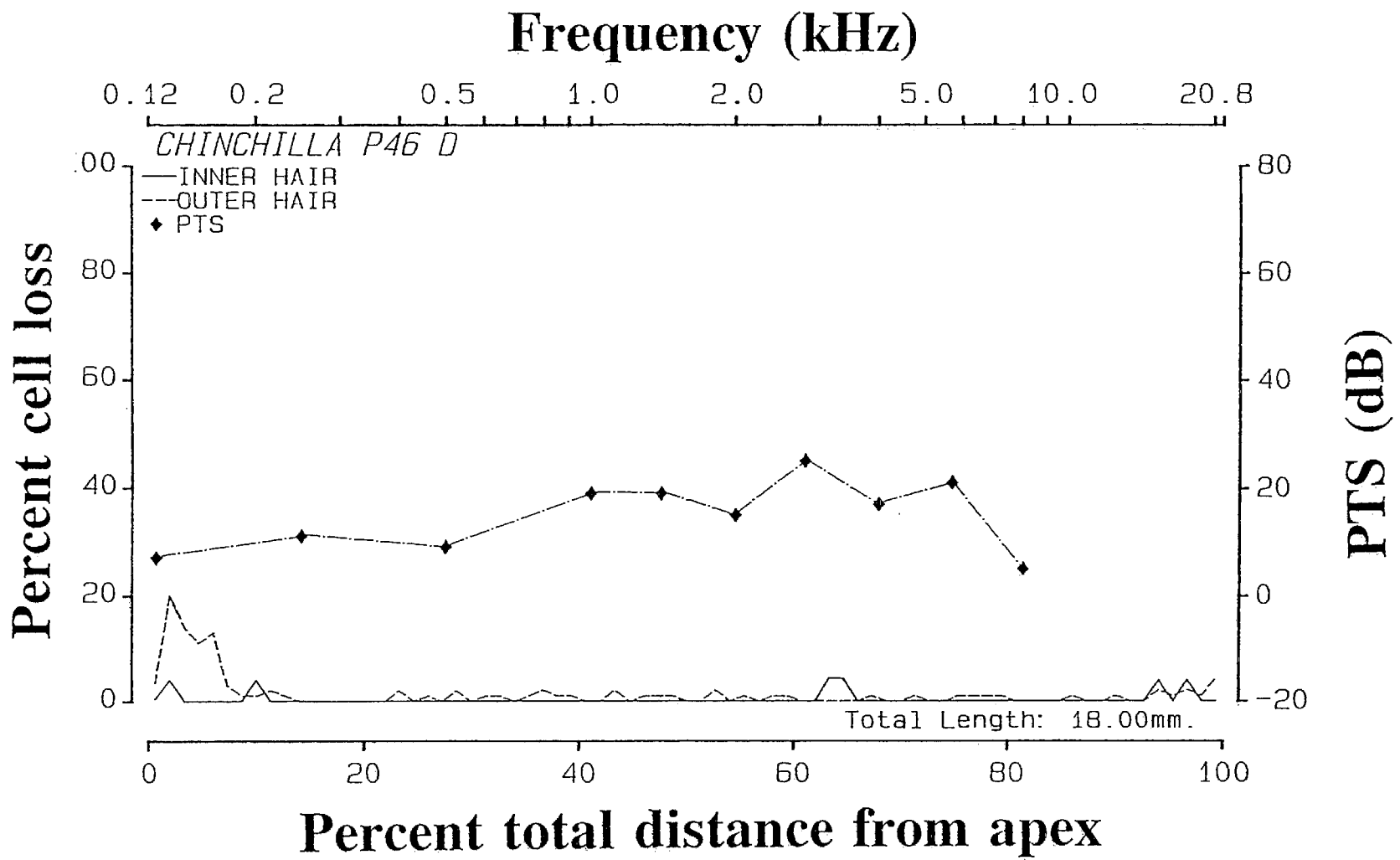
3550 Hz center frequency, 129 dB peak SPL

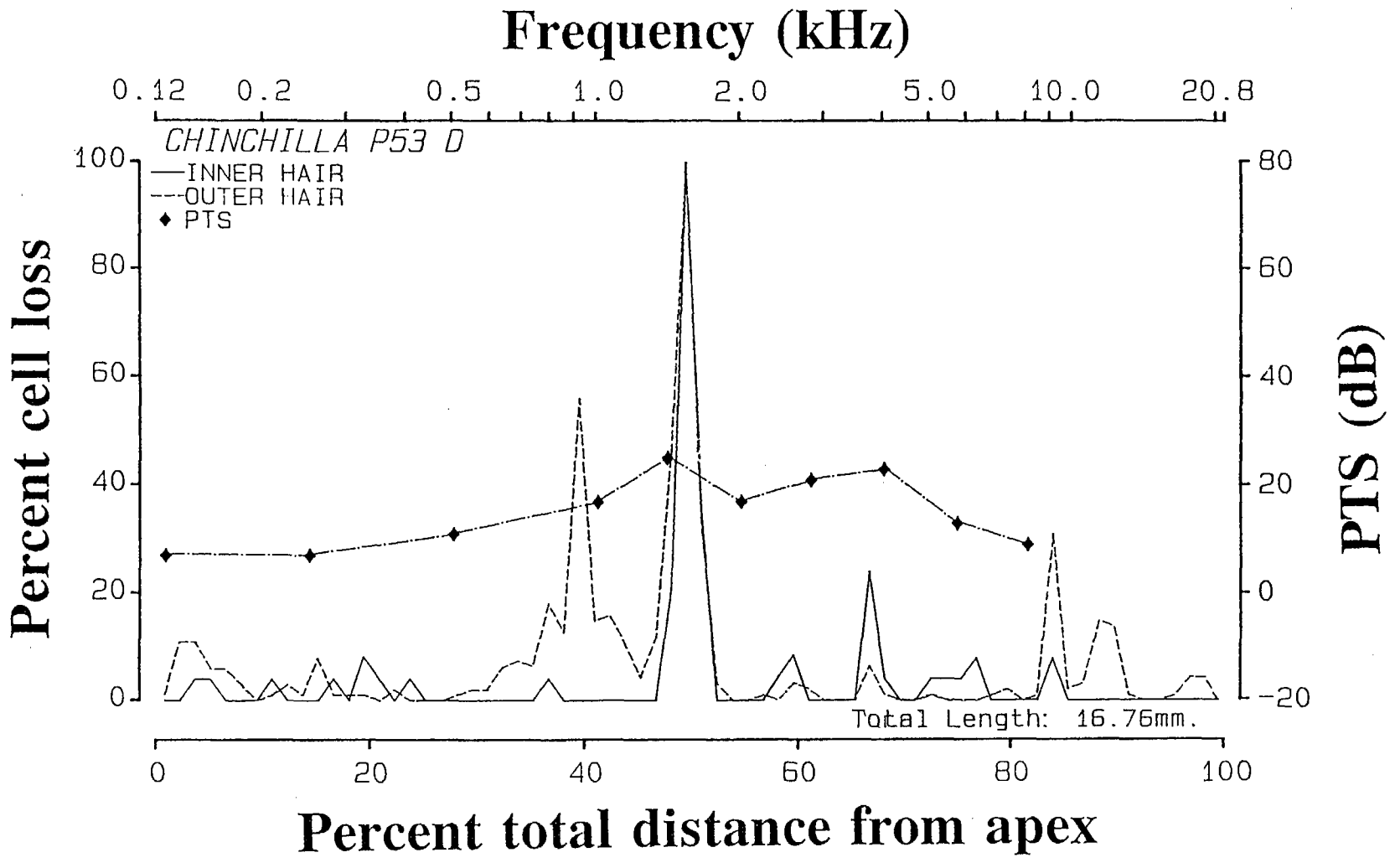
Total number of cochlear sensory cells missing

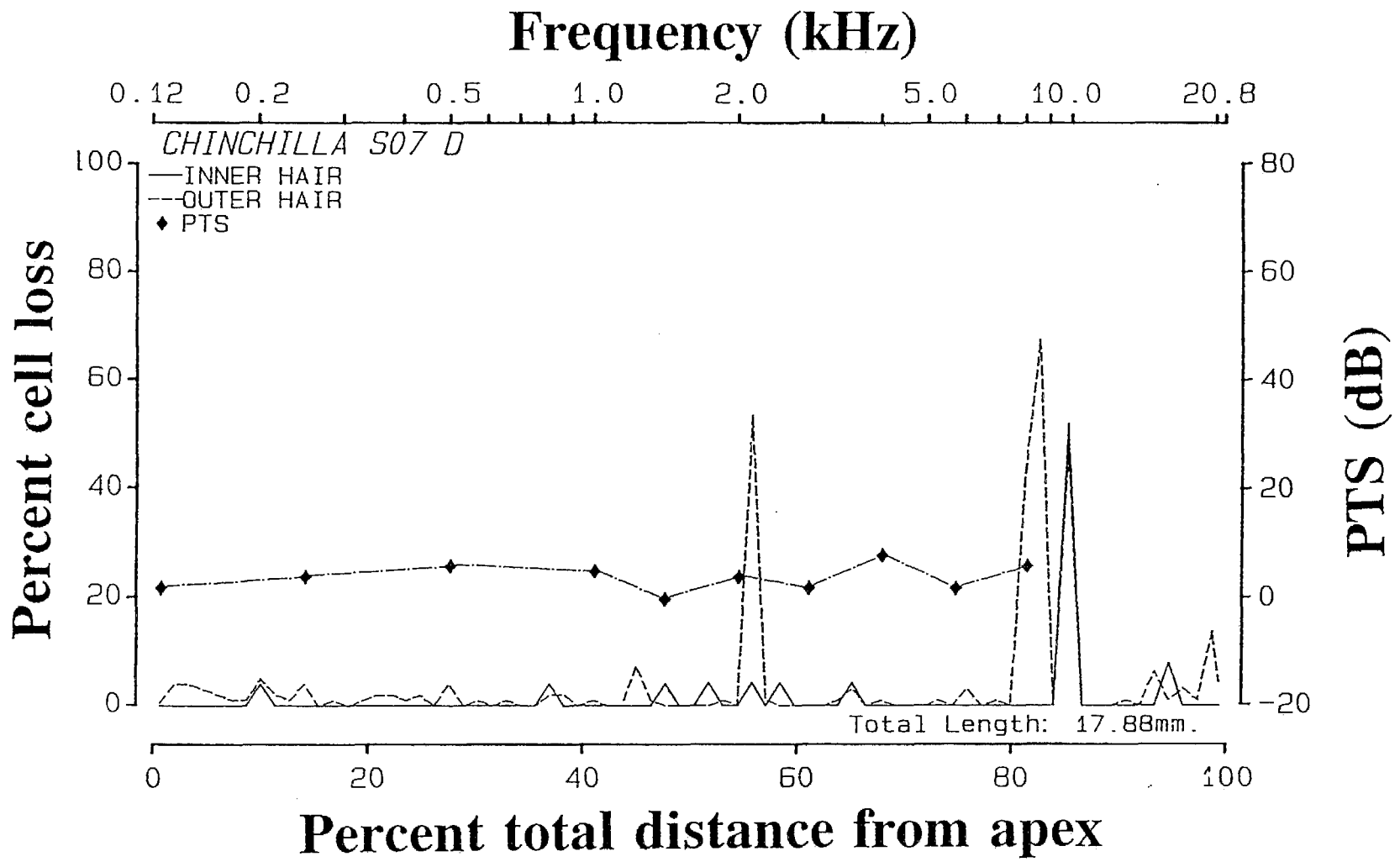
Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
P46	7	23	57	61	141
P53	62	104	142	238	484
S07	22	98	109	92	299
S08	78	651	667	571	1889
S11	8	33	34	58	125
S20	9	19	27	42	88
Group mean	31				504
S.D.	31				694
S.E.	13				283

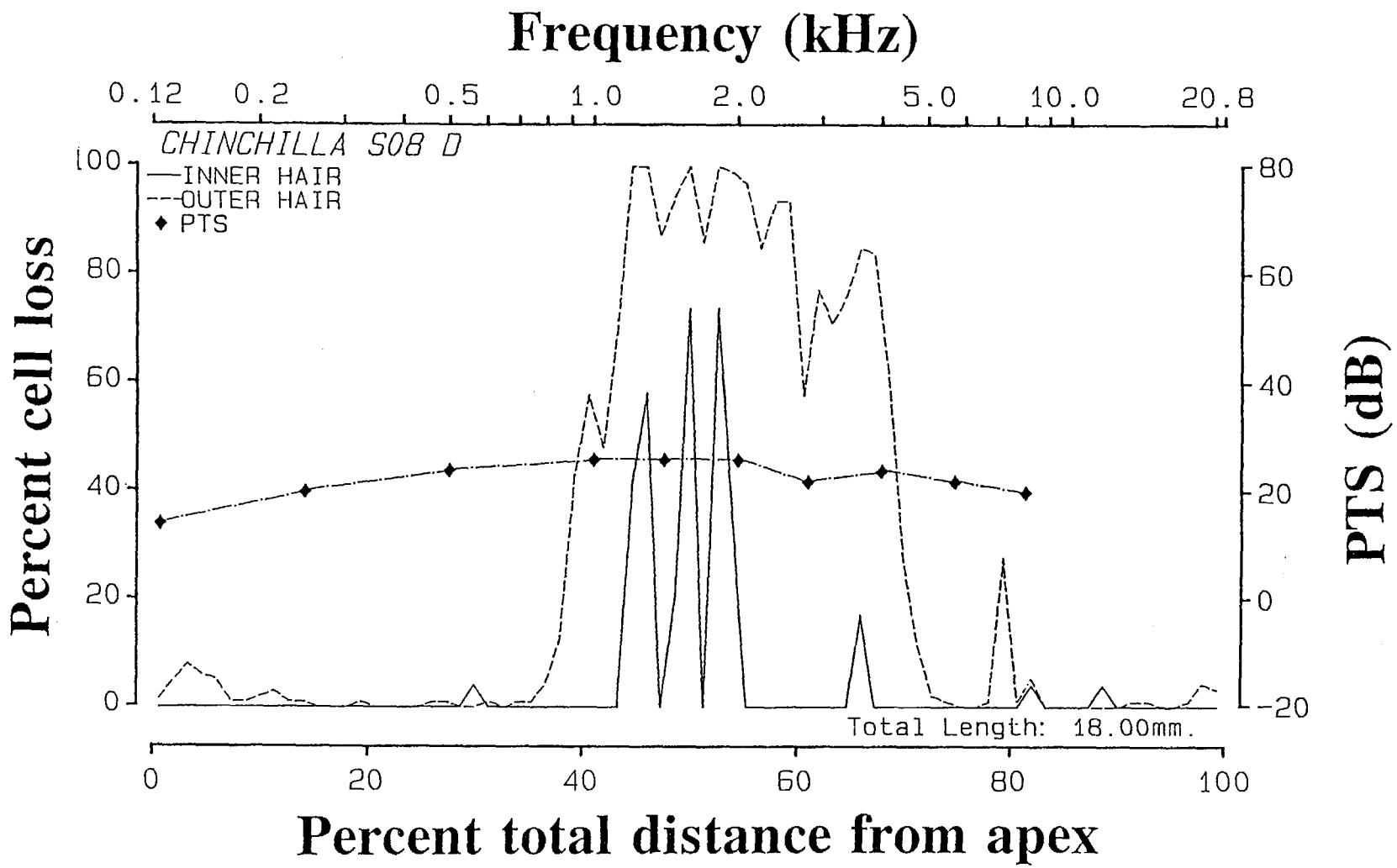
Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

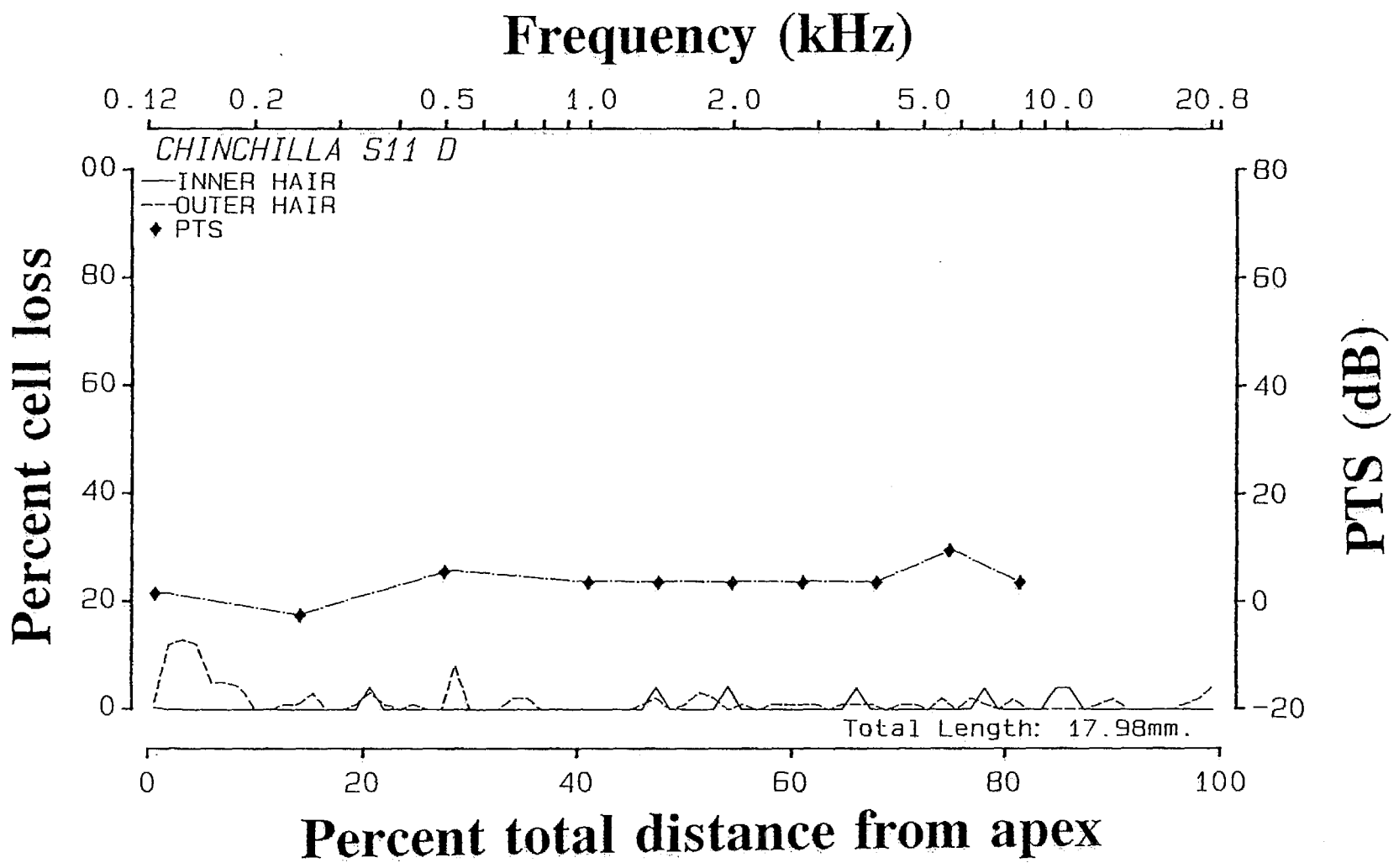
	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	1.3	47.5
	0.25 kHz	1.0	14.3
	0.5 kHz	1.0	10.0
	1 kHz	4.5	104.8
	2 kHz	15.2	184.8
	4 kHz	3.0	85.0
	8 kHz	4.0	40.7
	16 kHz	1.0	17.2
Standard deviations			
	0.125 kHz	1.2	27.8
	0.25 kHz	1.5	6.7
	0.5 kHz	0.9	6.0
	1 kHz	9.6	178.4
	2 kHz	21.8	338.1
	4 kHz	3.2	193.0
	8 kHz	4.7	56.4
	16 kHz	0.9	10.4

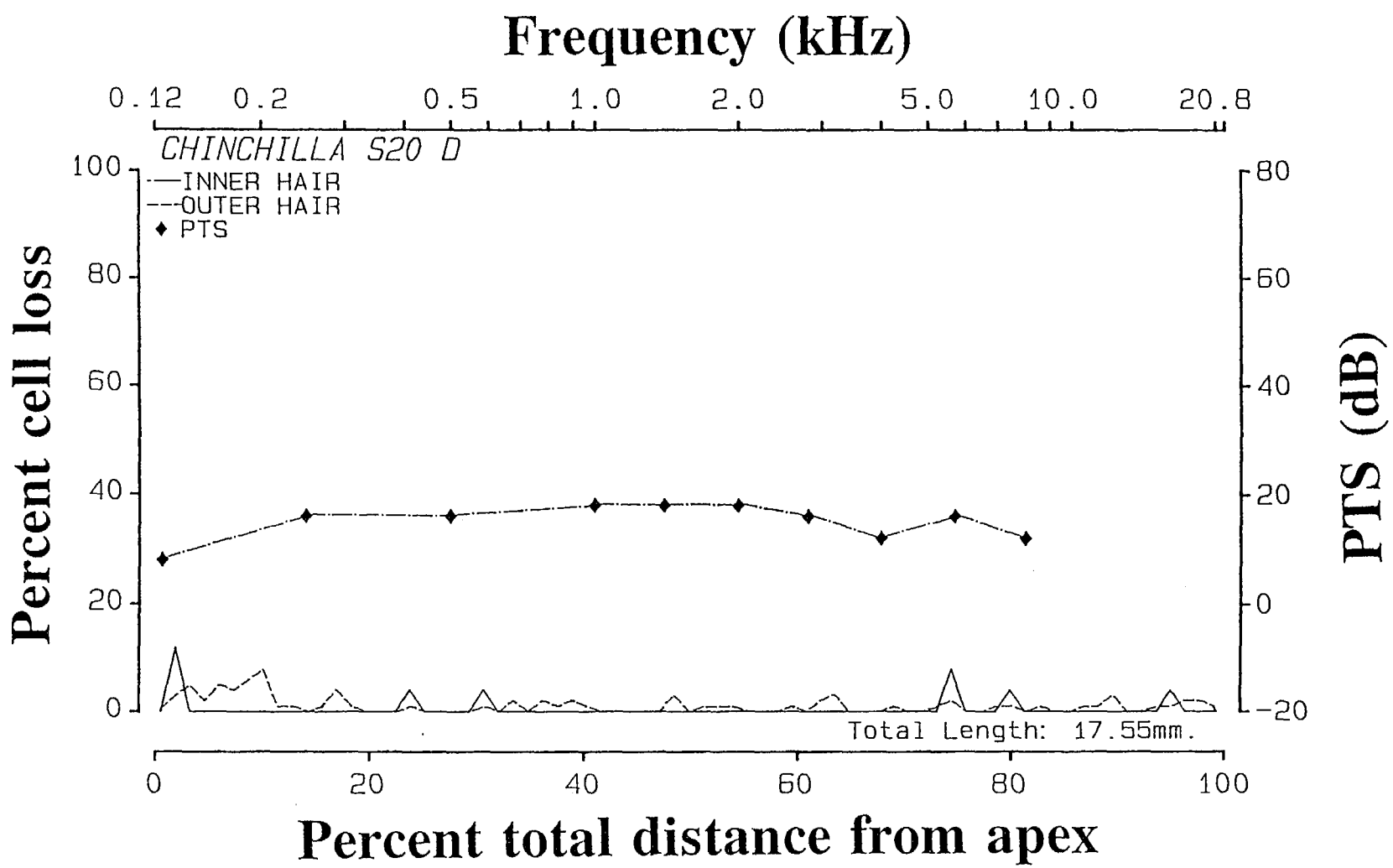

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P46 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.00mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P53 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 16.76mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S07 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.88mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S08 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.00mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S11 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
00
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.98mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S20 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.55mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

3550 Hz center frequency, 134 dB peak SPL

Animal #		
P15	-	Completed the entire protocol
P16	-	Completed the entire protocol
P25	-	Completed the entire protocol
P32	-	Completed the entire protocol
P40	-	Completed the entire protocol
P60	-	Completed the entire protocol

3550 Hz center frequency, 134 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P15	22.0	11.0	3.0	1.0	2.0	-2.0	4.0	0.0	9.0	6.0
P16	24.0	5.0	5.0	3.0	4.0	2.0	2.0	0.0	3.0	0.0
P25	24.0	3.0	5.0	3.0	2.0	2.0	0.0	0.0	7.0	2.0
P32	21.0	10.0	2.0	2.0	1.0	-5.0	1.0	1.0	0.0	5.0
P40	23.0	4.0	-2.0	2.0	1.0	-1.0	7.0	7.0	0.0	5.0
P60	24.0	11.0	-1.0	1.0	6.0	0.0	0.0	6.0	3.0	4.0
Mean	23.0	7.3	2.0	2.0	2.7	-0.7	2.3	2.3	3.7	3.7
S.D.	1.3	3.7	3.0	0.9	2.0	2.7	2.7	3.3	3.7	2.3

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P15	50.0	39.0	31.0	35.0	50.0	52.0	50.0	44.0	43.0	42.0
P16	60.0	55.0	49.0	47.0	48.0	48.0	52.0	42.0	45.0	52.0
P25	36.0	27.0	33.0	25.0	26.0	22.0	18.0	10.0	29.0	30.0
P32	28.6	19.6	3.6	17.6	22.6	26.6	32.6	22.6	17.6	16.6
P40	40.2	35.0	29.0	33.0	38.0	34.0	36.0	42.2	33.0	34.2
P60	38.6	31.6	27.6	29.6	36.6	32.6	34.6	32.6	27.6	28.6
Mean	42.2	34.5	28.9	31.2	36.9	35.9	37.2	32.2	32.5	33.9
S.D.	11.1	12.1	14.6	9.9	11.1	11.8	12.5	13.6	10.3	12.1

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
P15	28.0	28.0	28.0	34.0	48.0	54.0	46.0	44.0	34.0	36.0
P16	36.0	50.0	44.0	44.0	44.0	46.0	50.0	42.0	42.0	52.0
P25	12.0	24.0	28.0	22.0	24.0	20.0	18.0	10.0	22.0	28.0
P32	7.6	9.6	1.6	15.6	21.6	31.6	31.6	21.6	17.6	11.6
P40	17.2	31.0	31.0	31.0	37.0	35.0	29.0	35.2	33.0	29.2
P60	14.6	20.6	28.6	28.6	30.6	32.6	34.6	26.6	24.6	24.6
Mean	19.2	27.2	26.9	29.2	34.2	36.5	34.9	29.9	28.9	30.2
S.D.	10.7	13.4	13.8	9.8	10.7	11.9	11.7	13.0	9.0	13.4

Temporary Threshold Shift (dB): 3550 Hz center frequency, 134 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	47.0	72.0	72.0	67.0	59.0	46.0	45.0	33.0	31.0	29.0	26.0	24.0	32.0	30.0	28.0	72.0
P16	42.0	40.0	38.0	47.0	44.0	54.0	30.0	38.0	36.0	34.0	32.0	40.0	38.0	26.0	44.0	54.0
P25	32.0	40.0	38.0	26.0	14.0	12.0	0.0	18.0	16.0	14.0	12.0	10.0	18.0	16.0	4.0	40.0
P32	32.0	50.0	47.0	55.0	33.0	22.0	10.0	7.0	5.0	13.0	11.0	9.0	8.0	6.0	4.0	55.0
P40	30.0	24.0	35.0	40.0	35.0	33.0	23.0	22.0	21.0	20.0	19.0	23.0	12.0	1.0	31.0	40.0
P60	41.0	40.0	70.0	48.0	44.0	37.0	20.0	8.0	17.0	16.0	14.0	13.0	12.0	11.0	23.0	70.0
Mean	37.3	44.3	50.0	47.2	38.2	34.0	21.3	21.0	21.0	21.0	19.0	19.8	20.0	15.0	22.3	55.2
S.D.	6.9	15.9	16.8	13.8	15.0	15.4	15.6	12.7	11.1	8.6	8.4	11.8	12.2	11.3	15.8	13.9

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	59.0	84.0	75.0	73.0	61.0	38.0	27.0	25.0	23.0	31.0	28.0	26.0	24.0	32.0	30.0	84.0
P16	72.0	40.0	48.0	67.0	54.0	64.0	50.0	48.0	56.0	54.0	52.0	50.0	58.0	46.0	44.0	72.0
P25	44.0	52.0	60.0	48.0	26.0	24.0	12.0	30.0	18.0	16.0	24.0	22.0	30.0	28.0	16.0	60.0
P32	44.0	52.0	49.0	57.0	35.0	24.0	12.0	9.0	17.0	15.0	13.0	11.0	10.0	8.0	6.0	57.0
P40	40.0	54.0	45.0	50.0	45.0	43.0	43.0	42.0	41.0	30.0	9.0	43.0	32.0	31.0	40.0	54.0
P60	55.0	64.0	63.0	62.0	48.0	31.0	24.0	22.0	31.0	10.0	18.0	17.0	26.0	15.0	27.0	64.0
Mean	52.3	57.7	56.7	59.5	44.8	37.3	28.0	29.3	31.0	26.0	24.0	28.2	30.0	26.7	27.2	65.2
S.D.	12.1	15.0	11.5	9.7	12.7	15.1	15.7	14.1	15.2	16.1	15.4	15.2	15.8	13.5	14.3	11.1

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	51.0	79.0	87.0	85.0	63.0	50.0	29.0	27.0	25.0	33.0	30.0	28.0	26.0	24.0	32.0	87.0
P16	56.0	54.0	52.0	61.0	58.0	68.0	44.0	52.0	60.0	58.0	46.0	44.0	42.0	40.0	48.0	68.0
P25	46.0	54.0	62.0	50.0	28.0	16.0	14.0	22.0	10.0	28.0	26.0	24.0	32.0	20.0	38.0	62.0
P32	36.0	44.0	51.0	49.0	27.0	16.0	14.0	1.0	-1.0	7.0	-5.0	3.0	2.0	0.0	8.0	51.0
P40	40.0	54.0	45.0	40.0	35.0	33.0	43.0	22.0	31.0	30.0	29.0	33.0	32.0	31.0	30.0	54.0
P60	71.0	70.0	100.0	88.0	54.0	47.0	30.0	18.0	37.0	26.0	34.0	33.0	32.0	21.0	23.0	100.0
Mean	50.0	59.2	66.2	62.2	44.2	38.3	29.0	23.7	27.0	30.3	26.7	27.5	27.7	22.7	29.8	70.3
S.D.	12.6	12.8	22.3	20.0	16.0	20.6	13.2	16.5	21.4	16.4	17.0	13.8	13.6	13.4	13.6	19.4

Temporary Threshold Shift (dB): 3550 Hz center frequency, 134 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	85.0	93.0	91.0	89.0	77.0	64.0	53.0	41.0	39.0	37.0	34.0	32.0	30.0	38.0	36.0	93.0
P16	70.0	58.0	76.0	85.0	72.0	72.0	58.0	56.0	54.0	62.0	50.0	48.0	36.0	44.0	42.0	85.0
P25	70.0	68.0	66.0	64.0	42.0	30.0	28.0	26.0	14.0	22.0	20.0	28.0	26.0	14.0	22.0	70.0
P32	68.0	56.0	53.0	51.0	39.0	28.0	16.0	23.0	21.0	19.0	17.0	25.0	14.0	12.0	10.0	68.0
P40	48.0	50.0	53.0	68.0	63.0	42.0	51.0	40.0	39.0	28.0	27.0	31.0	30.0	29.0	38.0	68.0
P60	71.0	80.0	79.0	78.0	54.0	37.0	40.0	38.0	37.0	26.0	34.0	23.0	32.0	21.0	33.0	80.0
Mean	68.7	67.5	69.7	72.5	57.8	45.5	41.0	37.3	34.0	32.3	30.3	31.2	28.0	26.3	30.2	77.3
S.D.	11.9	16.3	15.2	14.2	15.6	18.3	16.3	11.9	14.3	15.8	11.9	8.9	7.6	13.0	12.0	10.4

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	73.0	98.0	89.0	98.0	75.0	62.0	61.0	59.0	57.0	45.0	52.0	50.0	48.0	46.0	44.0	98.0
P16	68.0	66.0	74.0	83.0	70.0	70.0	56.0	54.0	52.0	70.0	58.0	46.0	34.0	42.0	40.0	83.0
P25	70.0	68.0	66.0	64.0	42.0	30.0	28.0	26.0	24.0	22.0	20.0	28.0	26.0	24.0	22.0	70.0
P32	68.0	66.0	73.0	81.0	49.0	38.0	16.0	23.0	31.0	19.0	17.0	25.0	24.0	22.0	20.0	81.0
P40	68.0	70.0	73.0	58.0	63.0	42.0	31.0	40.0	59.0	28.0	37.0	31.0	30.0	39.0	48.0	73.0
P60	45.0	64.0	63.0	72.0	48.0	31.0	24.0	42.0	21.0	30.0	38.0	37.0	26.0	25.0	27.0	72.0
Mean	65.3	72.0	73.0	76.0	57.8	45.5	36.0	40.7	40.7	35.7	37.0	36.2	31.3	33.0	33.5	79.5
S.D.	10.1	12.9	9.0	14.4	13.4	16.7	18.2	14.4	17.3	19.1	16.5	10.1	8.9	10.5	12.0	10.4

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	69.0	102.0	83.0	97.0	79.0	66.0	55.0	53.0	61.0	59.0	56.0	54.0	52.0	50.0	58.0	102.0
P16	80.0	68.0	86.0	82.0	72.0	72.0	58.0	56.0	54.0	72.0	50.0	48.0	46.0	44.0	42.0	86.0
P25	70.0	68.0	66.0	64.0	42.0	30.0	18.0	26.0	24.0	32.0	10.0	28.0	16.0	24.0	22.0	70.0
P32	74.0	82.0	79.0	77.0	55.0	54.0	42.0	39.0	37.0	25.0	33.0	31.0	30.0	38.0	26.0	82.0
P40	90.0	44.0	65.0	70.0	45.0	53.0	33.0	42.0	31.0	50.0	29.0	43.0	32.0	31.0	40.0	90.0
P60	72.0	70.0	79.0	78.0	34.0	37.0	30.0	28.0	37.0	36.0	34.0	33.0	32.0	21.0	43.0	79.0
Mean	75.8	72.3	76.3	78.0	54.5	52.0	39.3	40.7	40.7	45.7	35.3	39.5	34.7	34.7	38.5	84.8
S.D.	8.0	19.1	8.8	11.3	17.7	16.2	15.4	12.4	14.1	17.9	16.3	10.4	12.8	11.4	13.0	10.8

Temporary Threshold Shift (dB): 3550 Hz center frequency, 134 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	96.0	89.0	77.0	75.0	73.0	60.0	49.0	47.0	55.0	53.0	50.0	48.0	46.0	44.0	42.0	96.0
P16	80.0	68.0	86.0	85.0	72.0	72.0	58.0	56.0	64.0	72.0	60.0	48.0	56.0	44.0	42.0	86.0
P25	72.0	70.0	68.0	66.0	44.0	32.0	10.0	18.0	16.0	24.0	22.0	20.0	18.0	16.0	14.0	72.0
P32	68.0	76.0	63.0	71.0	49.0	28.0	36.0	33.0	32.0	29.0	37.0	25.0	34.0	32.0	30.0	76.0
P40	32.0	46.0	67.0	62.0	47.0	45.0	35.0	44.0	43.0	22.0	31.0	25.0	24.0	23.0	42.0	67.0
P60	71.0	80.0	79.0	78.0	44.0	37.0	30.0	28.0	37.0	26.0	34.0	43.0	22.0	41.0	33.0	80.0
Mean	69.8	71.5	73.3	72.8	54.8	45.7	36.3	37.7	41.2	37.7	39.0	34.8	33.3	33.3	33.8	79.5
S.D.	21.1	14.6	8.7	8.3	13.8	17.2	16.5	13.9	17.0	20.3	13.7	12.9	15.0	11.8	11.0	10.4

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	75.0	100.0	81.0	89.0	67.0	54.0	53.0	51.0	39.0	37.0	44.0	42.0	40.0	48.0	46.0	100.0
P16	72.0	60.0	78.0	67.0	64.0	64.0	50.0	58.0	46.0	74.0	42.0	40.0	48.0	36.0	44.0	78.0
P25	52.0	60.0	58.0	56.0	44.0	12.0	10.0	18.0	26.0	14.0	12.0	10.0	18.0	6.0	4.0	60.0
P32	58.0	66.0	63.0	61.0	49.0	38.0	26.0	23.0	21.0	19.0	17.0	15.0	24.0	22.0	30.0	66.0
P40	48.0	62.0	73.0	78.0	33.0	41.0	31.0	40.0	29.0	38.0	37.0	31.0	40.0	39.0	29.0	78.0
P60	65.0	54.0	63.0	72.0	28.0	21.0	24.0	22.0	31.0	10.0	28.0	27.0	26.0	25.0	27.0	72.0
Mean	61.7	67.0	69.3	70.5	47.5	38.3	32.3	35.3	32.0	32.0	30.0	27.5	32.7	29.3	30.0	75.7
S.D.	10.9	16.6	9.3	11.9	15.9	19.5	16.4	16.8	9.1	23.7	13.3	13.0	11.6	14.9	15.1	13.8

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	90.0	90.0	71.0	69.0	47.0	54.0	43.0	41.0	39.0	37.0	44.0	32.0	30.0	28.0	36.0	90.0
P16	68.0	66.0	84.0	83.0	60.0	60.0	46.0	54.0	62.0	70.0	38.0	46.0	54.0	32.0	40.0	84.0
P25	44.0	52.0	50.0	58.0	46.0	34.0	32.0	30.0	8.0	26.0	24.0	22.0	20.0	18.0	26.0	58.0
P32	48.0	56.0	73.0	81.0	39.0	38.0	26.0	33.0	31.0	9.0	17.0	15.0	14.0	22.0	20.0	81.0
P40	38.0	62.0	73.0	68.0	53.0	51.0	41.0	40.0	39.0	48.0	27.0	31.0	40.0	29.0	38.0	73.0
P60	67.0	66.0	55.0	84.0	40.0	24.0	26.0	34.0	33.0	12.0	30.0	29.0	18.0	27.0	19.0	84.0
Mean	59.2	65.3	67.7	73.8	47.5	43.5	35.7	38.7	35.3	33.7	30.0	29.2	29.3	26.0	29.8	78.3
S.D.	19.5	13.3	12.7	10.5	8.0	13.7	8.8	8.6	17.4	23.1	9.7	10.5	15.3	5.1	9.4	11.4

Temporary Threshold Shift (dB): 3550 Hz center frequency, 134 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
P15	88.0	88.0	69.0	67.0	55.0	52.0	41.0	49.0	47.0	35.0	32.0	40.0	38.0	36.0	34.0	88.0
P16	66.0	64.0	82.0	71.0	68.0	68.0	54.0	62.0	60.0	78.0	56.0	54.0	62.0	40.0	48.0	82.0
P25	64.0	62.0	60.0	58.0	36.0	34.0	32.0	30.0	18.0	36.0	24.0	32.0	30.0	28.0	26.0	64.0
P32	48.0	56.0	63.0	61.0	29.0	38.0	26.0	23.0	21.0	19.0	17.0	5.0	14.0	12.0	10.0	63.0
P40	48.0	52.0	65.0	68.0	23.0	51.0	41.0	20.0	29.0	8.0	37.0	31.0	40.0	19.0	19.0	68.0
P60	51.0	50.0	49.0	58.0	24.0	17.0	20.0	18.0	17.0	6.0	24.0	23.0	22.0	21.0	33.0	58.0
Mean	60.8	62.0	64.7	63.8	39.2	43.3	35.7	33.7	32.0	30.3	31.7	30.8	34.3	26.0	28.3	70.5
S.D.	15.5	13.9	10.9	5.6	18.4	17.6	12.2	17.9	17.7	26.6	13.8	16.4	16.7	10.7	13.2	11.8

3550 Hz center frequency, 134 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
P15	35	1360	1295	1239	3894
P16	370	1252	1350	1161	3763
P25	301	731	693	641	2065
P32	14	409	427	589	1425
P40	91	527	477	519	1523
P60	31	690	665	716	2071
Group mean	140				2457
S.D.	155				1096
S.E.	63				448

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	4.2	86.7
	0.25 kHz	1.3	127.0
	0.5 kHz	6.7	57.2
	1 kHz	38.2	420.5
	2 kHz	64.2	619.7
	4 kHz	13.8	562.3
	8 kHz	9.7	526.0
	16 kHz	2.3	57.5
Standard deviations			
	0.125 kHz	3.5	34.4
	0.25 kHz	2.0	149.4
	0.5 kHz	12.5	67.5
	1 kHz	46.7	220.7
	2 kHz	88.2	284.2
	4 kHz	15.0	330.4
	8 kHz	19.3	268.0
	16 kHz	1.9	97.9

3550 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla P15D							
0.125 kHz	7	71	47	29	147	2	2
0.25 kHz	1	178	137	90	405	0	1
0.5 kHz	2	58	28	26	112	0	1
1 kHz	10	200	236	179	615	15	44
2 kHz	6	306	301	303	910	7	40
4 kHz	5	307	304	302	913	3	21
8 kHz	2	228	234	277	739	10	31
16 kHz	2	12	8	33	53	0	0
TOTALS	35	1360	1295	1239	3894	37	140
Chinchilla P16D							
0.125 kHz	2	10	35	38	83	2	1
0.25 kHz	0	11	10	44	65	0	1
0.5 kHz	0	76	73	20	169	0	0
1 kHz	85	187	256	142	585	180	114
2 kHz	230	308	308	308	924	496	308
4 kHz	44	304	305	279	888	110	73
8 kHz	4	261	277	257	795	3	2
16 kHz	5	95	86	73	254	1	0
TOTALS	370	1252	1350	1161	3763	792	499
Chinchilla P25D							
0.125 kHz	2	13	18	12	43	1	0
0.25 kHz	5	8	7	7	22	0	0
0.5 kHz	32	14	9	8	31	2	4
1 kHz	109	267	211	146	624	2	6
2 kHz	92	128	125	120	373	4	1
4 kHz	12	54	64	83	201	0	4
8 kHz	49	243	253	259	755	113	135
16 kHz	0	4	6	6	16	0	0
TOTALS	301	731	693	641	2065	122	150

3550 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla P32D							
0.125 kHz	3	11	26	32	69	0	3
0.25 kHz	0	25	1	33	59	0	0
0.5 kHz	0	4	0	7	11	0	0
1 kHz	2	22	21	45	88	0	0
2 kHz	1	46	67	110	223	5	13
4 kHz	5	209	214	242	665	6	24
8 kHz	2	91	97	119	307	5	16
16 kHz	1	1	1	1	3	1	0
TOTALS	14	409	427	589	1425	17	56
Chinchilla P40D							
0.125 kHz	10	21	21	44	86	2	1
0.25 kHz	2	7	3	12	22	1	0
0.5 kHz	1	5	1	0	6	0	1
1 kHz	21	113	111	71	295	34	18
2 kHz	46	242	178	162	582	85	49
4 kHz	8	23	34	86	143	1	0
8 kHz	1	109	128	143	380	0	4
16 kHz	2	7	1	1	9	0	0
TOTALS	91	527	477	519	1523	123	73
Chinchilla P60D							
0.125 kHz	1	29	22	41	92	0	3
0.25 kHz	0	52	64	73	189	0	0
0.5 kHz	5	1	2	11	14	0	0
1 kHz	2	114	103	99	316	4	13
2 kHz	10	253	231	222	706	29	42
4 kHz	9	185	181	198	564	12	50
8 kHz	0	52	61	67	180	5	10
16 kHz	4	4	1	5	10	0	0
TOTALS	31	690	665	716	2071	50	118

3550 Hz center frequency, 134 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	4.2	25.8	28.2	32.7	86.7	1.2	1.7
0.25 kHz	1.3	46.8	37.0	43.2	127.0	0.2	0.3
0.5 kHz	6.7	26.3	18.8	12.0	57.2	0.3	1.0
1 kHz	38.2	150.5	156.3	113.7	420.5	39.2	32.5
2 kHz	64.2	213.8	201.7	204.2	619.7	104.3	75.5
4 kHz	13.8	180.3	183.7	198.3	562.3	22.0	28.7
8 kHz	9.7	164.0	175.0	187.0	526.0	22.7	33.0
16 kHz	2.3	20.5	17.2	19.8	57.5	0.3	0.0
TOTALS	140.3	828.2	817.8	810.8	2456.8	190.2	172.7
Group standard deviations							
0.125 kHz	3.5	23.3	10.9	11.6	34.4	1.0	1.2
0.25 kHz	2.0	66.5	54.4	33.1	149.4	0.4	0.5
0.5 kHz	12.5	32.3	28.5	9.4	67.5	0.8	1.5
1 kHz	46.7	85.6	92.2	50.7	220.7	70.1	42.7
2 kHz	88.2	105.1	96.5	87.9	284.2	194.3	115.4
4 kHz	15.0	120.7	115.6	95.0	330.4	43.3	28.0
8 kHz	19.3	90.2	90.8	88.5	268.0	44.4	51.0
16 kHz	1.9	36.7	33.9	28.7	97.9	0.5	0.0
TOTALS	154.9	389.2	404.7	309.2	1096.4	298.1	164.1

3550 Hz center frequency, 134 dB peak SPL

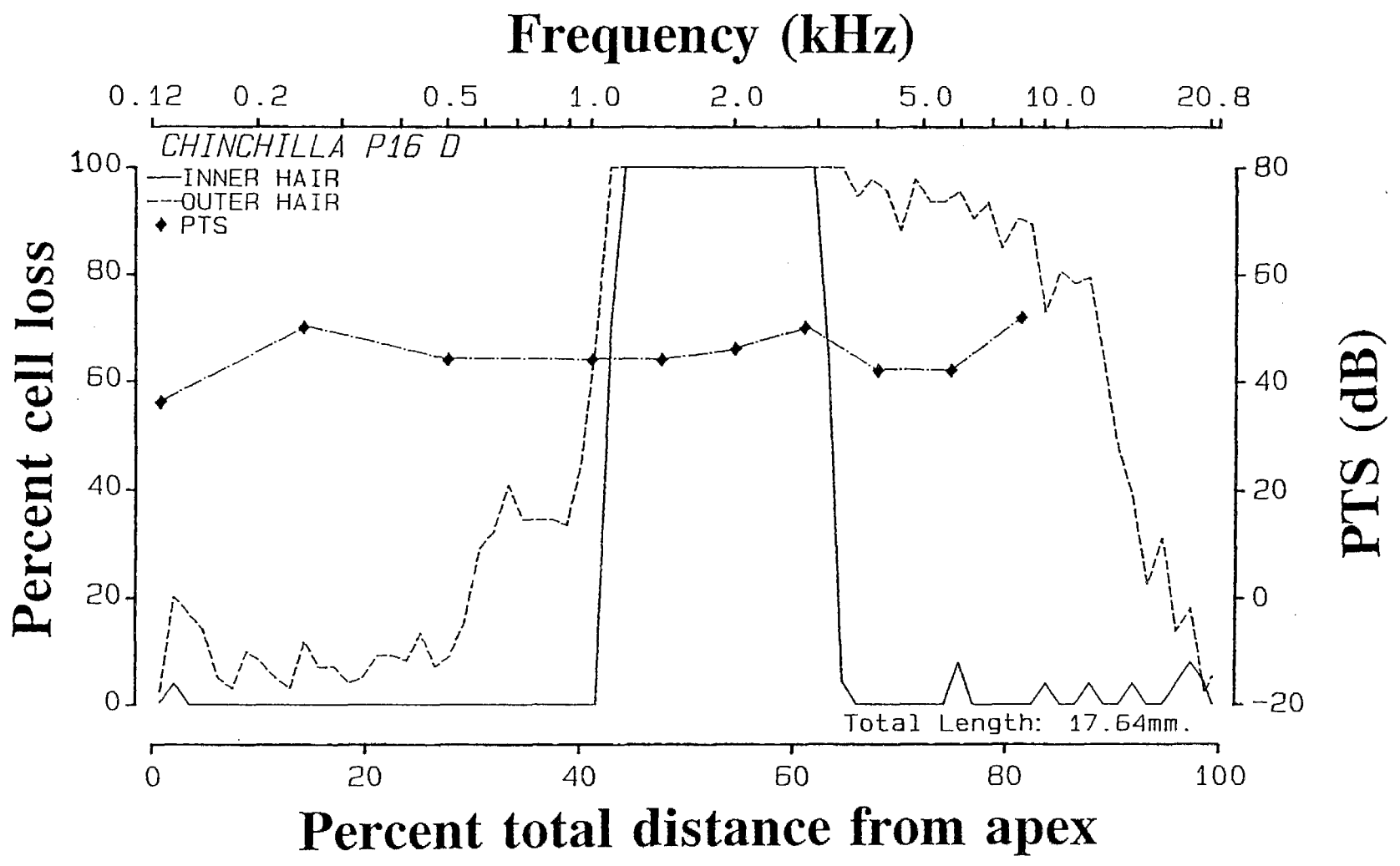
Percent sensory cell losses over octave band frequencies

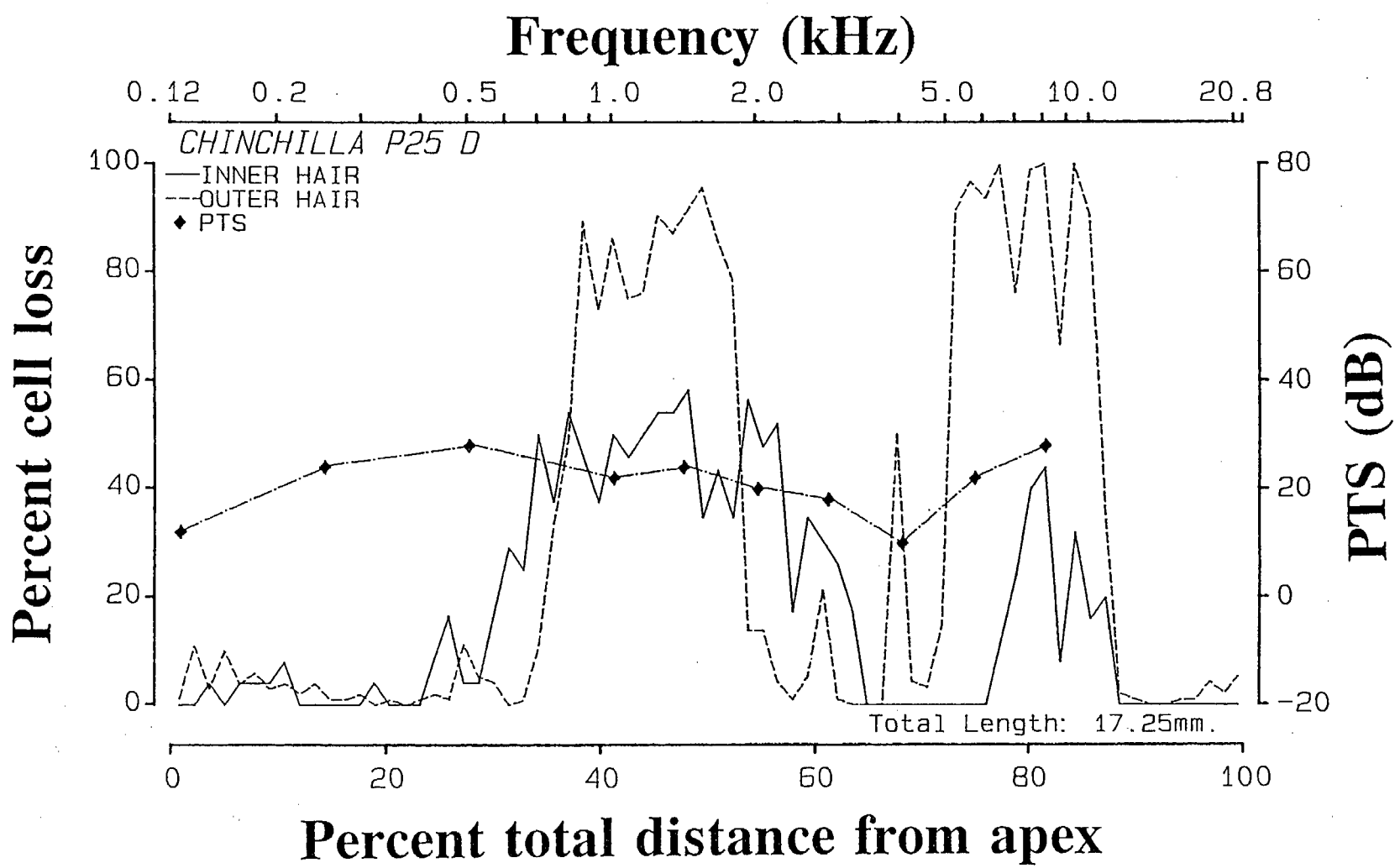
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla P15D							
0.125 kHz	5.1	39.2	25.9	16.0	27.0	0.7	1.1
0.25 kHz	0.4	56.1	43.2	28.3	42.5	0.0	0.3
0.5 kHz	0.8	18.4	8.8	8.2	11.8	0.0	0.3
1 kHz	4.2	66.2	78.1	59.2	67.8	3.0	14.5
2 kHz	2.6	99.3	97.7	98.3	98.4	1.4	12.9
4 kHz	2.0	100.0	99.0	98.3	99.1	0.6	6.8
8 kHz	0.8	74.0	75.9	89.9	79.9	2.0	10.0
16 kHz	0.8	4.1	2.7	11.3	6.0	0.0	0.0
Chinchilla P16D							
0.125 kHz	1.4	5.5	19.3	20.9	15.2	0.7	0.5
0.25 kHz	0.0	3.4	3.1	13.9	6.8	0.0	0.3
0.5 kHz	0.0	24.0	23.1	6.3	17.8	0.0	0.0
1 kHz	36.4	62.1	85.0	47.1	64.7	37.0	37.8
2 kHz	100.4	100.0	100.0	100.0	100.0	100.0	100.0
4 kHz	18.1	99.0	99.3	90.8	96.4	22.1	23.7
8 kHz	1.6	84.7	89.9	83.4	86.0	0.6	0.6
16 kHz	2.1	32.6	29.5	25.0	29.0	0.2	0.0
Chinchilla P25D							
0.125 kHz	1.4	7.3	10.1	6.7	8.0	0.3	0.0
0.25 kHz	2.1	2.5	2.2	2.2	2.3	0.0	0.0
0.5 kHz	13.7	4.5	2.9	2.5	3.3	0.4	1.2
1 kHz	47.8	90.8	71.7	49.6	70.7	0.4	2.0
2 kHz	41.0	42.5	41.5	39.8	41.3	0.8	0.3
4 kHz	5.0	17.9	21.2	27.5	22.2	0.0	1.3
8 kHz	20.1	80.7	84.0	86.0	83.6	23.2	44.8
16 kHz	0.0	1.4	2.1	2.1	1.9	0.0	0.0

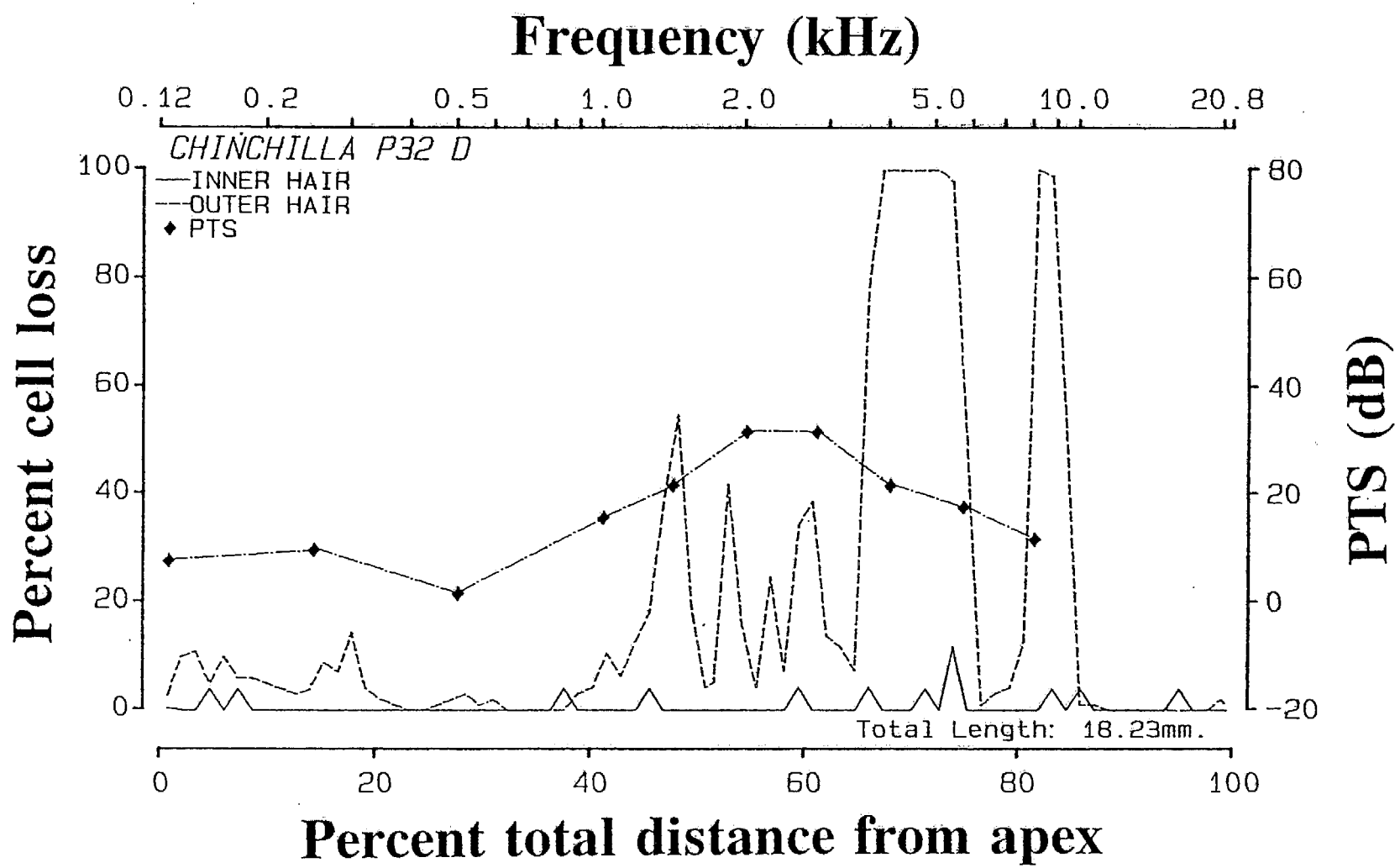
3550 Hz center frequency, 134 dB peak SPL

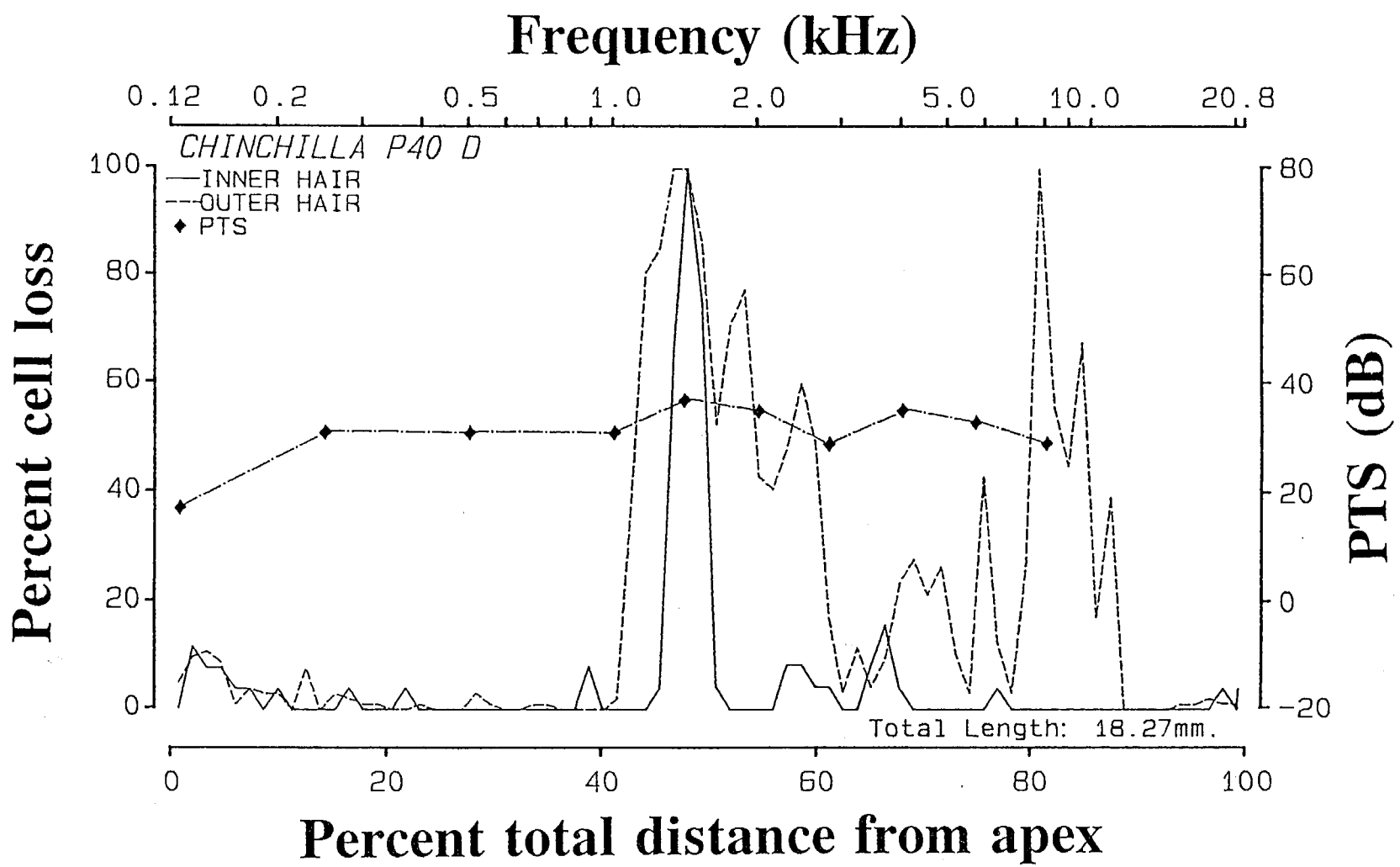
Percent sensory cell losses over octave band frequencies

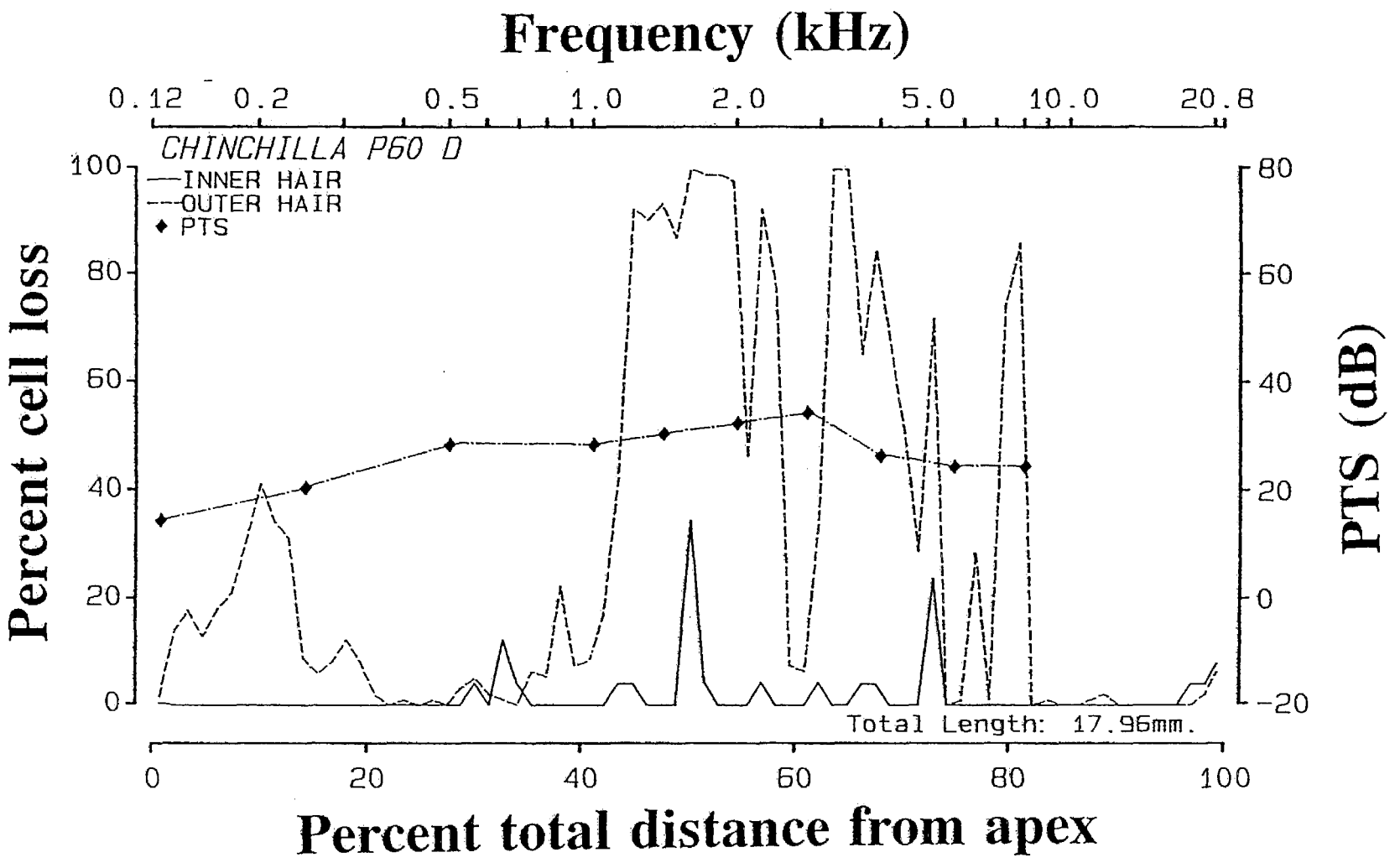
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla P32D							
0.125 kHz	2.1	5.8	13.9	17.1	12.3	0.0	1.6
0.25 kHz	0.0	7.6	0.3	10.0	6.0	0.0	0.0
0.5 kHz	0.0	1.2	0.0	2.1	1.1	0.0	0.0
1 kHz	0.8	7.0	6.7	14.4	9.4	0.0	0.0
2 kHz	0.4	13.8	20.2	33.2	22.4	0.9	3.9
4 kHz	1.9	65.7	67.2	76.1	69.7	1.1	7.5
8 kHz	0.7	28.6	30.5	37.4	32.2	0.9	5.0
16 kHz	0.4	0.3	0.3	0.3	0.3	0.2	0.0
Chinchilla P40D							
0.125 kHz	7.0	11.2	11.2	23.5	15.3	0.7	0.5
0.25 kHz	0.8	2.1	0.9	3.6	2.2	0.1	0.0
0.5 kHz	0.4	1.5	0.3	0.0	0.6	0.0	0.3
1 kHz	8.7	36.2	35.5	22.7	31.5	6.7	5.7
2 kHz	19.4	76.1	55.9	50.9	61.0	16.5	15.4
4 kHz	3.1	7.2	10.6	26.9	14.9	0.1	0.0
8 kHz	0.3	34.1	40.1	44.8	39.7	0.0	1.2
16 kHz	0.7	2.2	0.3	0.3	0.9	0.0	0.0
Chinchilla P60D							
0.125 kHz	0.7	15.7	11.9	22.2	16.6	0.0	1.6
0.25 kHz	0.0	16.1	19.8	22.6	19.5	0.0	0.0
0.5 kHz	2.0	0.3	0.6	3.4	1.4	0.0	0.0
1 kHz	0.8	37.1	33.5	32.2	34.3	0.8	4.2
2 kHz	4.3	80.8	73.8	70.9	75.2	5.7	13.4
4 kHz	3.6	59.1	57.8	63.2	60.0	2.3	15.9
8 kHz	0.0	16.6	19.4	21.4	19.1	0.9	3.1
16 kHz	1.7	1.3	0.3	1.7	1.1	0.0	0.0


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P16 D
—INNER HAIR
---OUTER HAIR
♦ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.64mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P25 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.25mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P32 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.23mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P40 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.27mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA P60 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 17.96mm.
0
20
40
60
80
100
Percent total distance from apex

Summary data for the group exposed to:

3550 Hz center frequency, 139 dB peak SPL

Animal #		
S44	-	Completed the entire protocol
S54	-	Completed the entire protocol
S59	-	Completed the entire protocol
S67	-	Completed the entire protocol
S79	-	Completed the entire protocol
S83	-	Completed the entire protocol

3550 Hz center frequency, 139 dB peak SPL

Preexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S44	18.0	13.0	3.0	3.0	4.0	2.0	6.0	2.0	5.0	14.0
S54	25.0	4.0	4.0	4.0	1.0	1.0	3.0	3.0	4.0	1.0
S59	24.0	9.0	3.0	3.0	0.0	4.0	2.0	6.0	-1.0	4.0
S67	21.0	6.0	0.0	-2.0	-1.0	3.0	1.0	5.0	6.0	3.0
S79	24.0	3.0	5.0	1.0	2.0	0.0	0.0	0.0	3.0	0.0
S83	25.0	12.0	2.0	-1.0	-1.0	-1.0	1.0	3.0	0.0	7.0
Mean	22.8	7.8	2.8	1.3	0.8	1.5	2.2	3.2	2.8	4.8
S.D.	2.8	4.2	1.7	2.4	1.9	1.9	2.1	2.1	2.8	5.1

Postexposure thresholds (dB SPL)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S44	67.0	52.0	44.0	64.0	67.0	61.0	63.0	59.0	58.0	57.0
S54	40.8	33.8	27.8	33.6	34.8	42.8	42.8	42.8	43.8	40.8
S59	39.8	28.8	29.0	37.0	40.0	54.0	50.0	46.0	41.0	48.0
S67	40.0	49.0	33.0	53.0	56.0	50.0	58.0	50.0	55.0	54.0
S79	34.6	29.6	31.6	43.6	38.6	48.6	52.6	42.6	47.6	48.6
S83	38.0	40.8	31.0	33.0	42.0	32.0	44.0	38.0	45.0	40.0
Mean	43.4	39.0	32.7	44.0	46.4	48.1	51.7	46.4	48.4	48.1
S.D.	11.8	9.9	5.8	12.3	12.4	9.9	7.9	7.3	6.7	6.8

Permanent threshold shift (dB)

Animal\kHz	0.1	0.2	0.5	1.0	1.4	2.0	2.8	4.0	5.7	8.0
S44	49.0	39.0	41.0	61.0	63.0	59.0	57.0	57.0	53.0	43.0
S54	15.8	29.8	23.8	29.6	33.8	41.8	39.8	39.8	39.8	39.8
S59	15.8	19.8	26.0	34.0	40.0	50.0	48.0	40.0	42.0	44.0
S67	19.0	43.0	33.0	55.0	57.0	47.0	57.0	45.0	49.0	51.0
S79	10.6	26.6	26.6	42.6	36.6	48.6	52.6	42.6	44.6	48.6
S83	13.0	28.8	29.0	34.0	43.0	33.0	43.0	35.0	45.0	33.0
Mean	20.5	31.2	29.9	42.7	45.6	46.6	49.6	43.2	45.6	43.2
S.D.	14.2	8.5	6.3	12.7	11.8	8.7	7.2	7.5	4.8	6.4

Temporary Threshold Shift (dB): 3550 Hz center frequency, 139 dB peak SPL

Frequency 0.125 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	41.0	30.0	29.0	38.0	47.0	65.0	44.0	44.0	43.0	62.0	41.0	40.0	69.0	58.0	37.0	69.0
S54	46.0	64.0	61.0	59.0	57.0	55.0	53.0	41.0	39.0	17.0	25.0	24.0	12.0	20.0	-2.0	64.0
S59	30.0	59.0	48.0	57.0	50.0	51.0	30.0	19.0	18.0	13.0	22.0	10.0	10.0	19.0	18.0	59.0
S67	28.0	28.0	18.0	38.0	18.0	38.0	37.0	36.0	35.0	34.0	23.0	32.0	11.0	10.0	19.0	38.0
S79	70.0	70.0	70.0	70.0	70.0	49.0	57.0	44.0	22.0	20.0	8.0	16.0	15.0	13.0	1.0	70.0
S83	38.0	48.0	48.0	36.0	33.0	32.0	11.0	30.0	19.0	19.0	21.0	20.0	9.0	8.0	7.0	48.0
Mean	42.2	49.8	45.7	49.7	45.8	48.3	38.7	35.7	29.3	27.5	23.3	23.7	21.0	21.3	13.3	58.0
S.D.	15.2	17.7	19.4	14.2	18.3	11.9	16.8	9.8	11.0	18.3	10.6	10.9	23.6	18.6	14.4	12.7

Frequency 0.250 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	37.0	26.0	25.0	34.0	43.0	61.0	30.0	50.0	39.0	38.0	47.0	46.0	35.0	34.0	33.0	61.0
S54	58.0	64.0	73.0	71.0	69.0	67.0	55.0	63.0	41.0	29.0	47.0	36.0	24.0	22.0	20.0	73.0
S59	56.0	55.0	63.0	63.0	76.0	77.0	46.0	35.0	24.0	19.0	18.0	16.0	26.0	15.0	24.0	77.0
S67	44.0	44.0	44.0	54.0	54.0	44.0	43.0	42.0	41.0	50.0	39.0	58.0	57.0	36.0	25.0	58.0
S79	92.0	92.0	92.0	92.0	82.0	51.0	69.0	46.0	44.0	42.0	30.0	28.0	27.0	25.0	23.0	92.0
S83	42.0	42.0	42.0	40.0	47.0	36.0	35.0	24.0	3.0	13.0	34.0	24.0	33.0	32.0	21.0	47.0
Mean	54.8	53.8	56.5	59.0	61.8	56.0	46.3	43.3	32.0	31.8	35.8	34.7	33.7	27.3	24.3	68.0
S.D.	20.0	22.7	24.2	21.3	16.1	15.2	14.1	13.3	15.9	14.1	11.1	15.4	12.2	8.1	4.6	15.9

Frequency 0.500 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	32.0	30.0	19.0	48.0	57.0	65.0	44.0	54.0	43.0	52.0	51.0	40.0	39.0	38.0	37.0	65.0
S54	62.0	69.0	77.0	65.0	73.0	61.0	49.0	47.0	45.0	23.0	31.0	30.0	18.0	26.0	14.0	77.0
S59	66.0	85.0	74.0	83.0	86.0	77.0	46.0	25.0	34.0	29.0	28.0	27.0	26.0	25.0	24.0	86.0
S67	44.0	44.0	54.0	54.0	44.0	54.0	43.0	42.0	41.0	50.0	49.0	48.0	37.0	16.0	15.0	54.0
S79	94.0	94.0	94.0	94.0	80.0	53.0	61.0	38.0	26.0	24.0	22.0	30.0	29.0	27.0	25.0	94.0
S83	66.0	76.0	66.0	54.0	61.0	50.0	39.0	28.0	37.0	37.0	29.0	38.0	27.0	26.0	25.0	76.0
Mean	60.7	66.3	64.0	66.3	66.8	60.0	47.0	39.0	37.7	35.8	35.0	35.5	29.3	26.3	23.3	75.3
S.D.	21.3	24.6	25.7	18.4	15.7	10.0	7.6	11.1	7.0	12.8	12.0	7.9	7.7	7.0	8.4	14.3

Temporary Threshold Shift (dB): 3550 Hz center frequency, 139 dB peak SPL

Frequency 1.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	43.0	42.0	51.0	70.0	59.0	67.0	66.0	66.0	65.0	64.0	63.0	62.0	61.0	60.0	59.0	70.0
S54	64.0	71.0	89.0	87.0	65.0	63.0	61.0	69.0	57.0	45.0	33.0	32.0	30.0	27.0	26.0	89.0
S59	78.0	93.0	86.0	85.0	78.0	69.0	38.0	27.0	46.0	41.0	40.0	29.0	28.0	47.0	26.0	93.0
S67	98.0	78.0	78.0	58.0	68.0	68.0	67.0	66.0	65.0	54.0	53.0	52.0	61.0	60.0	49.0	98.0
S79	100.0	100.0	100.0	100.0	100.0	79.0	87.0	64.0	62.0	60.0	48.0	56.0	35.0	33.0	41.0	100.0
S83	71.0	81.0	81.0	59.0	66.0	65.0	54.0	33.0	52.0	42.0	44.0	43.0	32.0	31.0	20.0	81.0
Mean	75.7	77.5	80.8	76.5	72.7	68.5	62.2	54.2	57.8	51.0	46.8	45.7	41.2	43.0	36.8	88.5
S.D.	21.5	20.3	16.5	16.9	14.8	5.6	16.2	18.9	7.7	9.8	10.5	13.3	15.5	14.8	15.3	11.3

Frequency 1.400 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	41.0	40.0	49.0	68.0	67.0	65.0	64.0	64.0	63.0	62.0	61.0	60.0	59.0	68.0	67.0	68.0
S54	66.0	73.0	91.0	89.0	67.0	65.0	73.0	71.0	59.0	47.0	25.0	34.0	32.0	40.0	38.0	91.0
S59	70.0	89.0	78.0	95.0	80.0	71.0	40.0	49.0	58.0	63.0	62.0	41.0	30.0	19.0	48.0	95.0
S67	96.0	66.0	66.0	76.0	66.0	66.0	65.0	64.0	63.0	52.0	51.0	60.0	59.0	58.0	57.0	96.0
S79	98.0	98.0	98.0	98.0	98.0	77.0	85.0	72.0	60.0	58.0	26.0	54.0	43.0	31.0	29.0	98.0
S83	90.0	90.0	80.0	78.0	65.0	64.0	63.0	42.0	61.0	61.0	43.0	42.0	41.0	40.0	49.0	90.0
Mean	76.8	76.0	77.0	84.0	73.8	68.0	65.0	60.3	60.7	57.2	44.7	48.5	44.0	42.7	48.0	89.7
S.D.	22.1	21.2	17.6	11.8	13.1	5.1	14.8	12.2	2.1	6.4	16.4	11.0	12.6	17.8	13.4	11.0

Frequency 2.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	53.0	52.0	71.0	70.0	69.0	77.0	66.0	56.0	65.0	74.0	53.0	62.0	61.0	60.0	59.0	77.0
S54	56.0	83.0	91.0	89.0	67.0	65.0	63.0	61.0	59.0	47.0	45.0	44.0	42.0	40.0	38.0	91.0
S59	66.0	85.0	84.0	83.0	86.0	77.0	46.0	55.0	44.0	59.0	58.0	47.0	46.0	55.0	44.0	86.0
S67	62.0	62.0	82.0	92.0	82.0	62.0	61.0	50.0	39.0	48.0	47.0	56.0	45.0	44.0	43.0	92.0
S79	100.0	100.0	100.0	100.0	100.0	79.0	87.0	74.0	72.0	60.0	58.0	56.0	45.0	43.0	41.0	100.0
S83	70.0	80.0	70.0	78.0	65.0	54.0	43.0	52.0	31.0	31.0	33.0	32.0	31.0	30.0	39.0	80.0
Mean	67.8	77.0	83.0	85.3	78.2	69.0	61.0	58.0	51.7	53.2	49.0	49.5	45.0	45.3	44.0	87.7
S.D.	17.0	17.3	11.6	10.6	13.7	10.2	15.8	8.7	16.1	14.6	9.5	10.8	9.6	10.8	7.7	8.4

Temporary Threshold Shift (dB): 3550 Hz center frequency, 139 dB peak SPL

Frequency 2.800 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	39.0	48.0	57.0	56.0	65.0	63.0	62.0	62.0	61.0	50.0	59.0	58.0	47.0	56.0	65.0	65.0
S54	74.0	71.0	89.0	87.0	75.0	63.0	62.0	59.0	67.0	45.0	43.0	42.0	40.0	38.0	36.0	87.0
S59	68.0	98.0	86.0	85.0	78.0	59.0	38.0	57.0	46.0	41.0	60.0	39.0	48.0	47.0	46.0	98.0
S67	64.0	74.0	74.0	94.0	74.0	54.0	53.0	42.0	61.0	50.0	49.0	58.0	57.0	56.0	65.0	94.0
S79	100.0	100.0	100.0	100.0	100.0	79.0	77.0	74.0	72.0	70.0	48.0	66.0	45.0	53.0	51.0	100.0
S83	88.0	78.0	58.0	76.0	63.0	72.0	61.0	50.0	49.0	49.0	51.0	30.0	49.0	38.0	47.0	88.0
Mean	72.2	78.2	77.3	83.0	75.8	65.0	58.8	57.3	59.3	50.8	51.7	48.8	47.7	48.0	51.7	89.0
S.D.	21.0	19.2	17.5	15.5	13.2	9.1	12.8	10.9	10.1	10.0	6.6	13.9	5.6	8.4	11.4	12.7

Frequency 4.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	33.0	32.0	51.0	50.0	59.0	57.0	46.0	56.0	55.0	64.0	63.0	52.0	61.0	50.0	59.0	64.0
S54	64.0	81.0	79.0	77.0	65.0	63.0	61.0	79.0	57.0	35.0	43.0	42.0	40.0	38.0	36.0	81.0
S59	54.0	82.0	72.0	81.0	74.0	55.0	44.0	13.0	42.0	27.0	36.0	45.0	44.0	53.0	22.0	82.0
S67	50.0	60.0	50.0	70.0	60.0	50.0	49.0	38.0	37.0	46.0	45.0	44.0	43.0	42.0	51.0	70.0
S79	100.0	100.0	100.0	100.0	100.0	79.0	77.0	74.0	62.0	60.0	58.0	46.0	35.0	43.0	31.0	100.0
S83	56.0	76.0	76.0	74.0	51.0	60.0	59.0	48.0	47.0	37.0	49.0	28.0	37.0	36.0	25.0	76.0
Mean	59.5	71.8	71.3	75.3	68.2	60.7	56.0	51.3	50.0	44.8	49.0	42.8	43.3	43.7	37.3	78.8
S.D.	22.3	23.3	18.8	16.2	17.3	10.0	12.4	24.3	9.6	14.7	10.0	8.0	9.3	6.7	14.7	12.4

Frequency 5.700 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	39.0	48.0	47.0	66.0	65.0	53.0	52.0	52.0	51.0	50.0	59.0	58.0	47.0	46.0	55.0	66.0
S54	72.0	69.0	87.0	85.0	73.0	61.0	69.0	67.0	65.0	43.0	41.0	50.0	38.0	36.0	34.0	87.0
S59	90.0	100.0	78.0	95.0	80.0	61.0	50.0	49.0	48.0	23.0	32.0	41.0	40.0	49.0	48.0	100.0
S67	58.0	68.0	68.0	68.0	58.0	48.0	57.0	46.0	45.0	44.0	43.0	52.0	51.0	50.0	49.0	68.0
S79	96.0	96.0	96.0	96.0	96.0	85.0	73.0	70.0	68.0	56.0	54.0	52.0	41.0	39.0	37.0	96.0
S83	78.0	88.0	78.0	76.0	73.0	62.0	61.0	50.0	59.0	49.0	51.0	50.0	39.0	48.0	37.0	88.0
Mean	72.2	78.2	75.7	81.0	74.2	61.7	60.3	55.7	56.0	44.2	46.7	50.5	42.7	44.7	43.3	84.2
S.D.	21.1	19.9	16.9	13.1	13.1	12.7	9.2	10.2	9.4	11.4	9.9	5.5	5.2	5.8	8.4	14.2

Temporary Threshold Shift (dB): 3550 Hz center frequency, 139 dB peak SPL

Frequency 8.000 kHz

Animal\day	0.	.042	.125	.25	1.	2.	6.	9.	13.	16.	20.	23.	27.	29.	30.	Max
S44	15.0	34.0	33.0	52.0	41.0	49.0	58.0	58.0	47.0	36.0	45.0	44.0	43.0	42.0	41.0	58.0
S54	60.0	77.0	85.0	83.0	71.0	69.0	93.0	75.0	63.0	31.0	39.0	48.0	46.0	44.0	22.0	93.0
S59	66.0	79.0	58.0	77.0	70.0	71.0	50.0	29.0	48.0	33.0	42.0	41.0	50.0	39.0	48.0	79.0
S67	56.0	56.0	46.0	76.0	66.0	56.0	55.0	54.0	53.0	52.0	51.0	50.0	49.0	58.0	47.0	76.0
S79	94.0	94.0	94.0	94.0	94.0	94.0	94.0	88.0	66.0	54.0	52.0	60.0	49.0	37.0	45.0	94.0
S83	66.0	66.0	76.0	74.0	61.0	40.0	49.0	48.0	47.0	27.0	39.0	48.0	27.0	26.0	25.0	76.0
Mean	59.5	67.7	65.3	76.0	67.2	63.2	66.5	58.7	54.0	38.8	44.7	48.5	44.0	41.0	38.0	79.3
S.D.	25.6	20.9	23.6	13.8	17.1	19.2	21.2	20.7	8.5	11.4	5.8	6.5	8.7	10.4	11.5	13.3

3550 Hz center frequency, 139 dB peak SPL

Total number of cochlear sensory cells missing

Animal number	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Total outer hair cells
S44	314	1430	1611	1383	4424
S54	174	2036	1792	1650	5478
S59	450	1790	1754	1457	5001
S67	318	1803	1838	1755	5396
S79	131	1523	1414	1418	4355
S83	298	1837	1806	1779	5422
Group mean	281				5013
S.D.	114				512
S.E.	47				209

Total sensory cell losses over octave band lengths of the cochlea centered at the frequencies indicated

	Octave band center frequency	Inner hair cells	Outer hair cells
Group means			
	0.125 kHz	4.2	70.5
	0.25 kHz	6.5	67.2
	0.5 kHz	4.5	382.7
	1 kHz	39.8	805.8
	2 kHz	80.8	983.8
	4 kHz	42.2	965.2
	8 kHz	35.8	979.3
	16 kHz	67.0	758.2
Standard deviations			
	0.125 kHz	4.6	69.7
	0.25 kHz	4.8	44.4
	0.5 kHz	2.5	161.7
	1 kHz	26.7	204.0
	2 kHz	79.3	29.7
	4 kHz	41.6	63.9
	8 kHz	33.0	32.2
	16 kHz	58.7	283.1

3550 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S44D							
0.125 kHz	1	2	23	46	71	0	1
0.25 kHz	3	13	6	28	47	0	0
0.5 kHz	1	71	106	33	210	0	0
1 kHz	27	139	213	78	430	56	32
2 kHz	200	328	333	326	987	433	269
4 kHz	21	295	300	257	852	3	1
8 kHz	41	317	327	309	953	0	0
16 kHz	20	265	303	306	874	6	3
TOTALS	314	1430	1611	1383	4424	498	306
Chinchilla S54D							
0.125 kHz	9	98	71	38	207	0	1
0.25 kHz	13	77	9	32	118	0	0
0.5 kHz	7	271	136	49	456	0	3
1 kHz	39	306	292	248	846	51	15
2 kHz	44	324	324	324	972	100	70
4 kHz	13	323	323	322	968	32	42
8 kHz	4	323	323	323	969	10	47
16 kHz	45	314	314	314	942	21	19
TOTALS	174	2036	1792	1650	5478	214	197
Chinchilla S59D							
0.125 kHz	11	6	7	5	18	0	1
0.25 kHz	6	85	6	38	129	0	0
0.5 kHz	5	143	184	26	353	2	4
1 kHz	22	300	301	132	733	32	31
2 kHz	161	323	323	323	969	338	288
4 kHz	100	322	322	322	966	166	255
8 kHz	82	322	322	322	966	116	117
16 kHz	63	289	289	289	867	95	83
TOTALS	450	1790	1754	1457	5001	749	779

3550 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S67D							
0.125 kHz	0	7	6	11	24	0	3
0.25 kHz	2	12	5	12	29	0	0
0.5 kHz	5	199	199	78	476	3	8
1 kHz	61	320	333	338	991	128	131
2 kHz	47	347	347	347	1041	70	113
4 kHz	91	348	348	348	1044	135	149
8 kHz	13	346	347	346	1039	4	16
16 kHz	99	224	253	275	752	131	104
TOTALS	318	1803	1838	1755	5396	471	524
Chinchilla S79D							
0.125 kHz	2	4	16	28	48	0	1
0.25 kHz	3	3	8	37	48	0	0
0.5 kHz	2	138	36	20	194	0	5
1 kHz	81	314	304	280	898	165	112
2 kHz	17	334	334	309	977	20	31
4 kHz	10	334	334	334	1002	24	149
8 kHz	8	327	332	333	992	21	89
16 kHz	8	69	50	77	196	0	2
TOTALS	131	1523	1414	1418	4355	230	389
Chinchilla S83D							
0.125 kHz	2	24	16	15	55	0	4
0.25 kHz	12	15	8	9	32	0	0
0.5 kHz	7	220	204	183	607	2	5
1 kHz	9	313	313	311	937	7	73
2 kHz	16	320	320	317	957	12	113
4 kHz	18	320	320	319	959	26	66
8 kHz	67	319	319	319	957	144	122
16 kHz	167	306	306	306	918	260	176
TOTALS	298	1837	1806	1779	5422	451	559

3550 Hz center frequency, 139 dB peak SPL

Total sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	4.2	23.5	23.2	23.8	70.5	0.0	1.8
0.25 kHz	6.5	34.2	7.0	26.0	67.2	0.0	0.0
0.5 kHz	4.5	173.7	144.2	64.8	382.7	1.2	4.2
1 kHz	39.8	282.0	292.7	231.2	805.8	73.2	65.7
2 kHz	80.8	329.3	330.2	324.3	983.8	162.2	147.3
4 kHz	42.2	323.7	324.5	317.0	965.2	64.3	110.3
8 kHz	35.8	325.7	328.3	325.3	979.3	49.2	65.2
16 kHz	67.0	244.5	252.5	261.2	758.2	85.5	64.5
TOTALS	280.8	1736.5	1702.5	1573.7	5012.7	435.5	459.0
Group standard deviations							
0.125 kHz	4.6	37.3	24.3	16.2	69.7	0.0	1.3
0.25 kHz	4.8	36.6	1.5	12.6	44.4	0.0	0.0
0.5 kHz	2.5	70.7	65.4	61.5	161.7	1.3	2.6
1 kHz	26.7	70.4	41.4	103.7	204.0	60.5	47.7
2 kHz	79.3	9.9	10.0	12.7	29.7	178.5	106.3
4 kHz	41.6	17.5	15.9	31.3	63.9	68.2	92.2
8 kHz	33.0	10.5	10.2	12.7	32.2	63.6	51.9
16 kHz	58.7	91.9	101.5	91.3	283.1	100.4	69.4
TOTALS	114.2	222.1	162.1	176.1	511.9	197.5	206.7

3550 Hz center frequency, 139 dB peak SPL

Percent sensory cell losses over octave band frequencies

	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S44D							
0.125 kHz	0.6	1.0	11.5	23.0	11.8	0.0	0.5
0.25 kHz	1.1	3.7	1.7	8.0	4.5	0.0	0.0
0.5 kHz	0.3	20.4	30.4	9.4	20.1	0.0	0.0
1 kHz	10.5	41.7	63.9	23.4	43.0	10.4	9.6
2 kHz	79.0	96.1	97.6	95.6	96.4	78.8	78.8
4 kHz	7.7	86.7	88.2	75.5	83.5	0.5	0.2
8 kHz	14.9	93.2	96.1	90.8	93.4	0.0	0.0
16 kHz	7.5	81.0	92.6	93.5	89.0	1.1	0.9
Chinchilla S54D							
0.125 kHz	6.2	51.5	37.3	20.0	36.3	0.0	0.5
0.25 kHz	5.1	23.1	2.7	9.6	11.8	0.0	0.0
0.5 kHz	2.8	81.6	40.9	14.7	45.7	0.0	0.9
1 kHz	15.9	96.8	92.4	78.4	89.2	9.9	4.7
2 kHz	18.1	100.0	100.0	100.0	100.0	19.1	21.6
4 kHz	5.1	100.0	100.0	99.6	99.9	6.1	13.0
8 kHz	1.5	100.0	100.0	100.0	100.0	1.9	14.5
16 kHz	17.7	100.0	100.0	100.0	100.0	4.1	6.0
Chinchilla S59D							
0.125 kHz	7.6	3.1	3.7	2.6	3.1	0.0	0.5
0.25 kHz	2.4	25.6	1.8	11.4	12.9	0.0	0.0
0.5 kHz	2.0	43.4	55.9	7.9	35.7	0.3	1.2
1 kHz	9.0	95.2	95.5	41.9	77.5	6.2	9.8
2 kHz	67.0	100.0	100.0	100.0	100.0	65.0	89.1
4 kHz	38.6	100.0	100.0	100.0	100.0	31.9	79.1
8 kHz	31.5	100.0	100.0	100.0	100.0	22.3	36.3
16 kHz	27.0	100.0	100.0	100.0	100.0	20.4	28.7

3550 Hz center frequency, 139 dB peak SPL

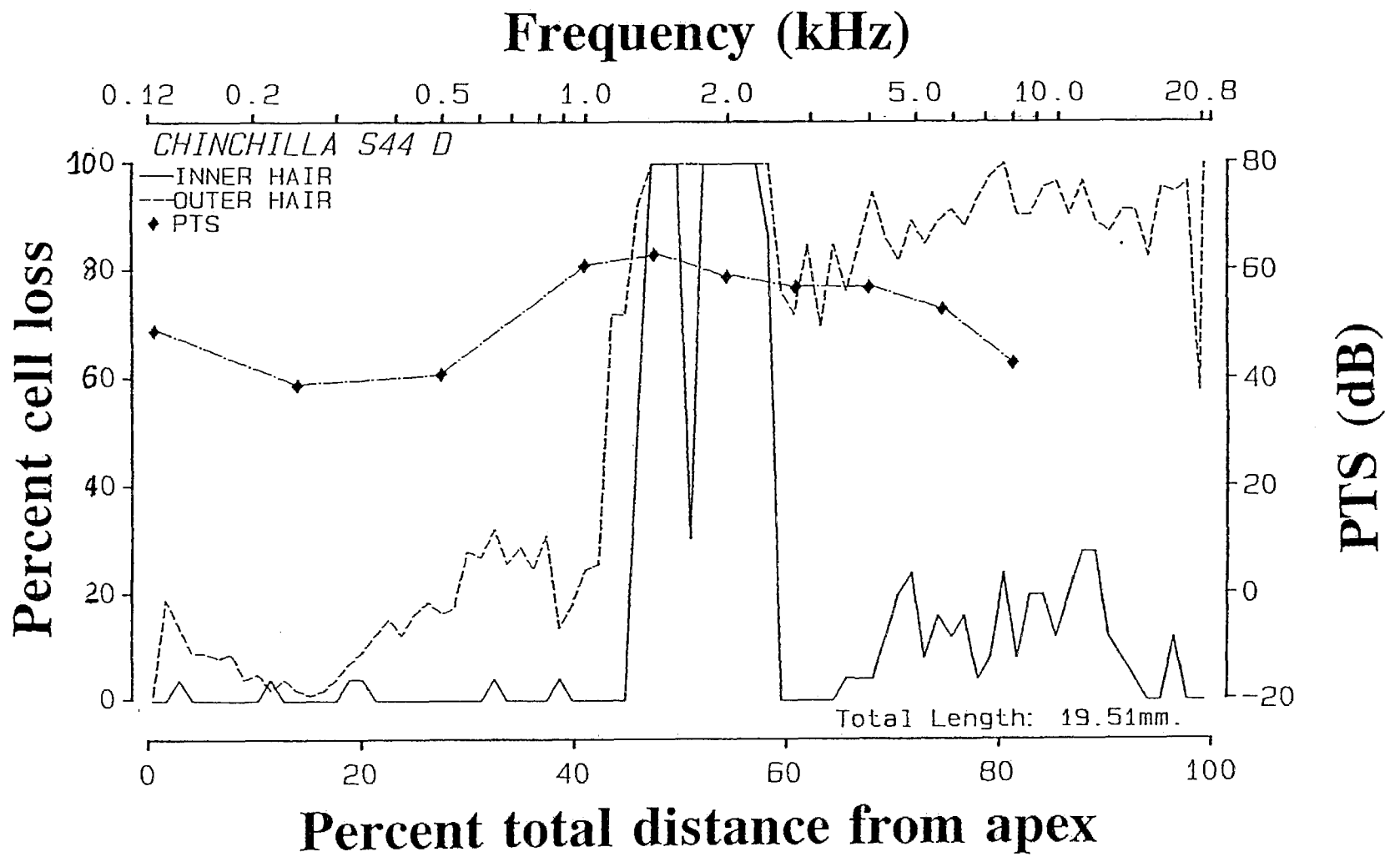
Percent sensory cell losses over octave band frequencies

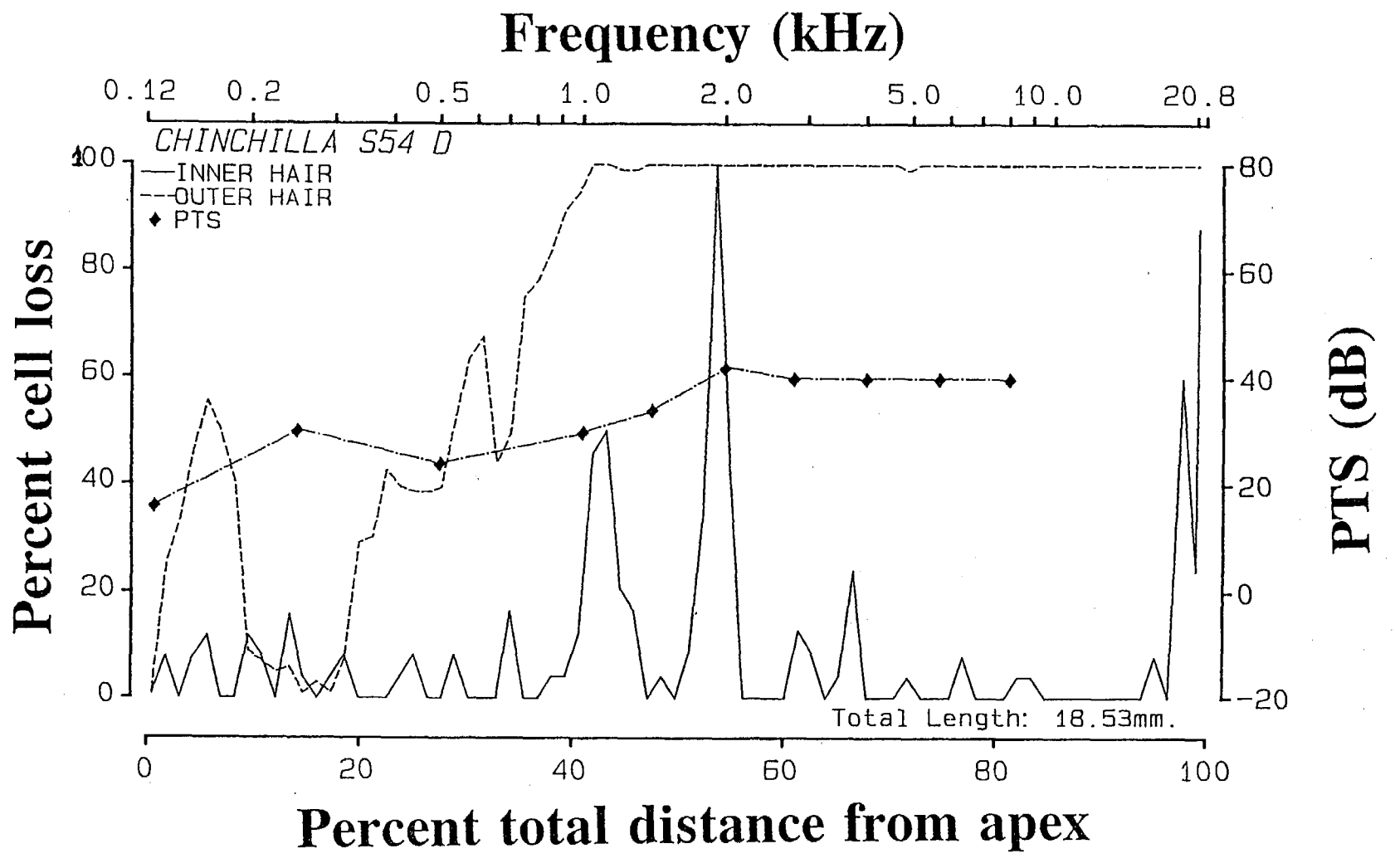
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Chinchilla S67D							
0.125 kHz	0.0	3.4	2.9	5.3	3.9	0.0	1.4
0.25 kHz	0.7	3.3	1.4	3.3	2.7	0.0	0.0
0.5 kHz	1.8	56.0	56.0	21.9	44.6	0.5	2.2
1 kHz	23.2	93.8	97.6	99.1	96.8	23.3	38.4
2 kHz	18.2	100.0	100.0	100.0	100.0	12.4	32.5
4 kHz	32.6	100.0	100.0	100.0	100.0	24.1	42.8
8 kHz	4.6	99.7	100.0	99.7	99.8	0.7	4.6
16 kHz	39.4	72.0	81.3	88.4	80.6	26.0	33.4
Chinchilla S79D							
0.125 kHz	1.3	2.0	8.1	14.2	8.1	0.0	0.5
0.25 kHz	1.1	0.8	2.3	10.7	4.6	0.0	0.0
0.5 kHz	0.7	40.2	10.4	5.8	18.8	0.0	1.4
1 kHz	32.0	96.0	92.9	85.6	91.5	31.2	34.2
2 kHz	6.8	100.0	100.0	92.5	97.5	3.7	9.2
4 kHz	3.7	100.0	100.0	100.0	100.0	4.4	44.6
8 kHz	2.9	97.6	99.1	99.4	98.7	3.8	26.5
16 kHz	3.2	22.6	16.4	25.3	21.4	0.0	0.6
Chinchilla S83D							
0.125 kHz	1.4	12.7	8.5	7.9	9.7	0.0	2.1
0.25 kHz	4.8	4.5	2.4	2.7	3.2	0.0	0.0
0.5 kHz	2.8	67.2	62.3	55.9	61.8	0.3	1.5
1 kHz	3.7	100.0	100.0	99.3	99.8	1.3	23.3
2 kHz	6.7	100.0	100.0	99.0	99.7	2.3	35.3
4 kHz	7.0	100.0	100.0	99.6	99.9	5.0	20.6
8 kHz	26.0	100.0	100.0	100.0	100.0	27.9	38.2
16 kHz	67.6	100.0	100.0	100.0	100.0	52.7	57.5

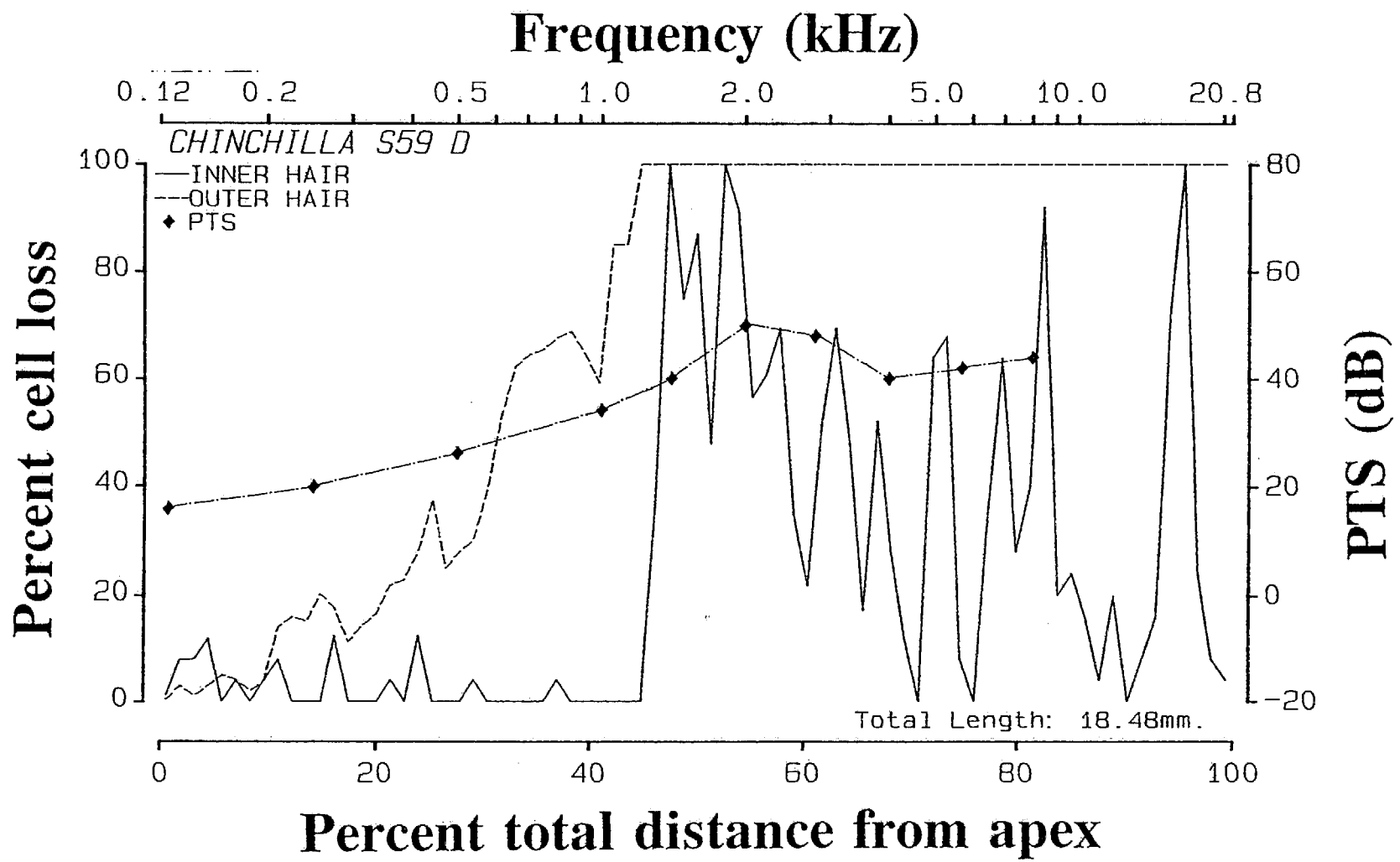
3550 Hz center frequency, 139 dB peak SPL

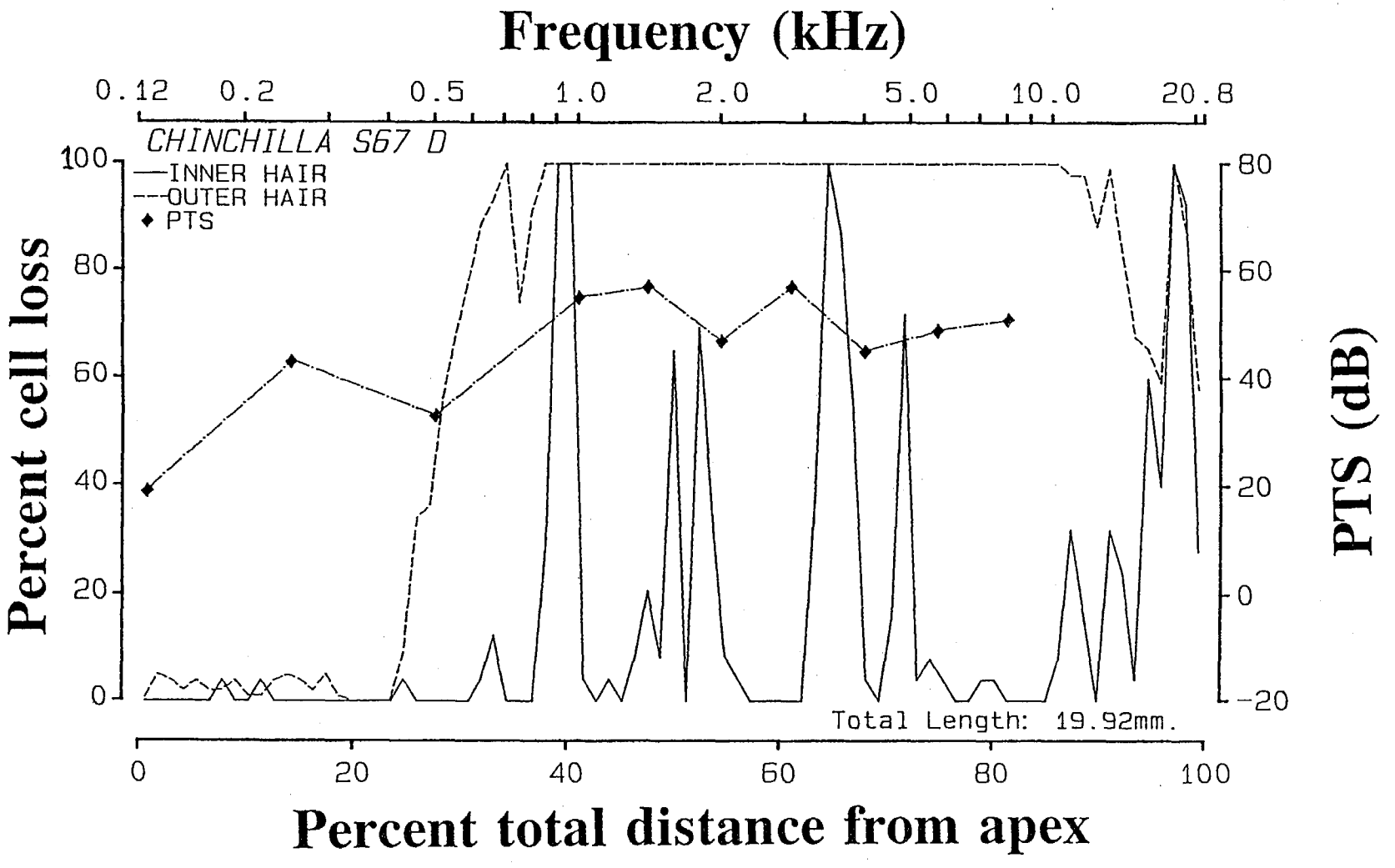
Percent sensory cell losses over octave band frequencies

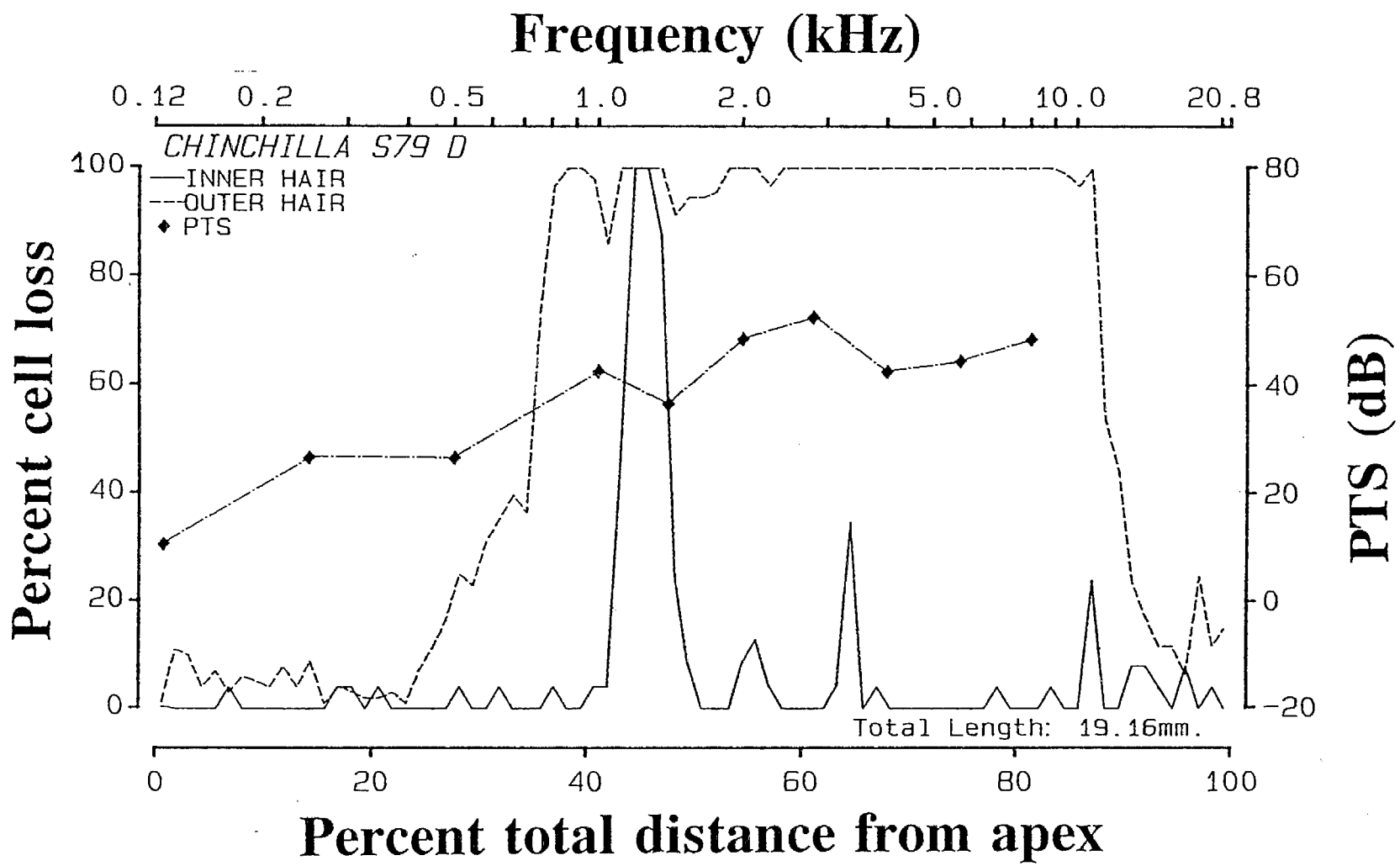
	Inner hair cells	1st row outer hair cells	2nd row outer hair cells	3rd row outer hair cells	Comb. outer hair cells	Inner pillar cells	Outer pillar cells
Group means							
0.125 kHz	2.85	12.28	12.00	12.17	12.15	0.00	0.92
0.25 kHz	2.53	10.17	2.05	7.62	6.61	0.00	0.00
0.5 kHz	1.73	51.47	42.65	19.27	37.79	0.18	1.20
1 kHz	15.72	87.25	90.38	71.28	82.97	13.72	20.00
2 kHz	32.63	99.35	99.60	97.85	98.93	30.22	44.42
4 kHz	15.78	97.78	98.03	95.78	97.20	12.00	33.38
8 kHz	13.57	98.42	99.20	98.32	98.64	9.43	20.02
16 kHz	27.07	79.27	81.72	84.53	81.84	17.38	21.18
Group standard deviations							
0.125 kHz	3.21	19.67	12.80	8.24	12.28	0.00	0.68
0.25 kHz	1.96	11.08	0.49	3.76	4.53	0.00	0.00
0.5 kHz	1.05	21.60	19.66	18.86	16.52	0.21	0.73
1 kHz	10.37	22.41	13.29	31.53	21.04	11.26	14.12
2 kHz	31.91	1.59	0.98	3.13	1.57	33.15	32.14
4 kHz	15.53	5.43	4.82	9.94	6.73	12.78	28.23
8 kHz	12.79	2.72	1.56	3.69	2.63	12.33	16.17
16 kHz	23.81	30.19	32.83	29.40	30.63	20.37	22.76

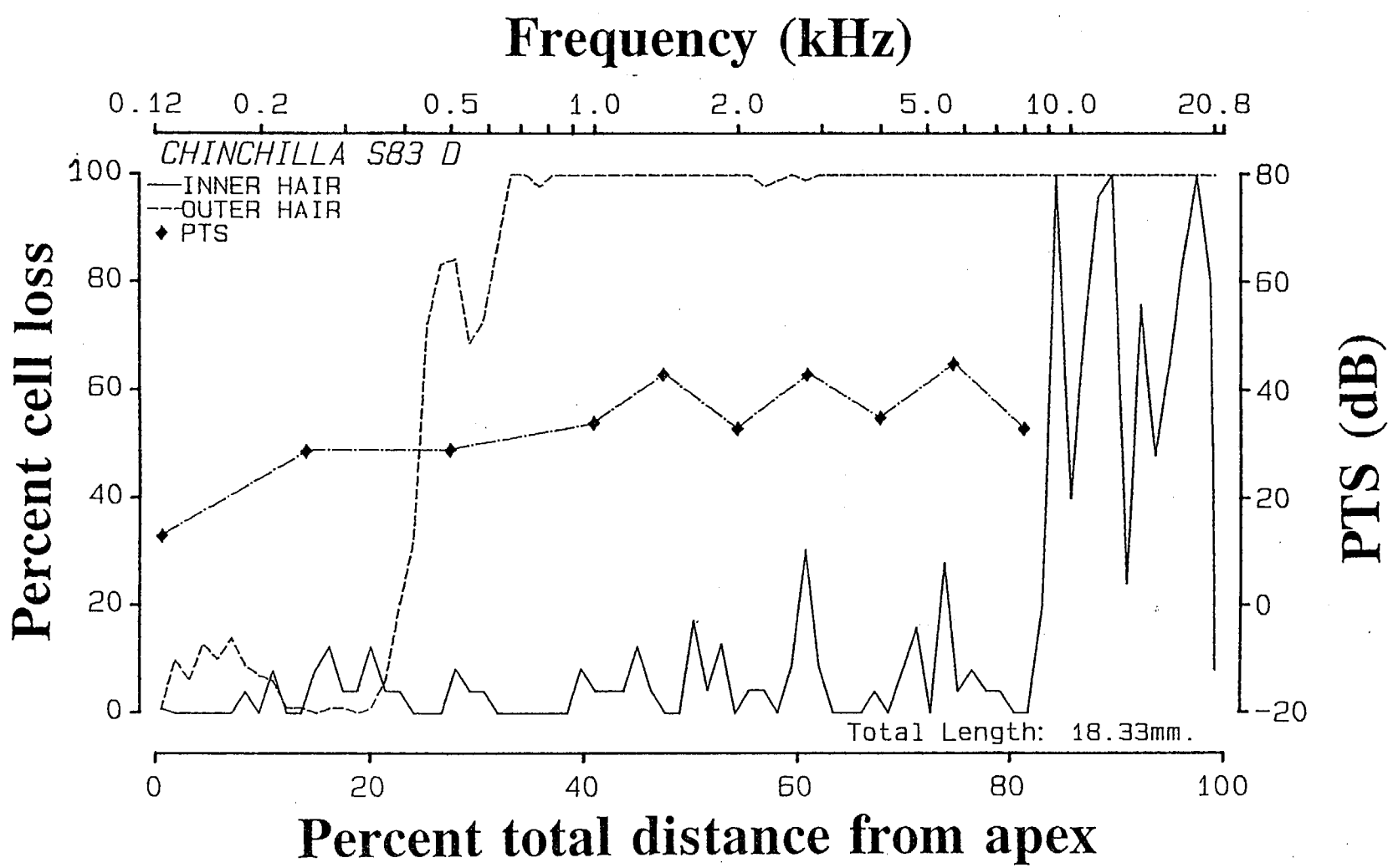

Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S44 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.51mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S54 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.53mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S59 D
—INNER HAIR
---OUTER HAIR
◆ PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.48mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S67 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.92mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S79 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 19.16mm.
0
20
40
60
80
100
Percent total distance from apex


Frequency (kHz)
0.12
0.2
0.5
1.0
2.0
5.0
10.0
20.8
CHINCHILLA S83 D
INNER HAIR
OUTER HAIR
PTS
Percent cell loss
100
80
60
40
20
0
PTS (dB)
80
60
40
20
0
-20
Total Length: 18.33mm.
0
20
40
60
80
100
Percent total distance from apex