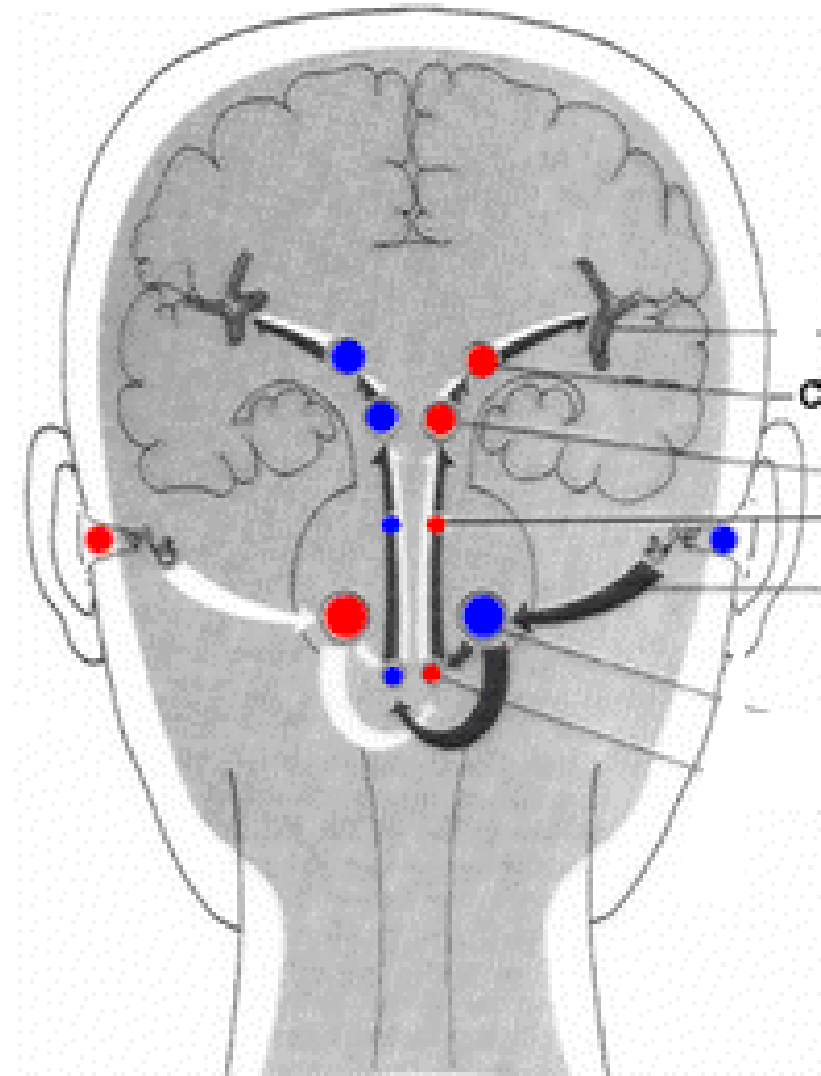


Die Hörbahn

- Übersicht
- Hirnstamm
- Mittelhirn
- Zwischenhirn
- Kortex

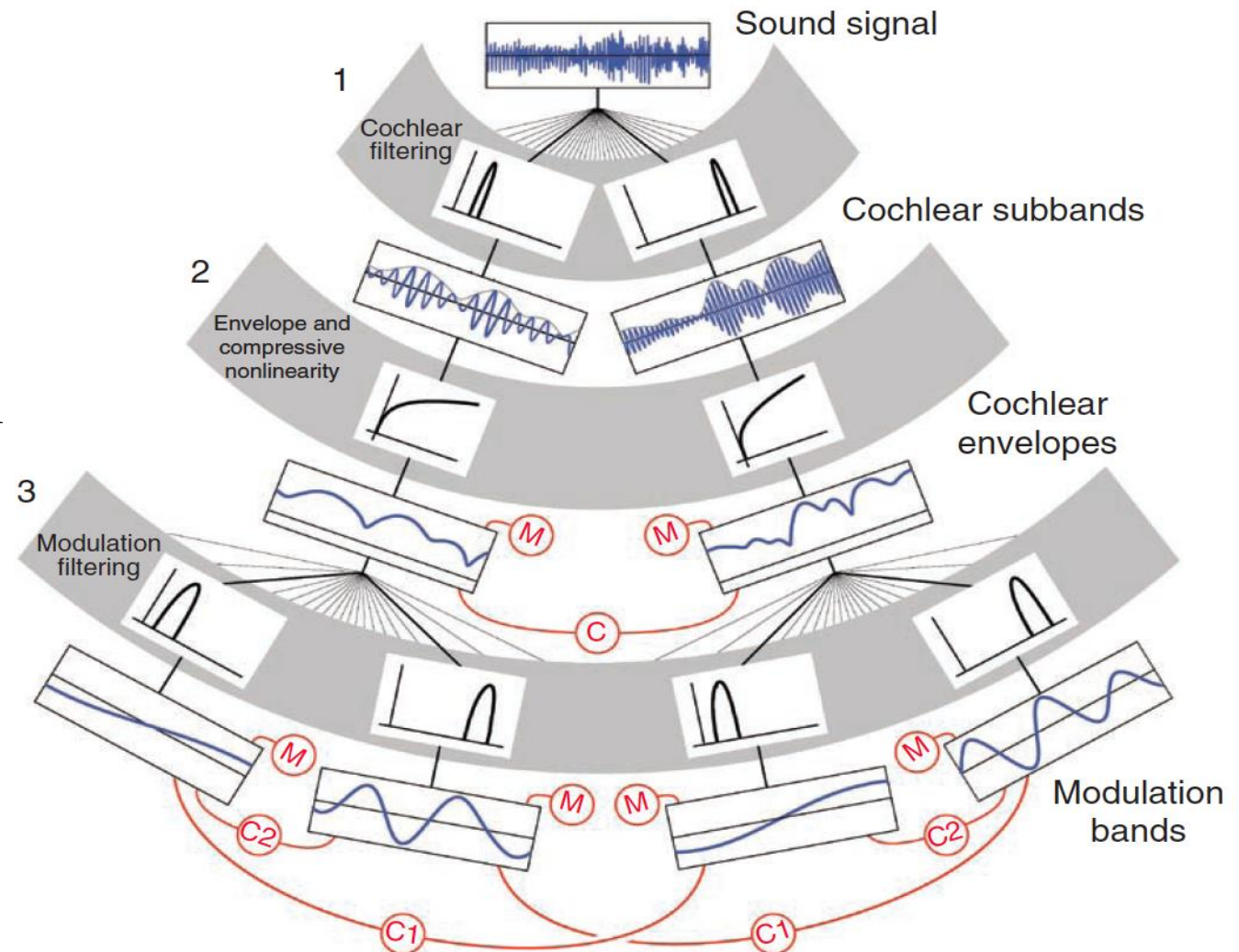


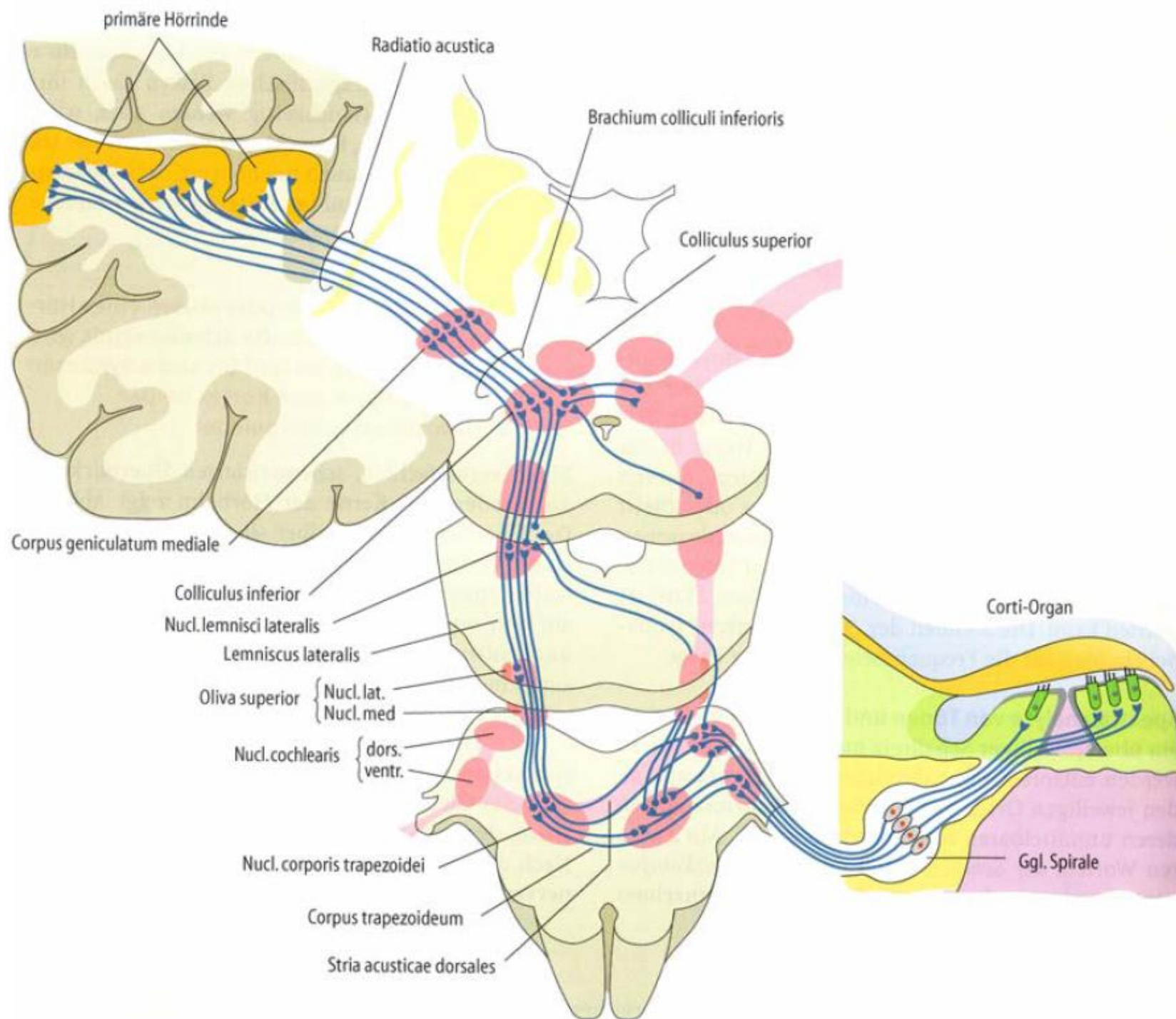
Texture extraction by time-averaged statistics

Josh H McDermott, Michael Schemitsch & Eero P Simoncelli, 2013

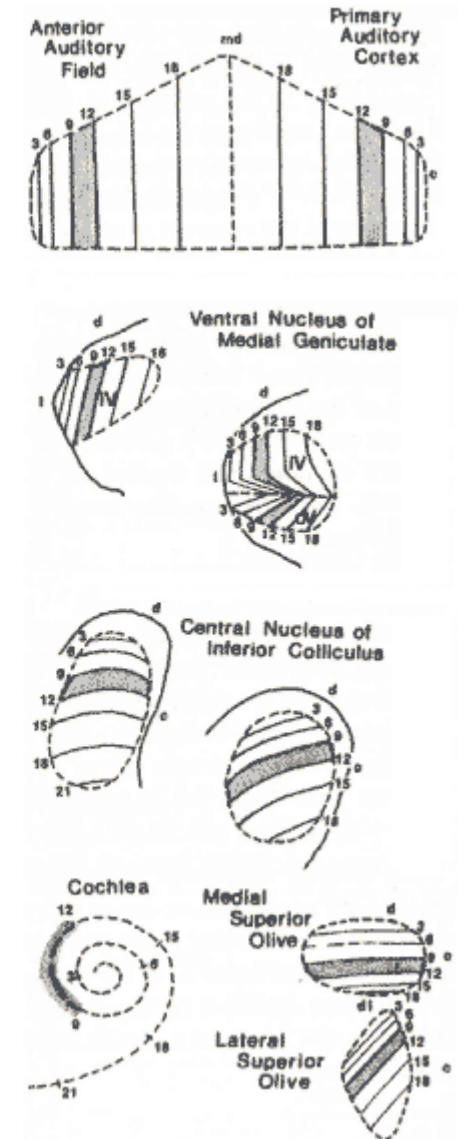
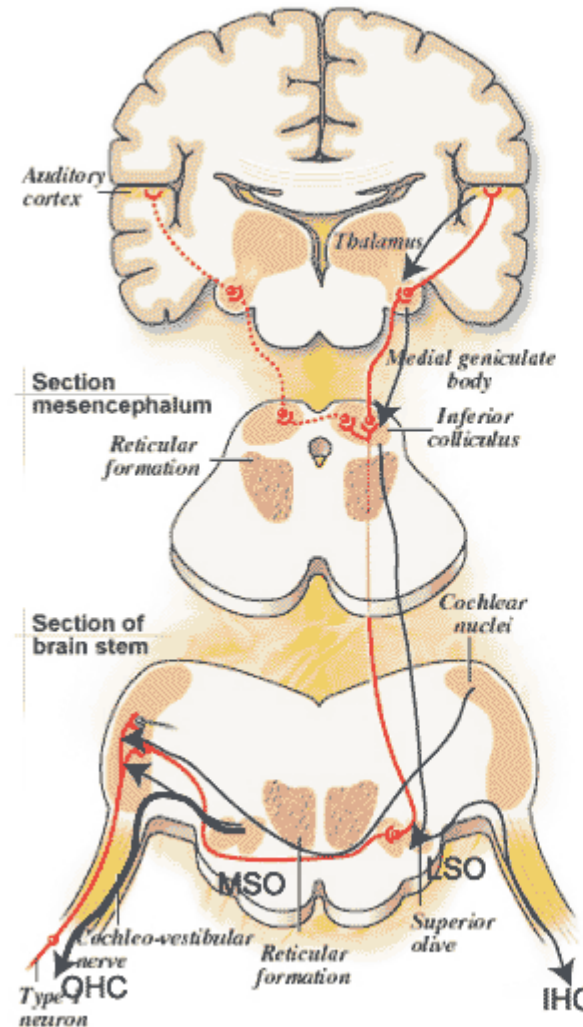
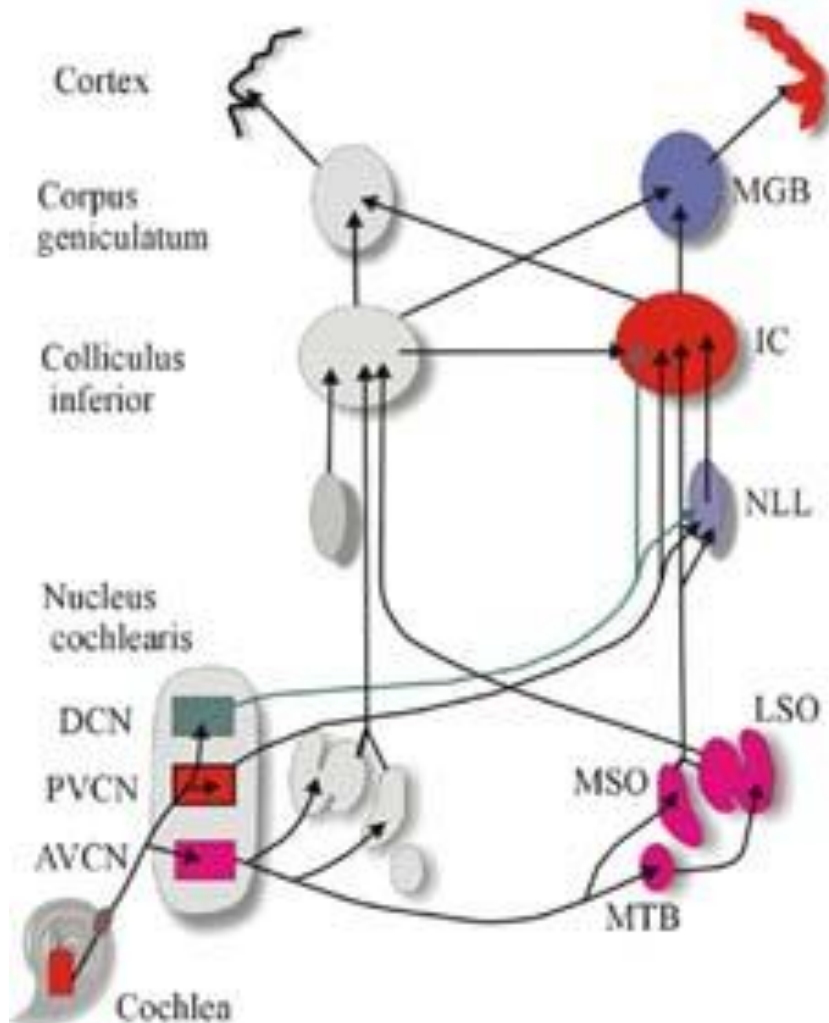
Filter banks:

- Frequency
- Spectral Modulation
- Temporal Modulation



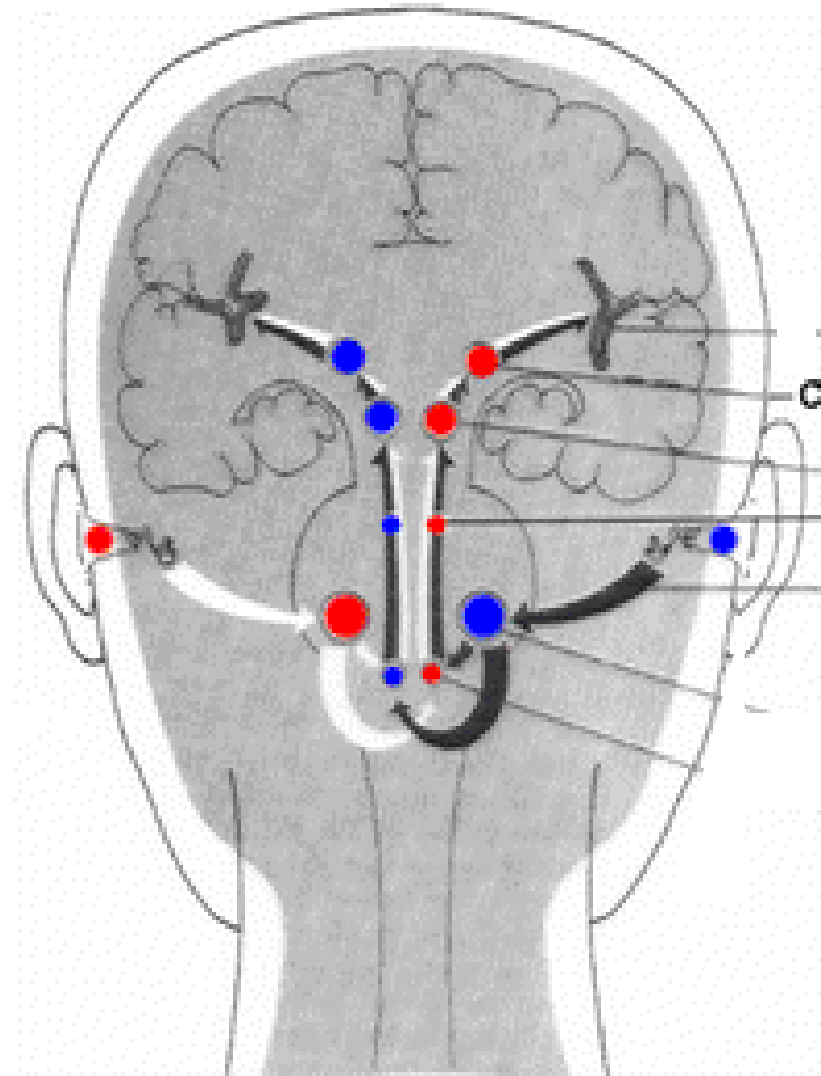


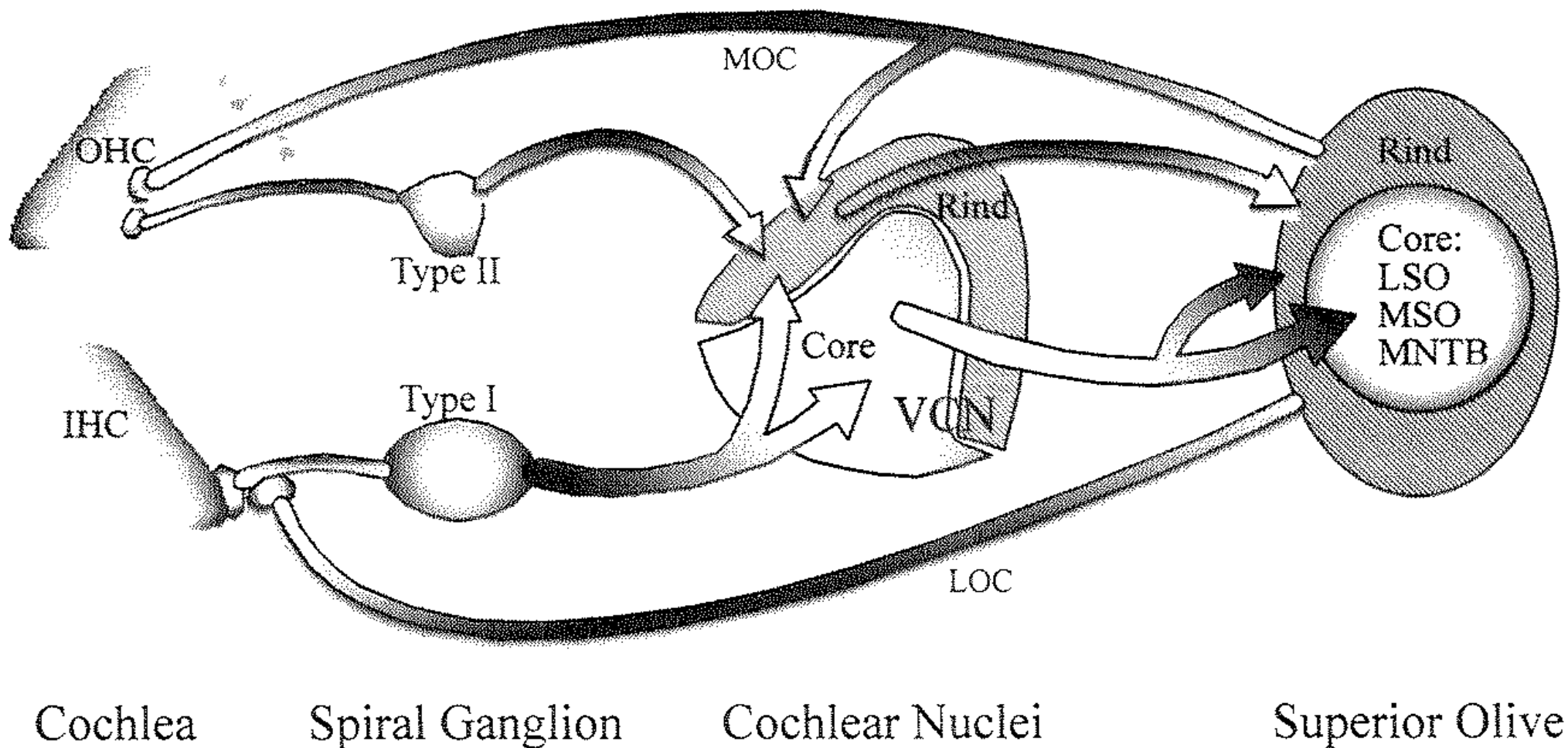
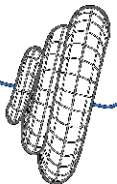
Afferenzen des auditorischen Systems

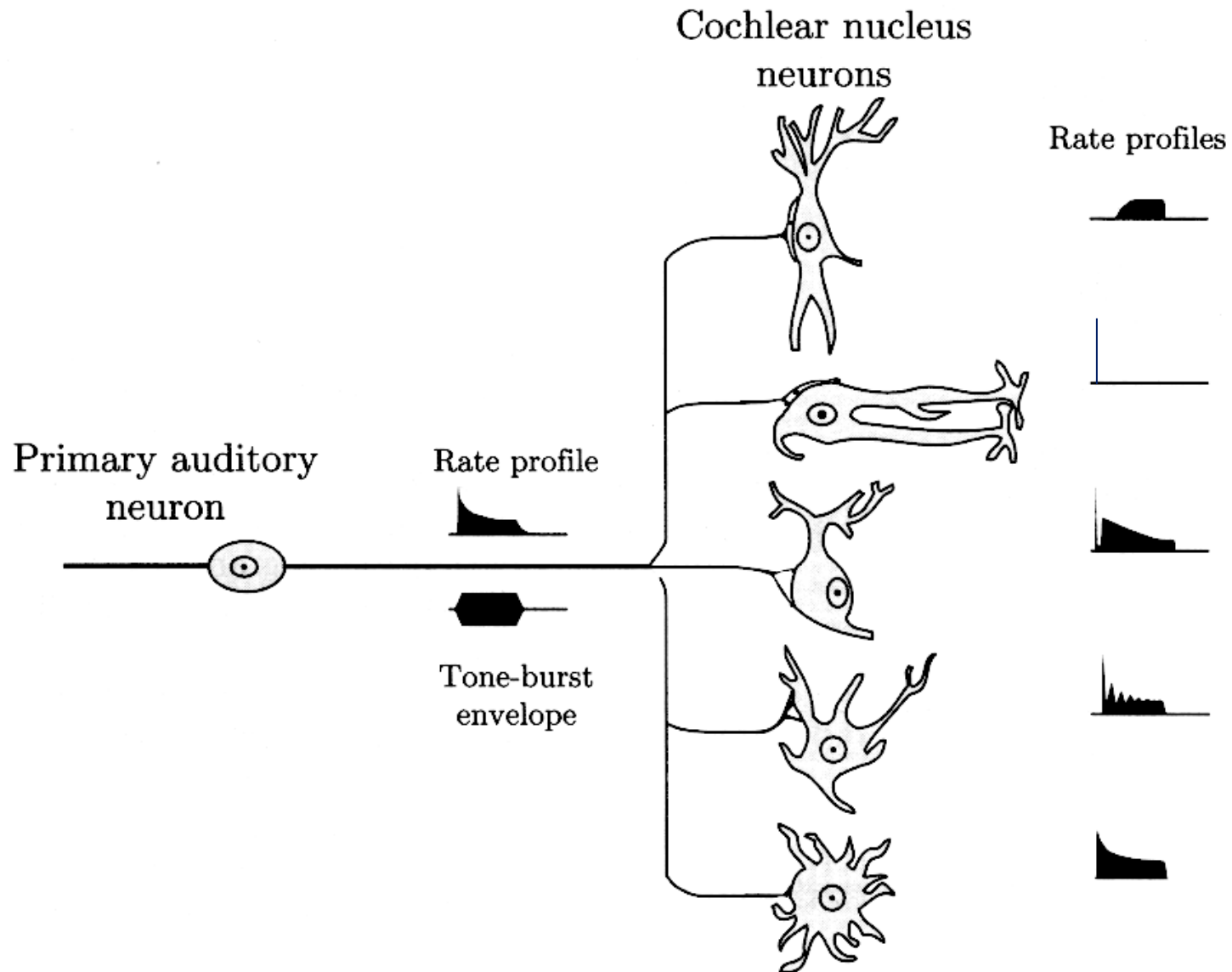


Die Hörbahn

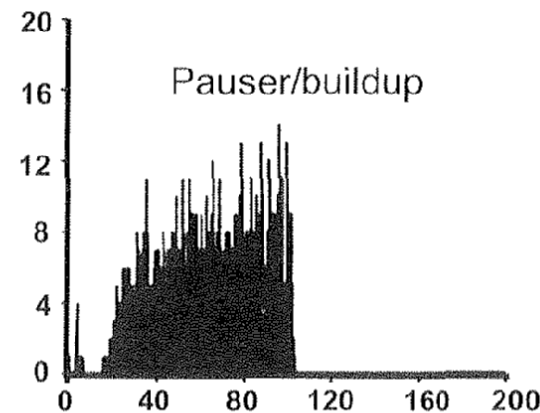
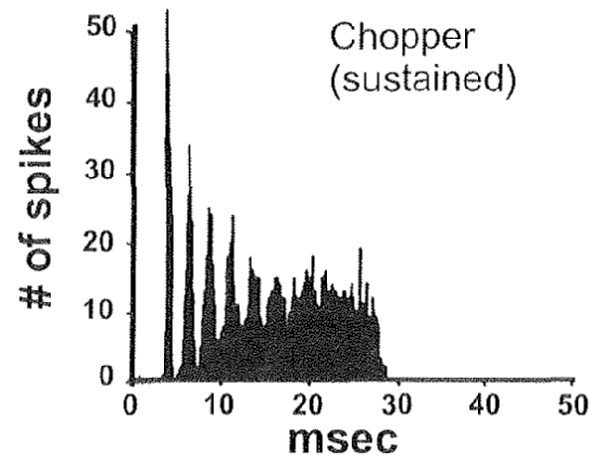
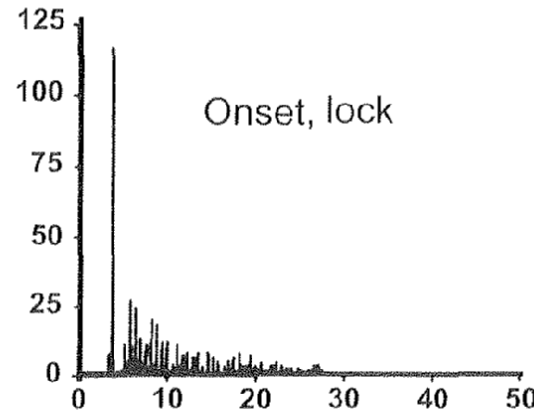
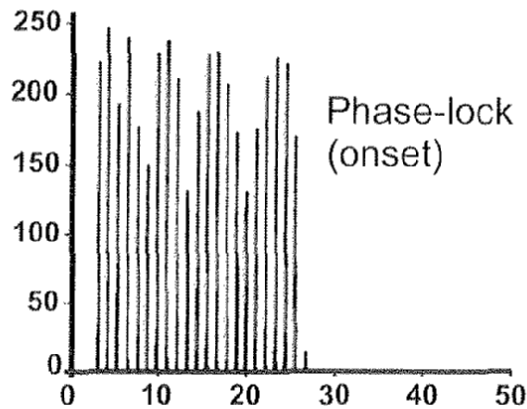
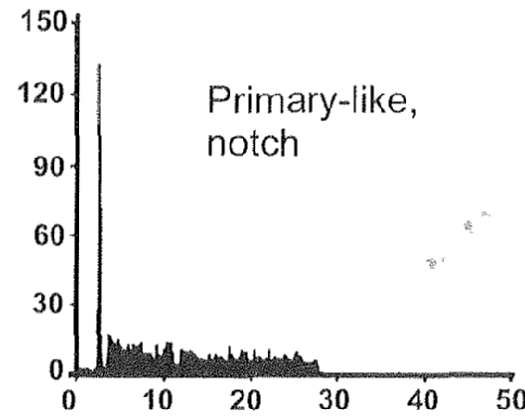
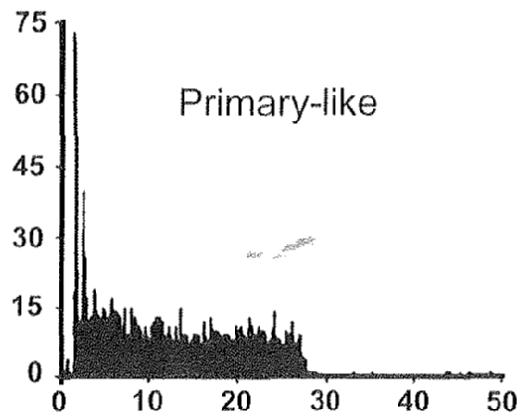
- ✓ Übersicht
- Hirnstamm
- Mittelhirn
- Zwischenhirn
- Kortex



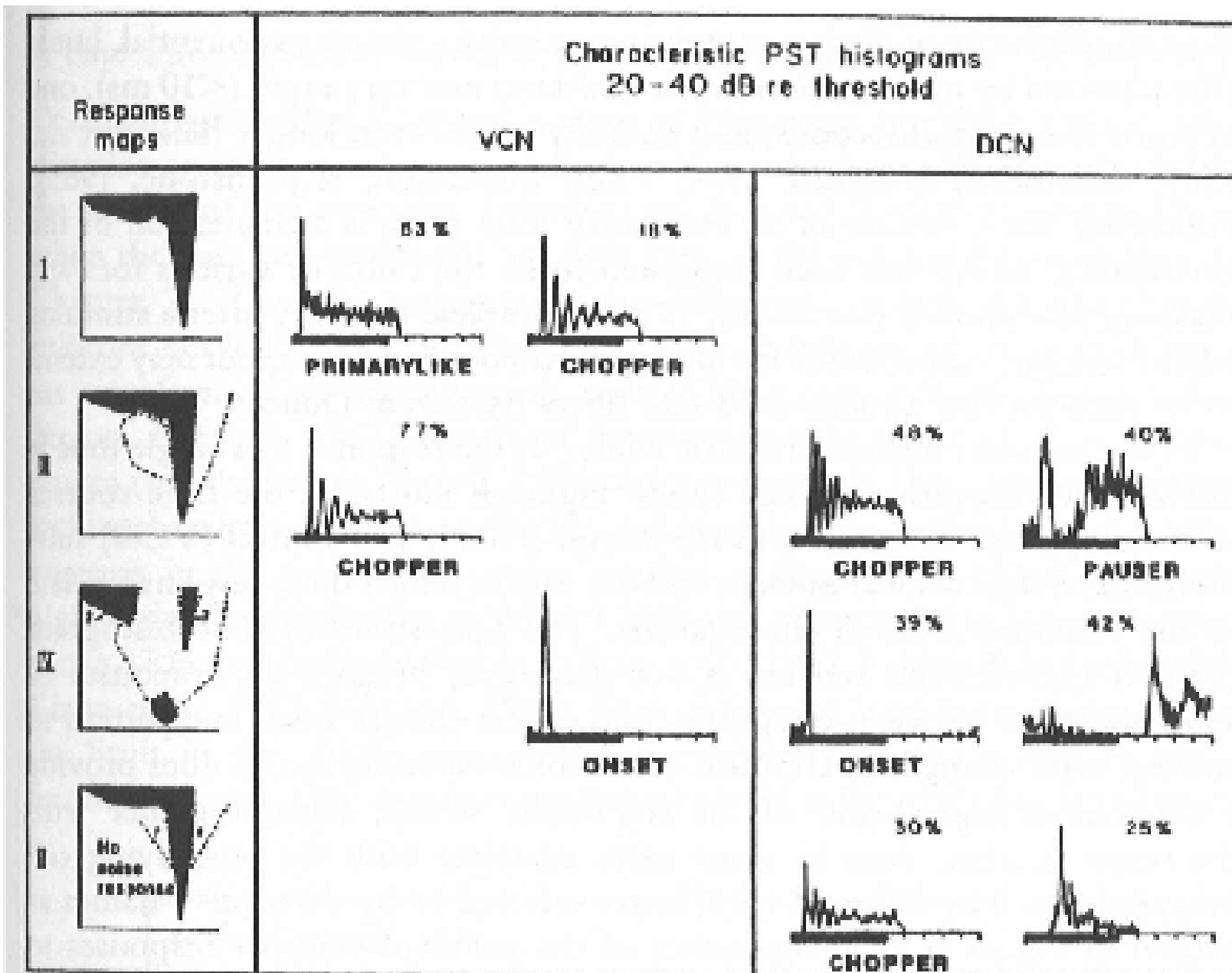
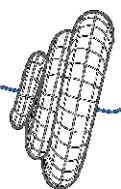




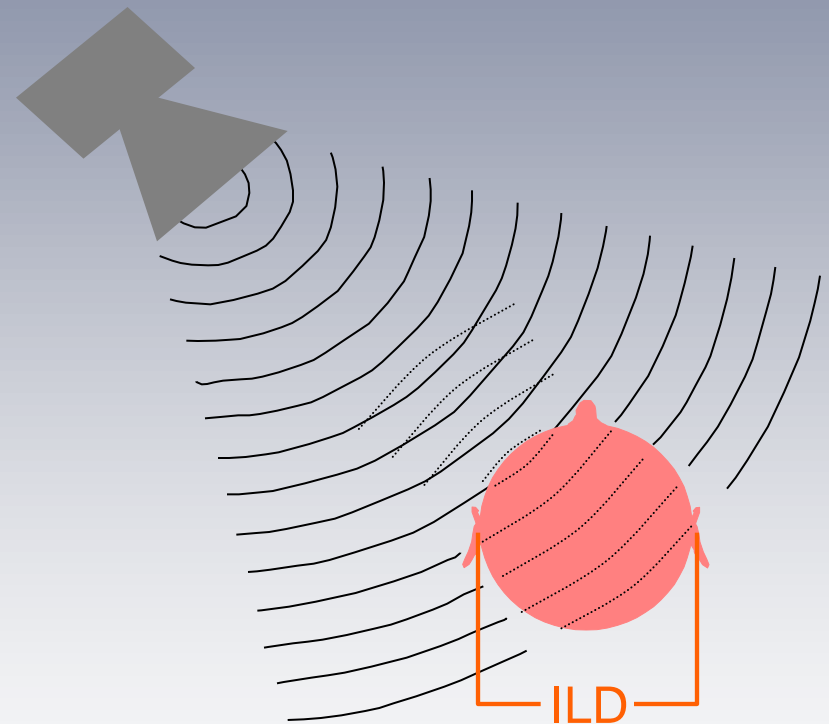
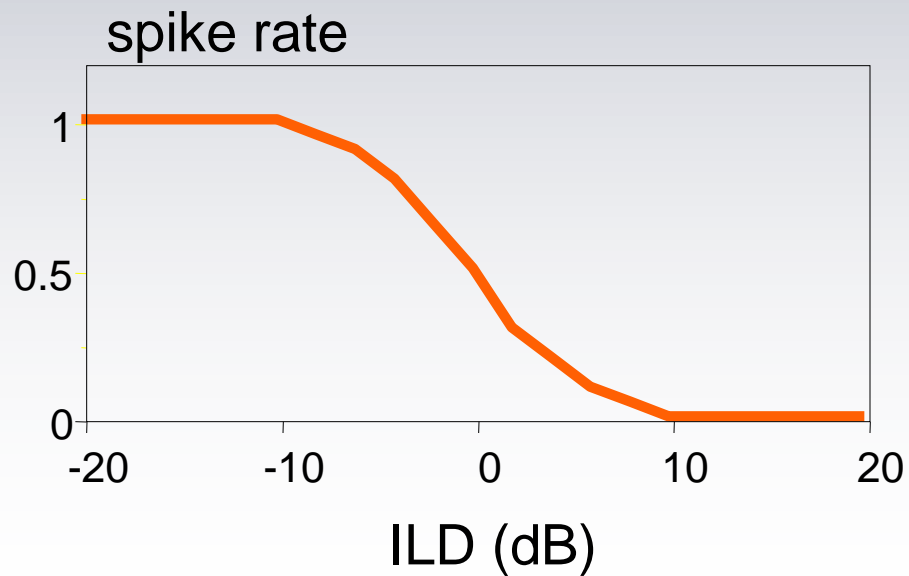
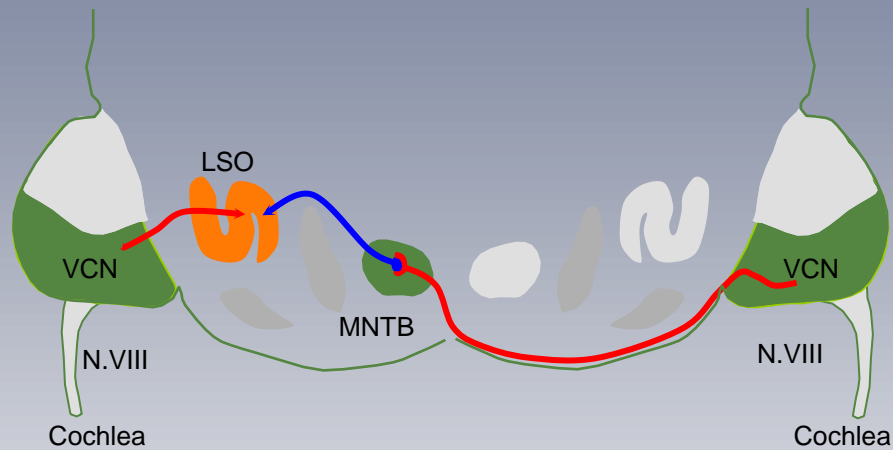
Neurone im auditorischen Hirnstamm



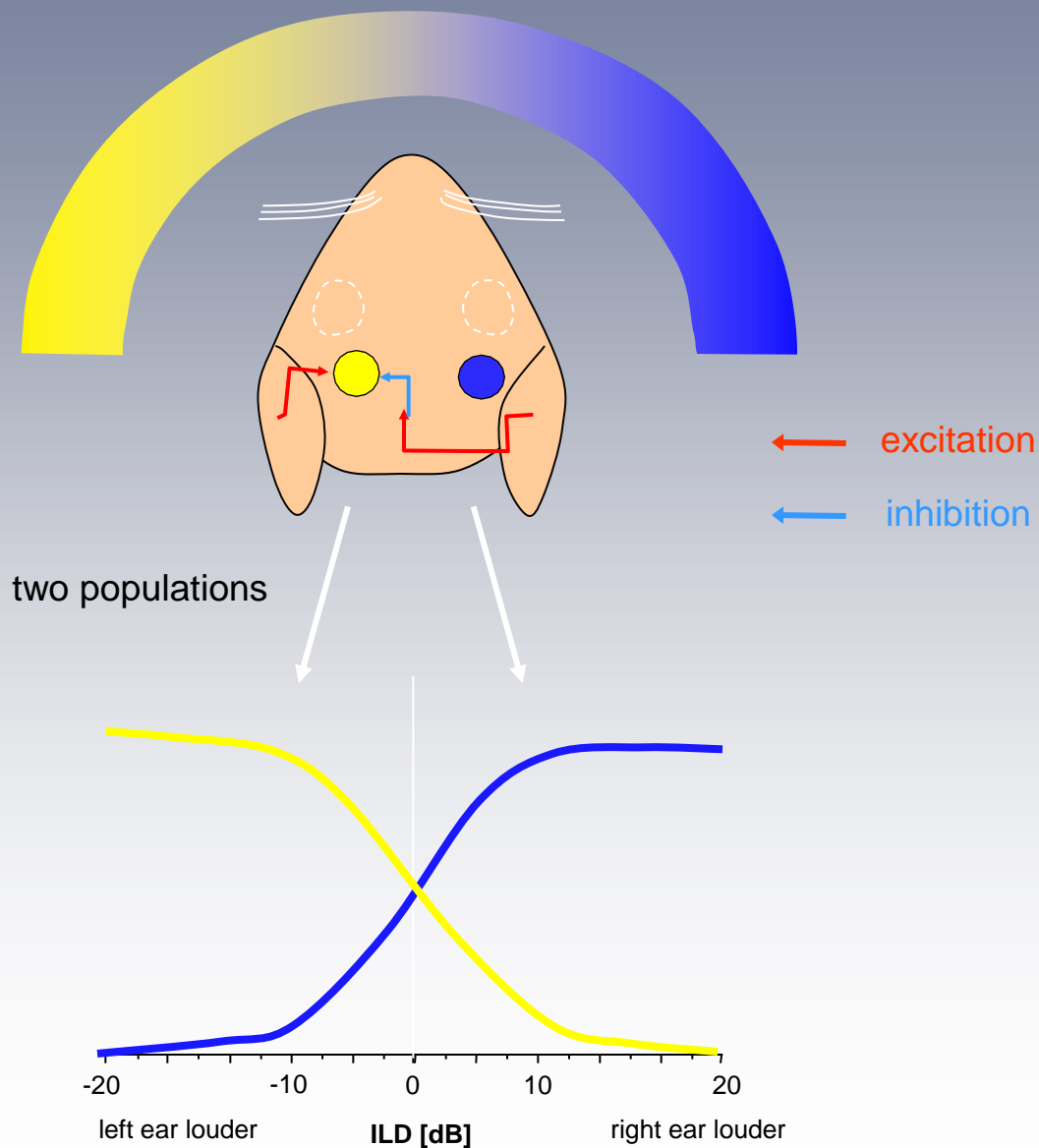
Integrative Functions in the Mammalian Auditory Pathway (Eds.: Oertel, Fay, Popper, Springer)



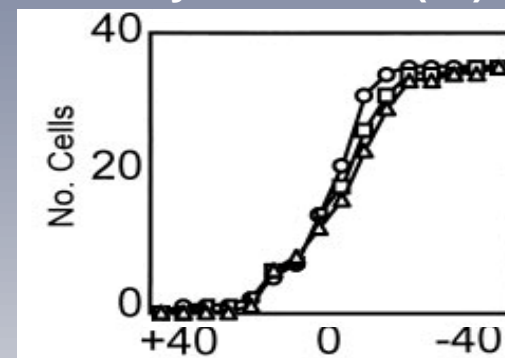
ILD coding in the LSO



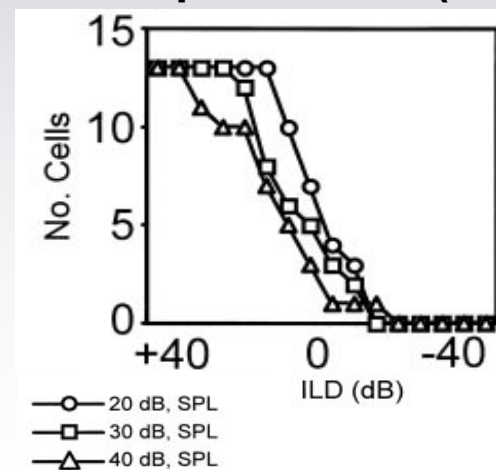
Representation of ILDs



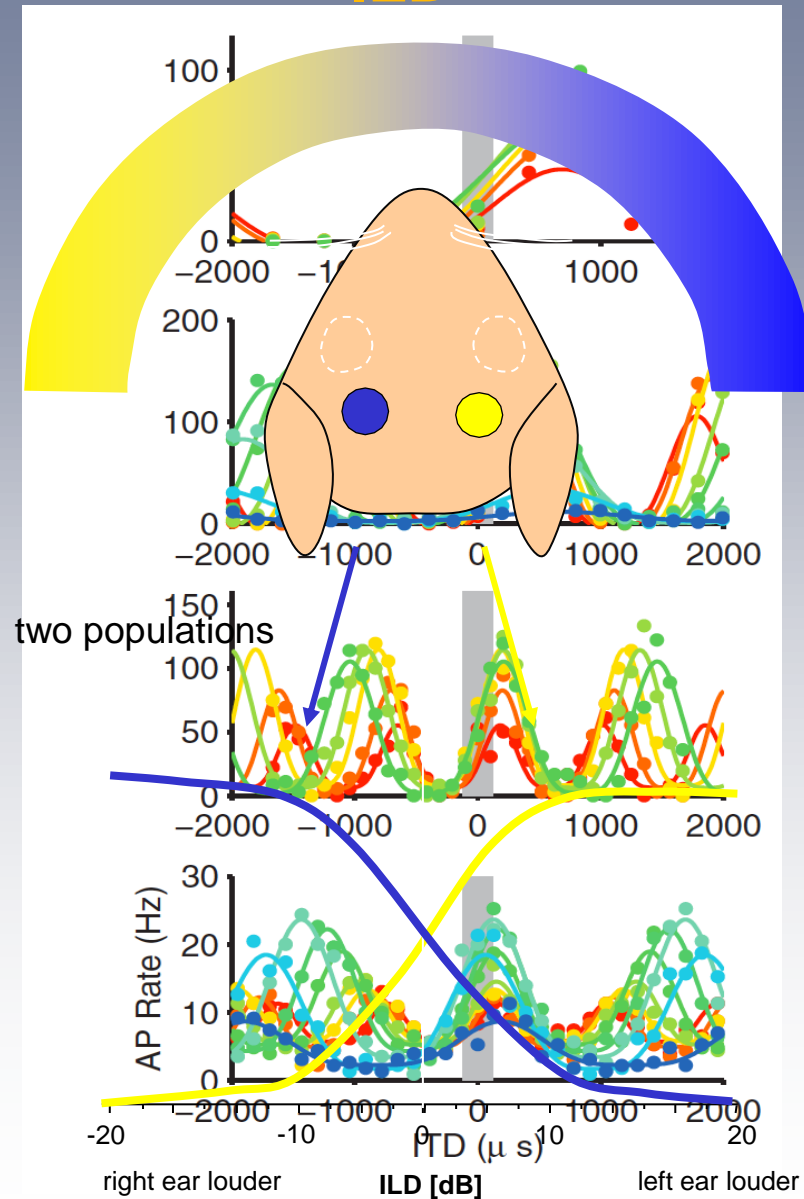
Auditory midbrain (IC)



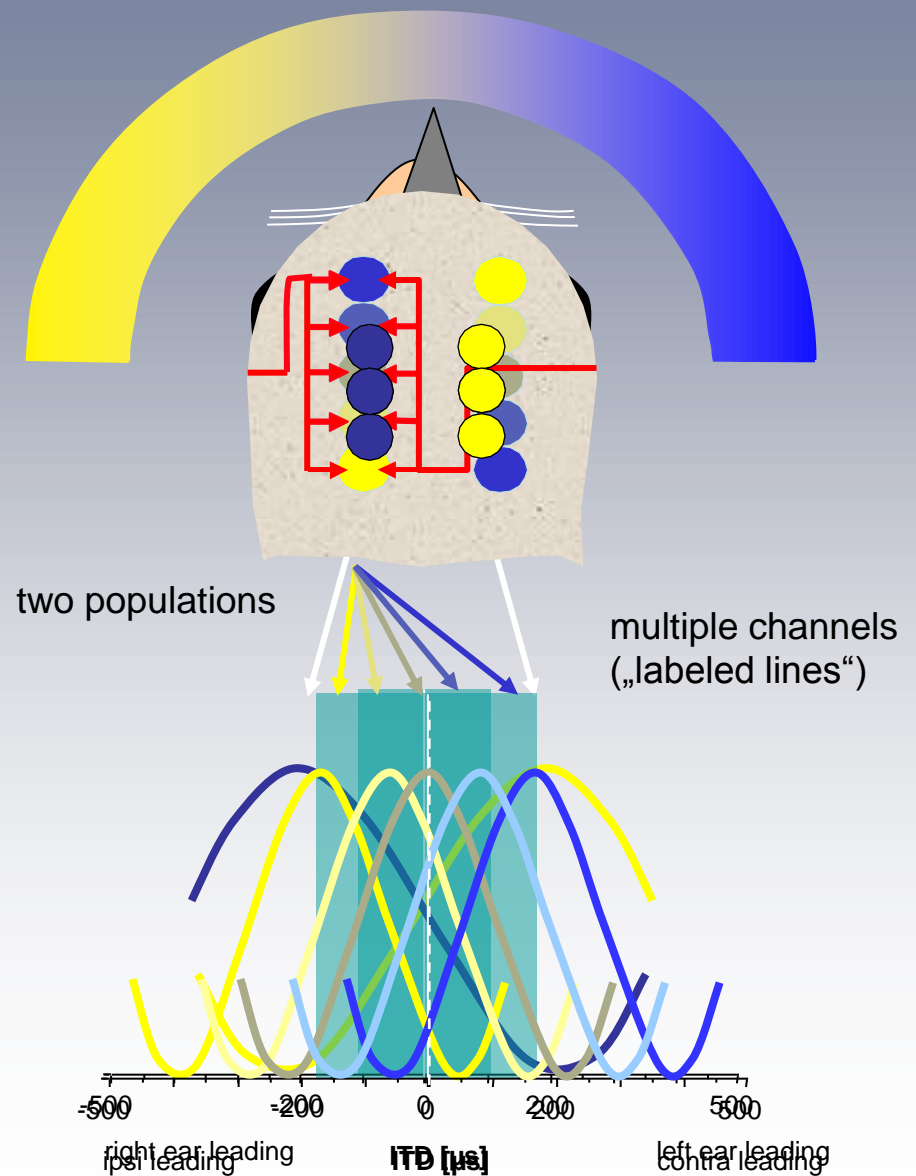
Lateral superior olive (LSO)

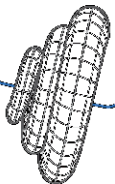


ILD

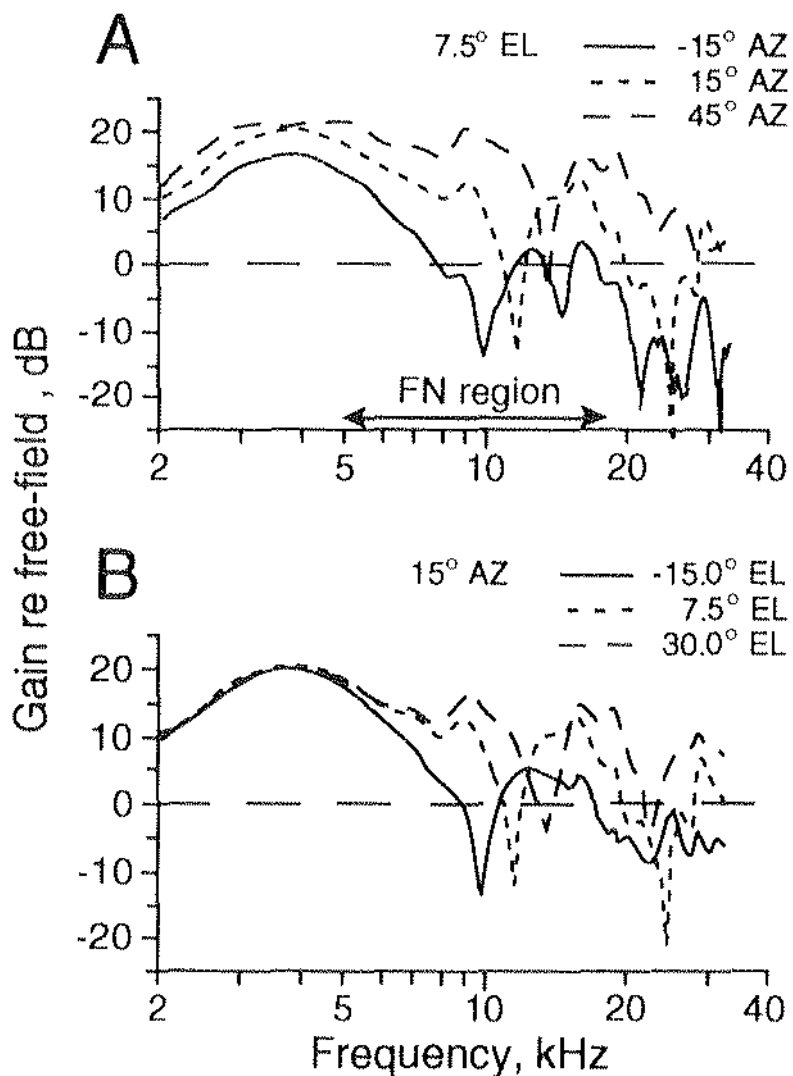


ITD

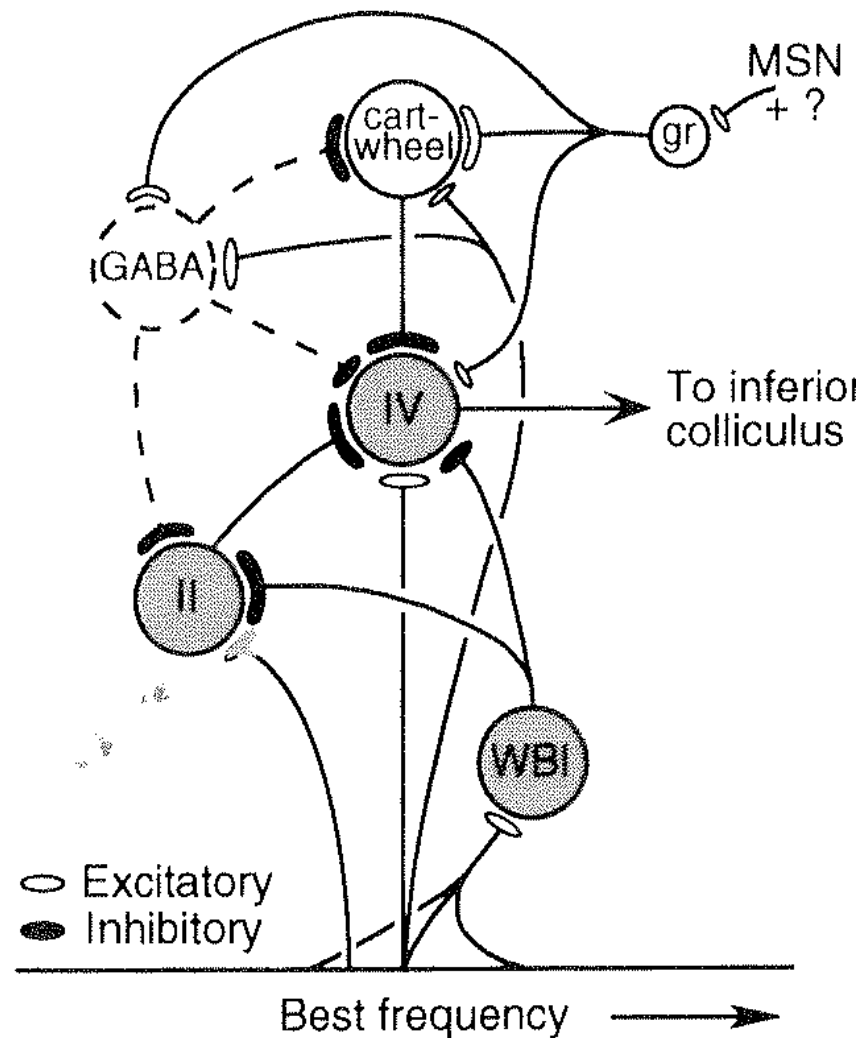


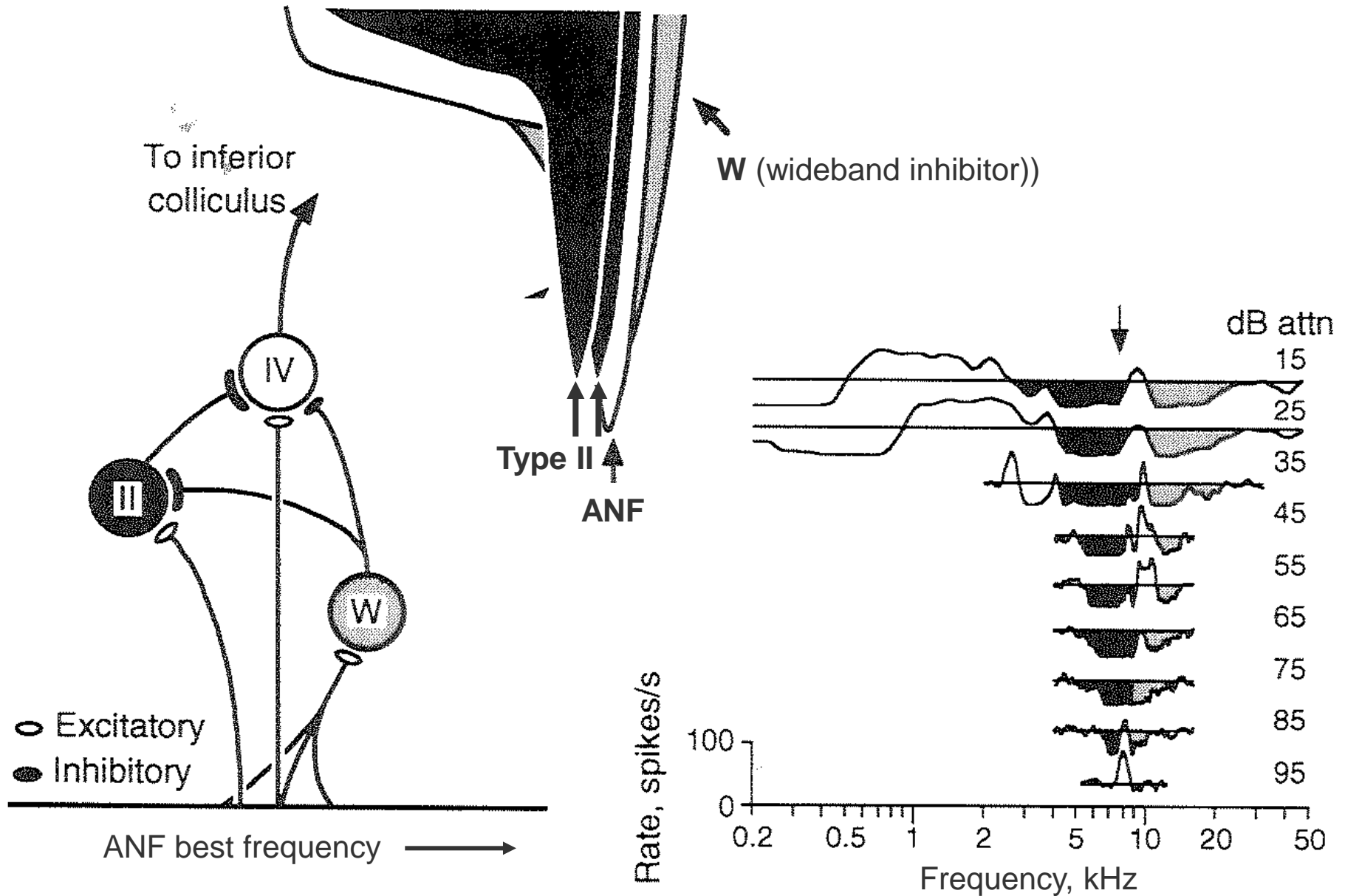
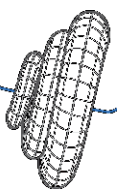


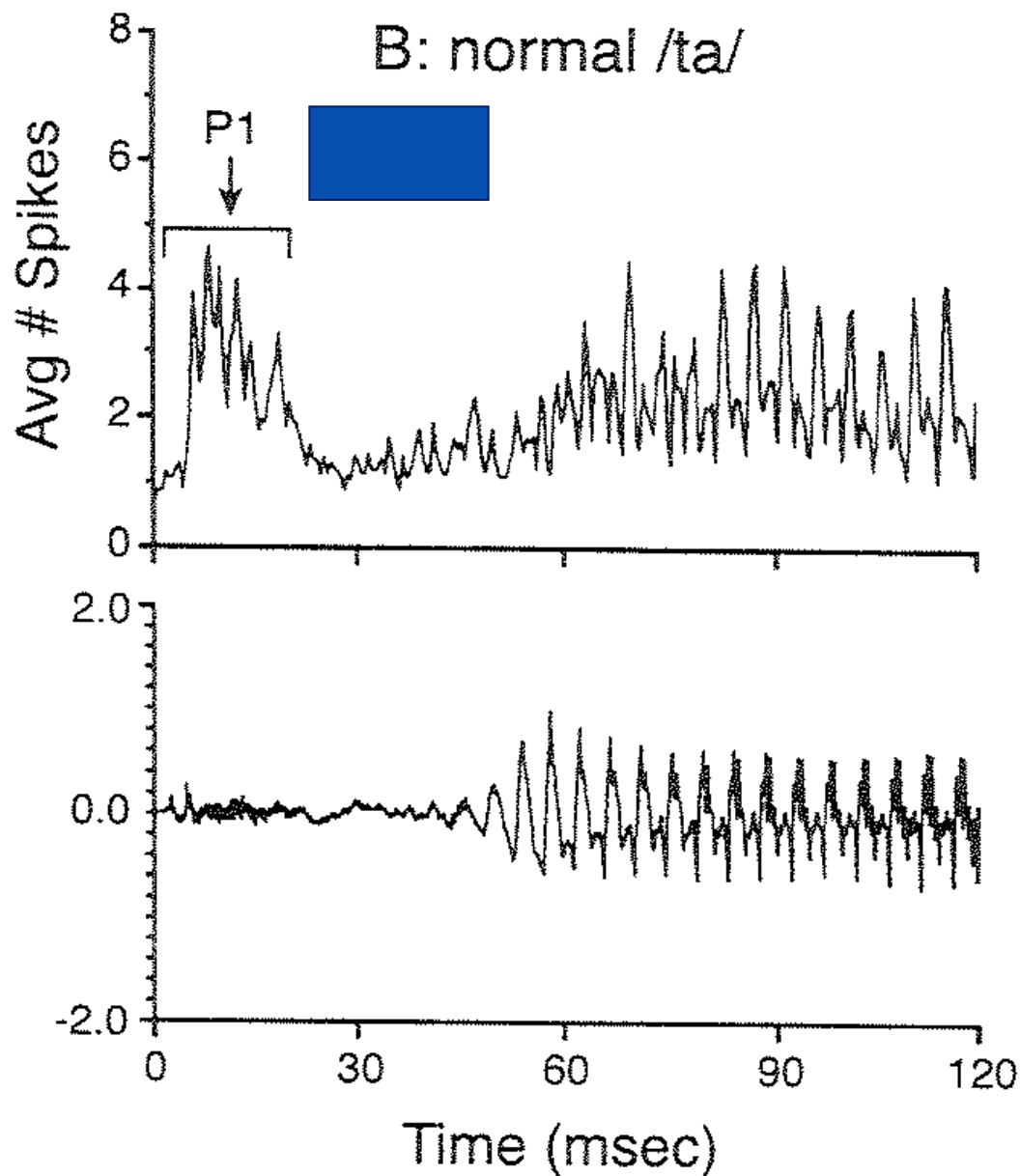
Cat HRTF



DCN Circuit diagram



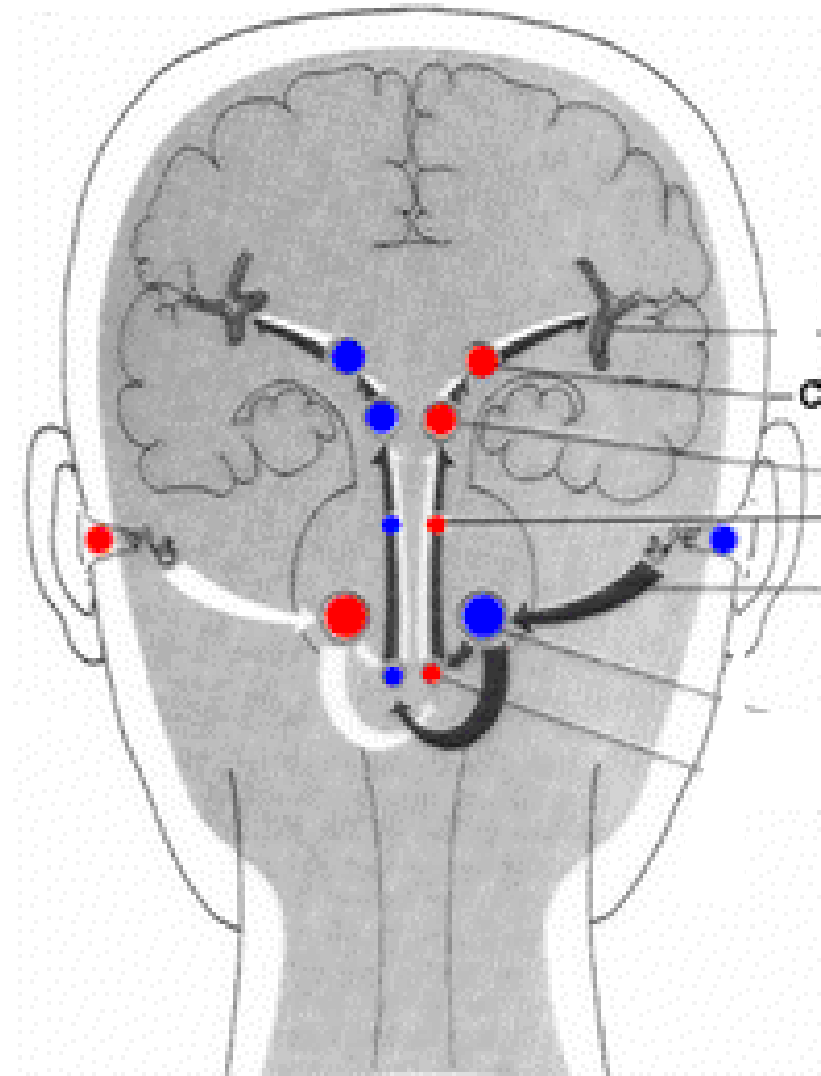


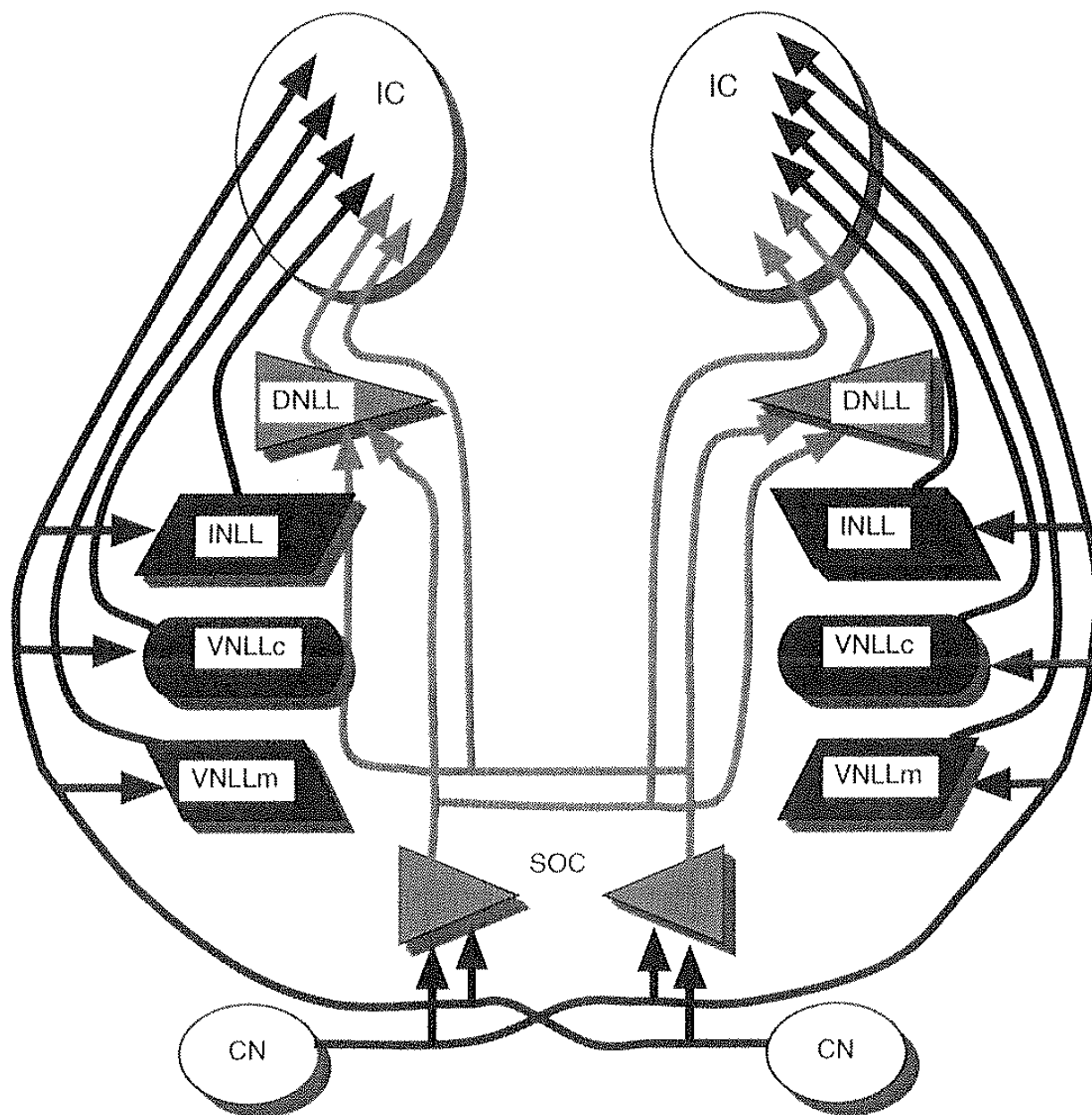
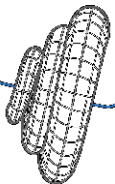


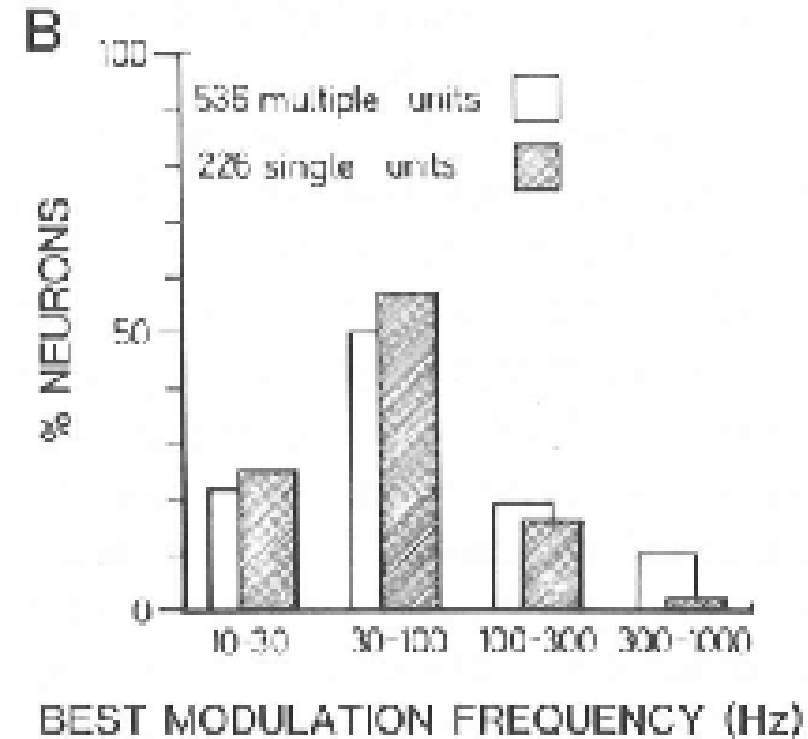
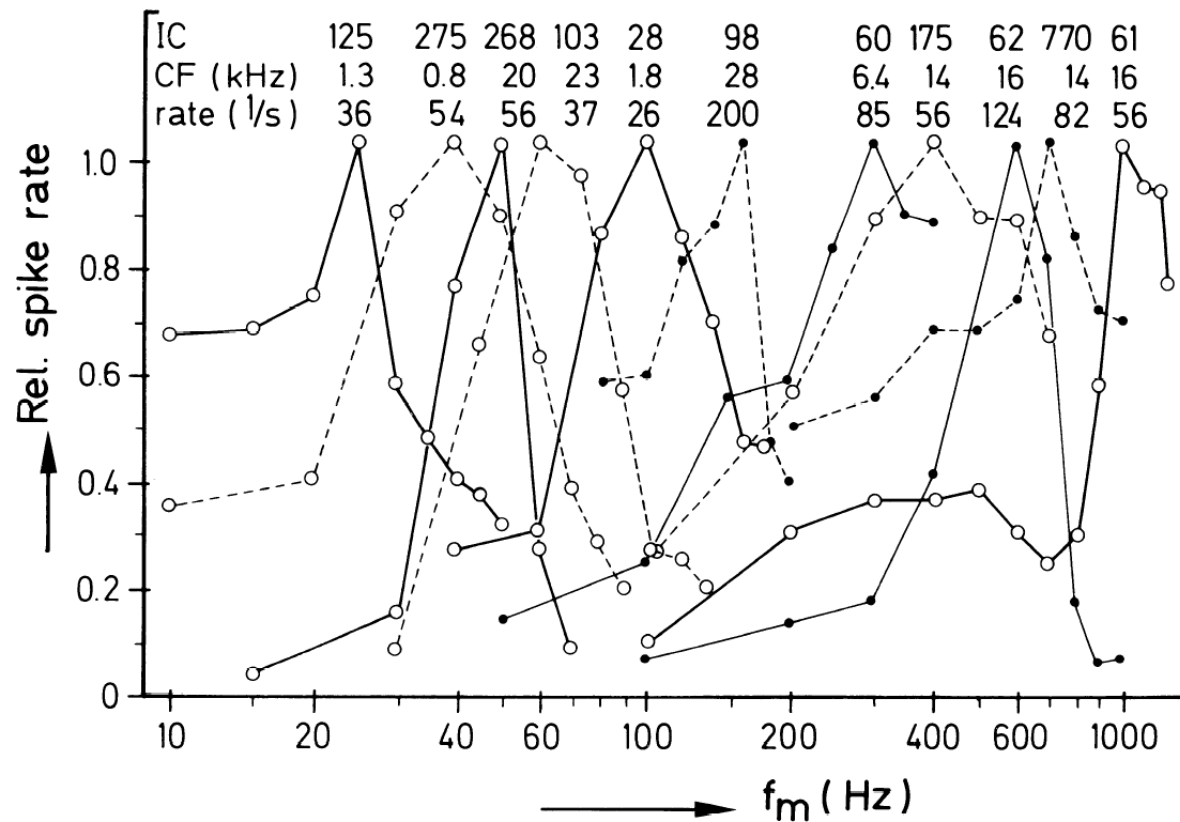
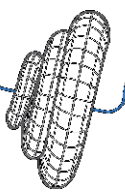
Gap detection?

Die Hörbahn

- ✓ Übersicht
- ✓ Hirnstamm
- Mittelhirn
- Zwischenhirn
- Kortex

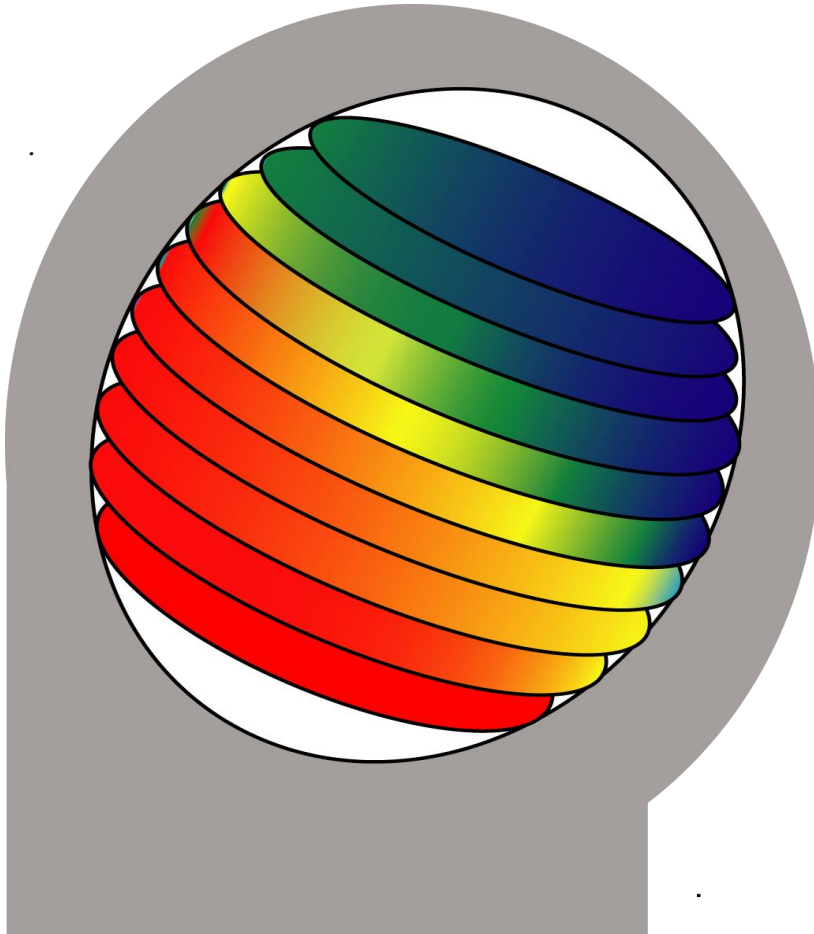




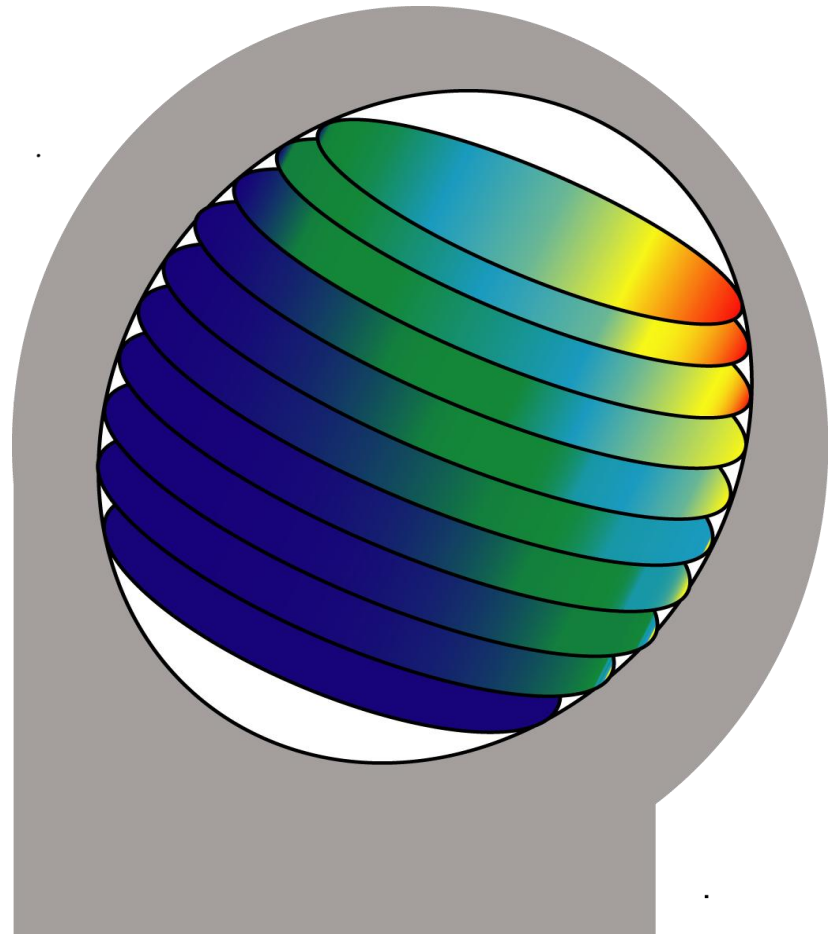


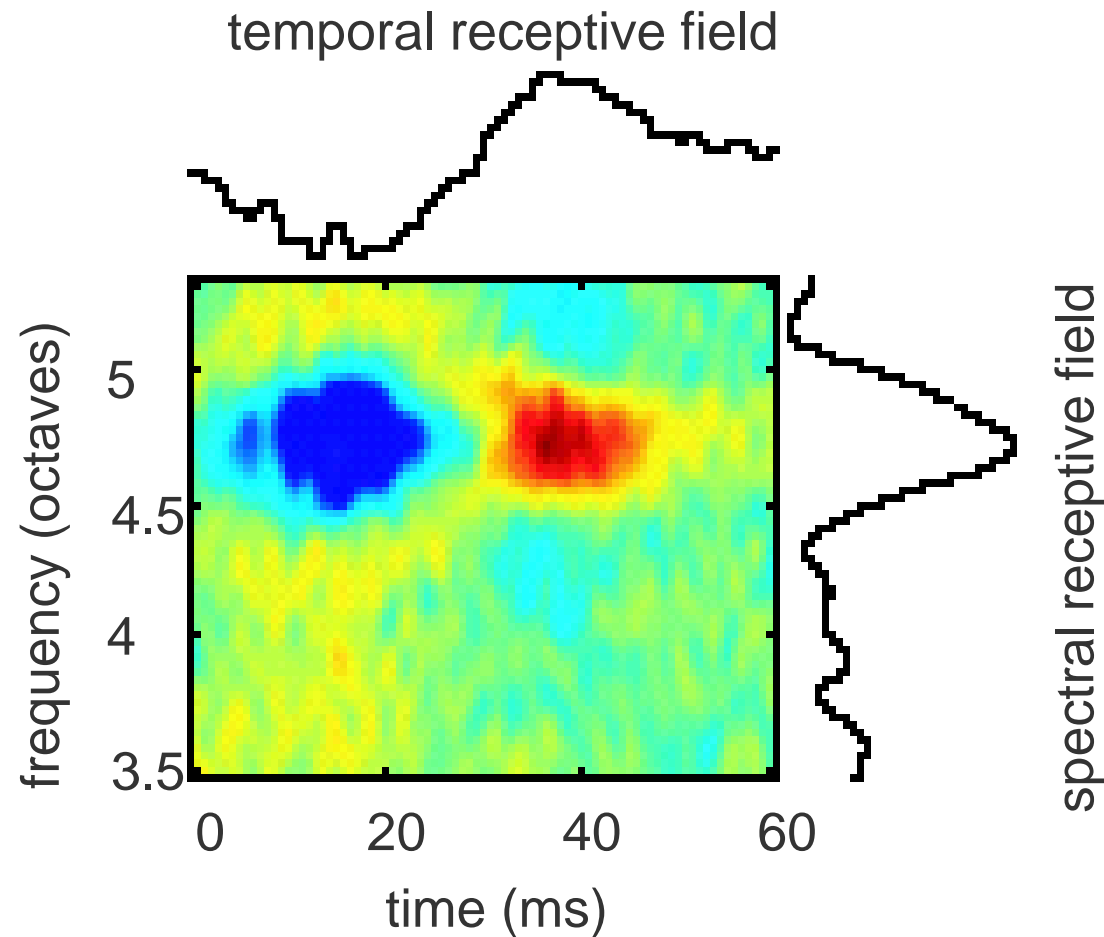
Model organization of the Central Nucleus

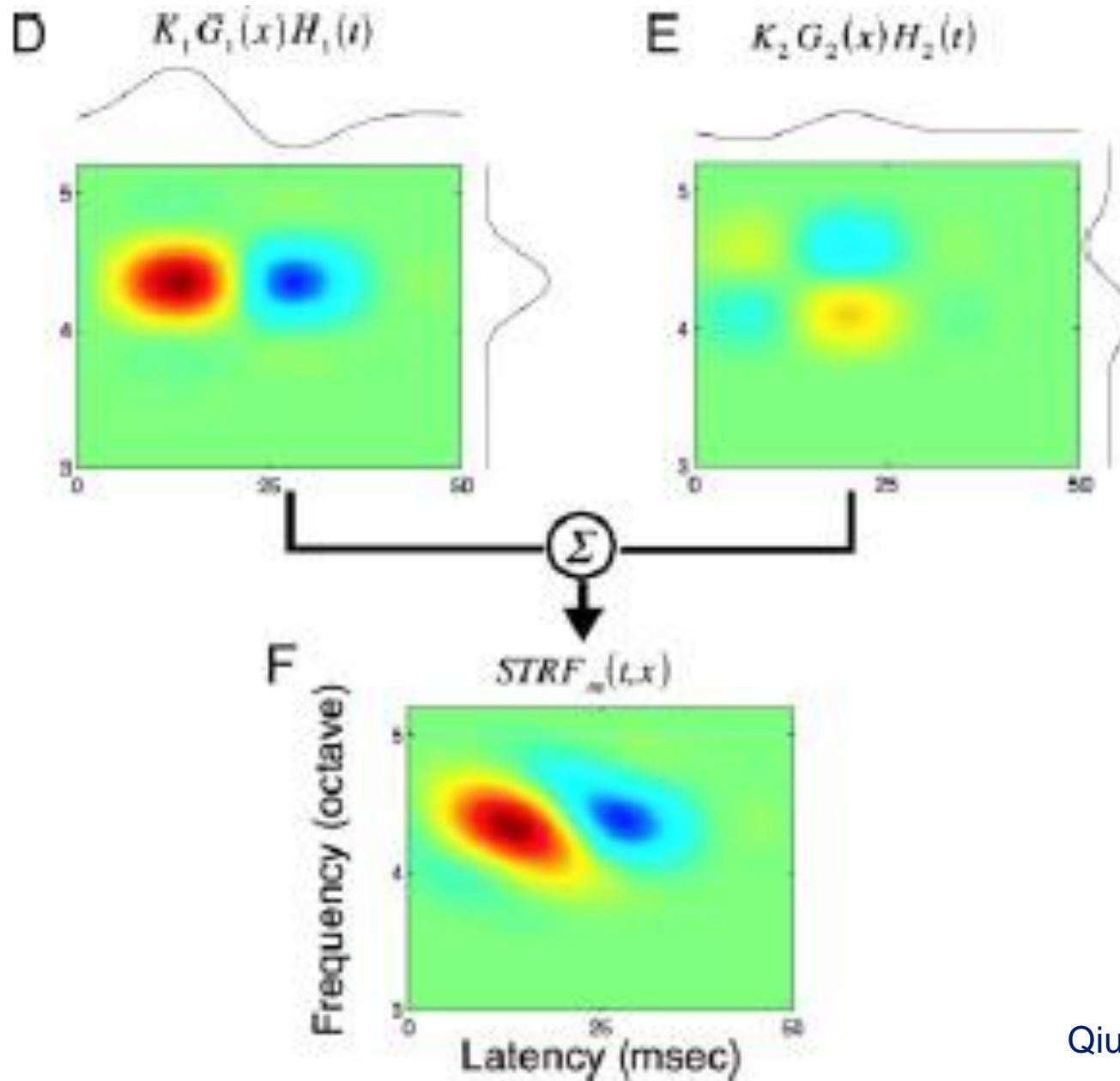
Spectral Resolution

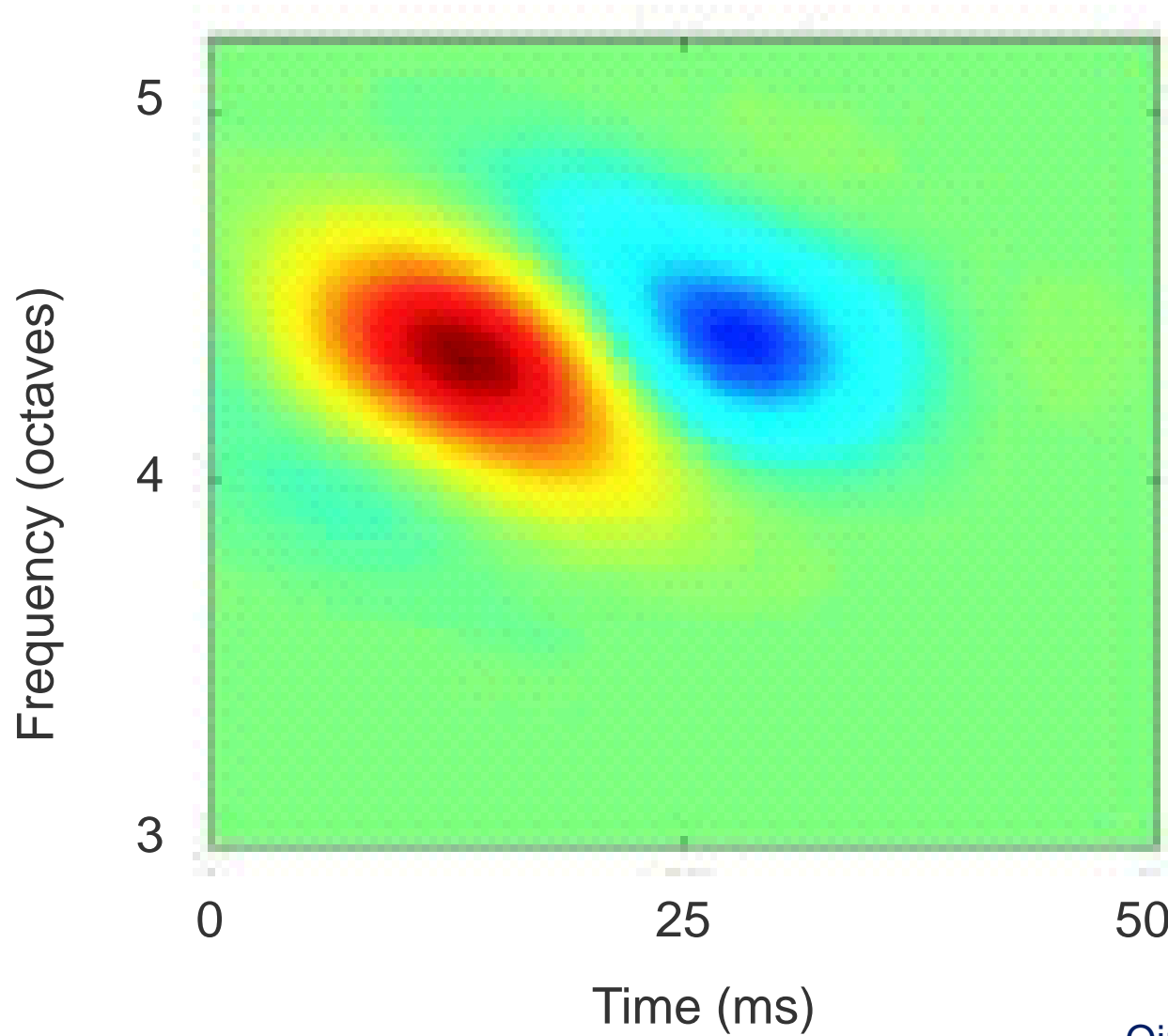


Temporal Resolution

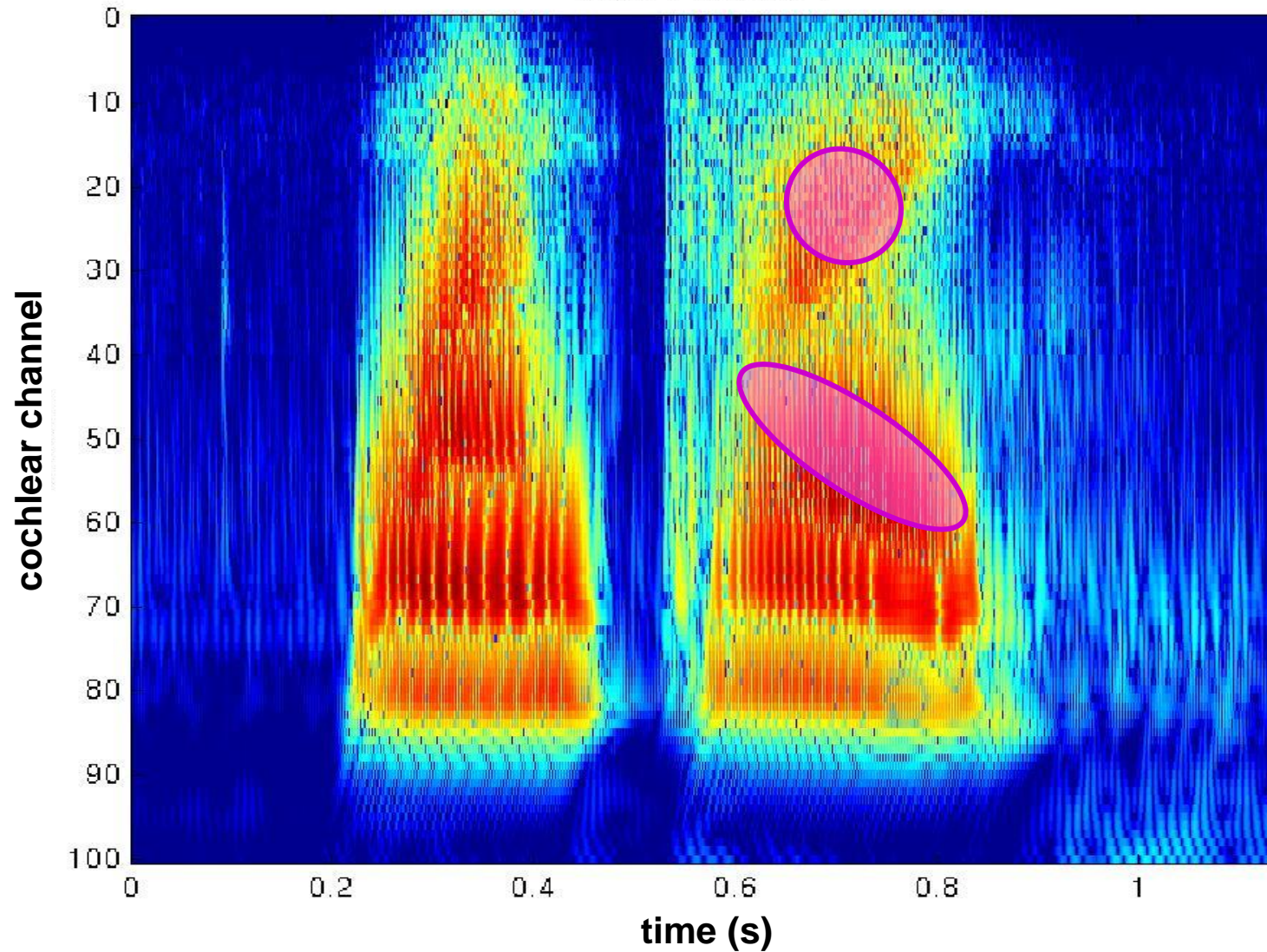






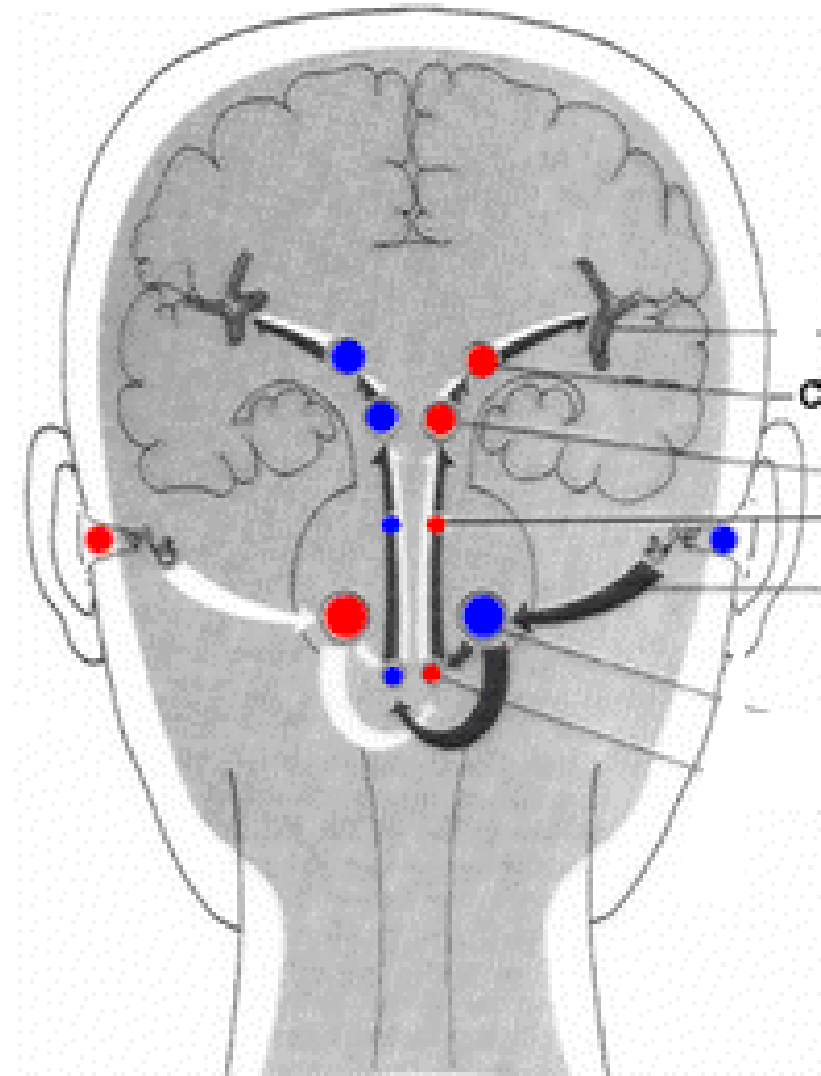


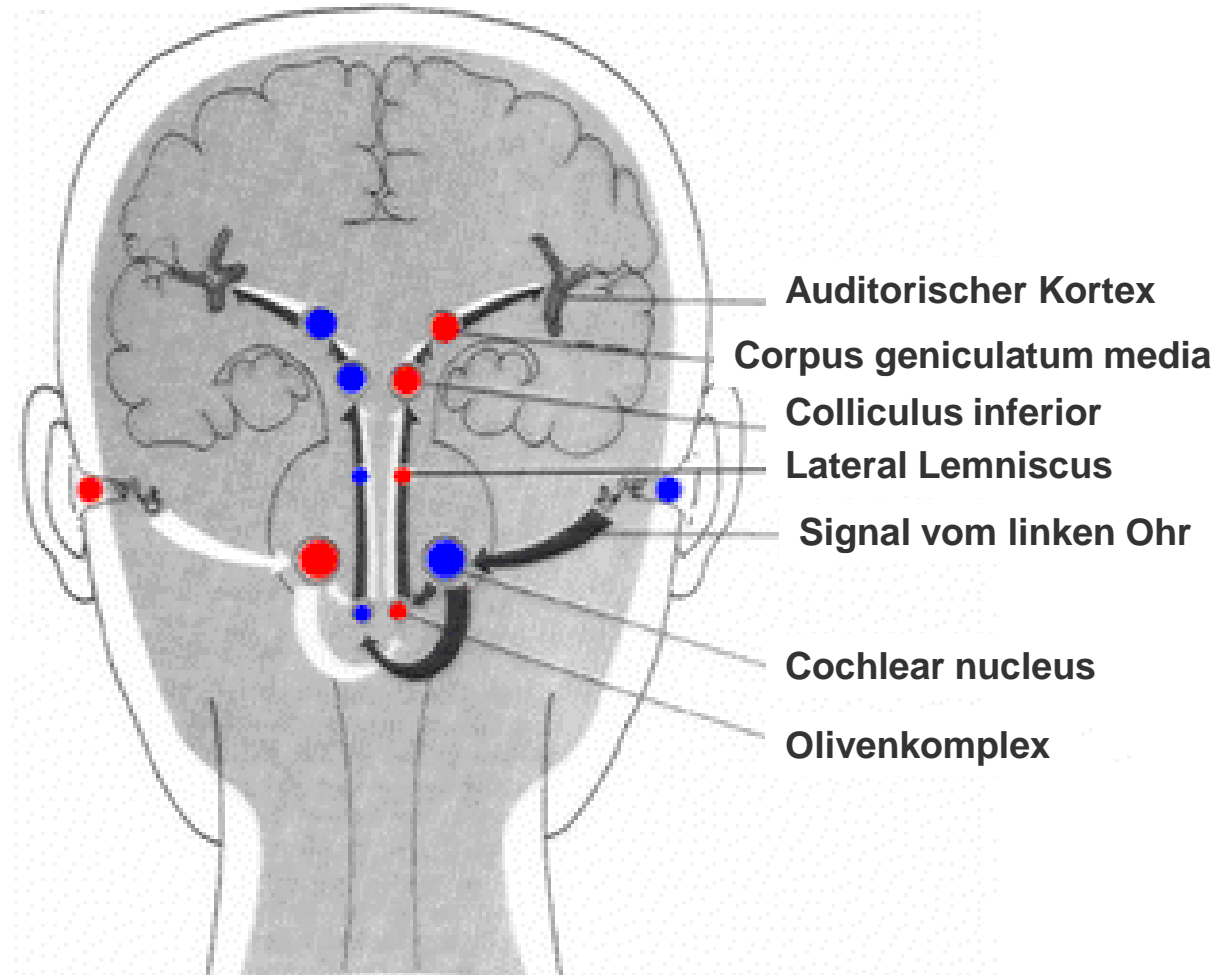
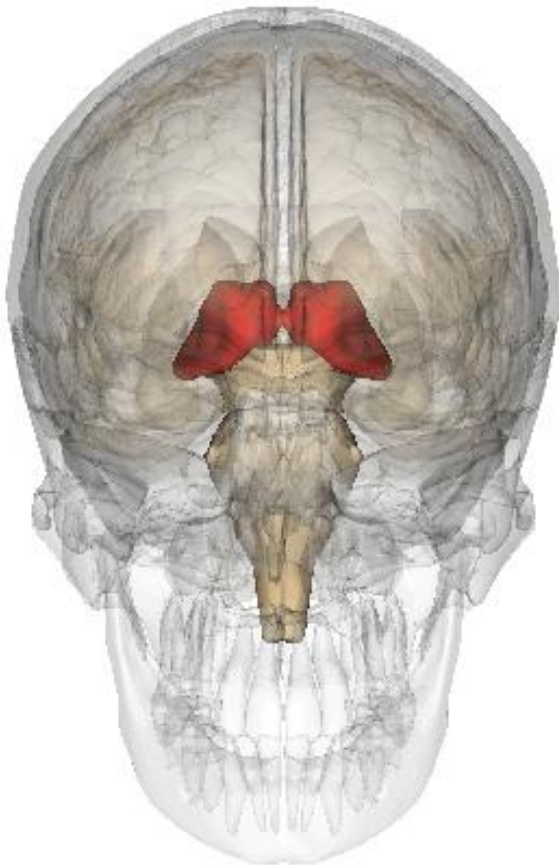
Spectrogram (BM) "one three"

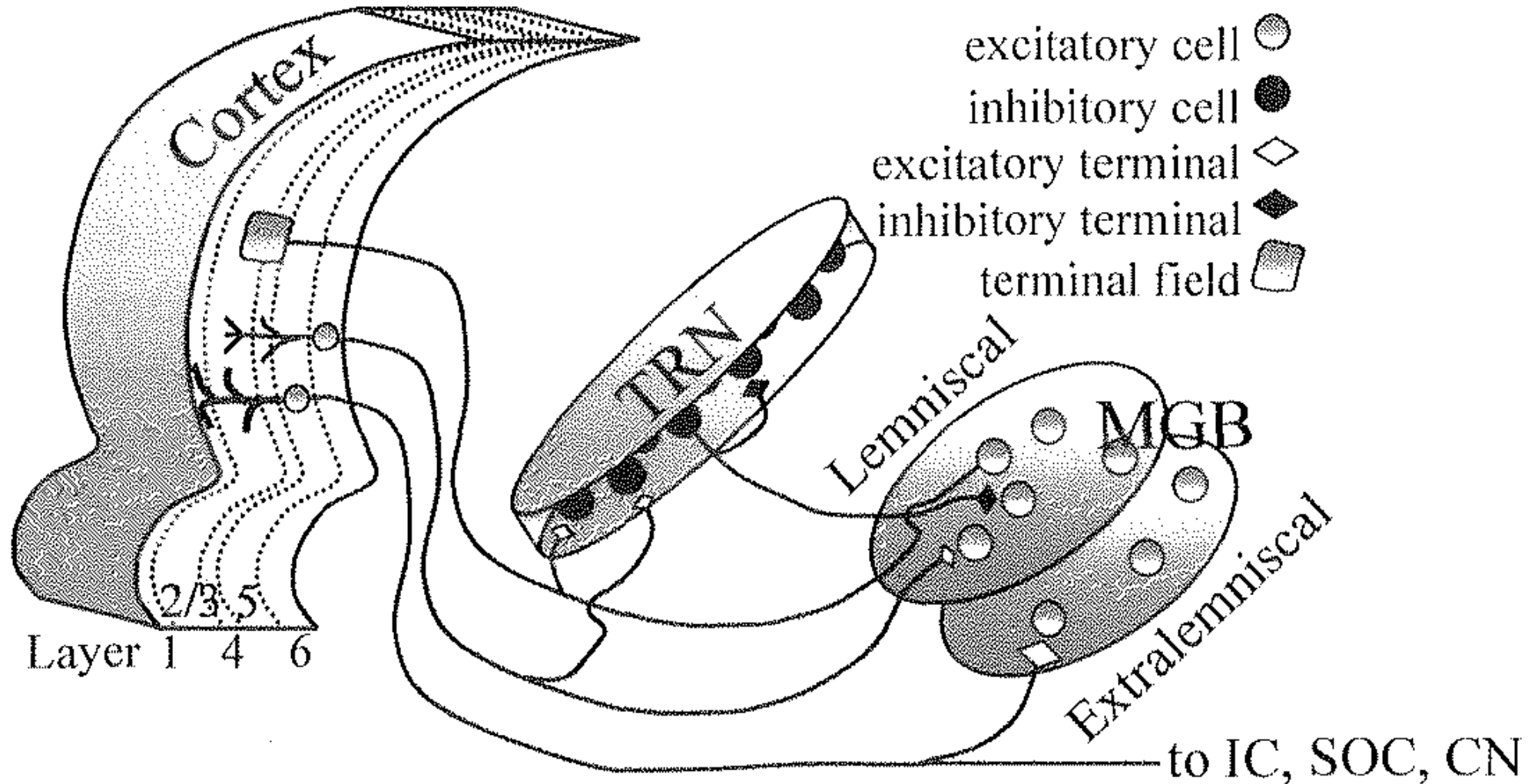
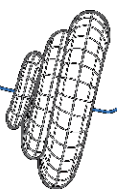


Die Hörbahn

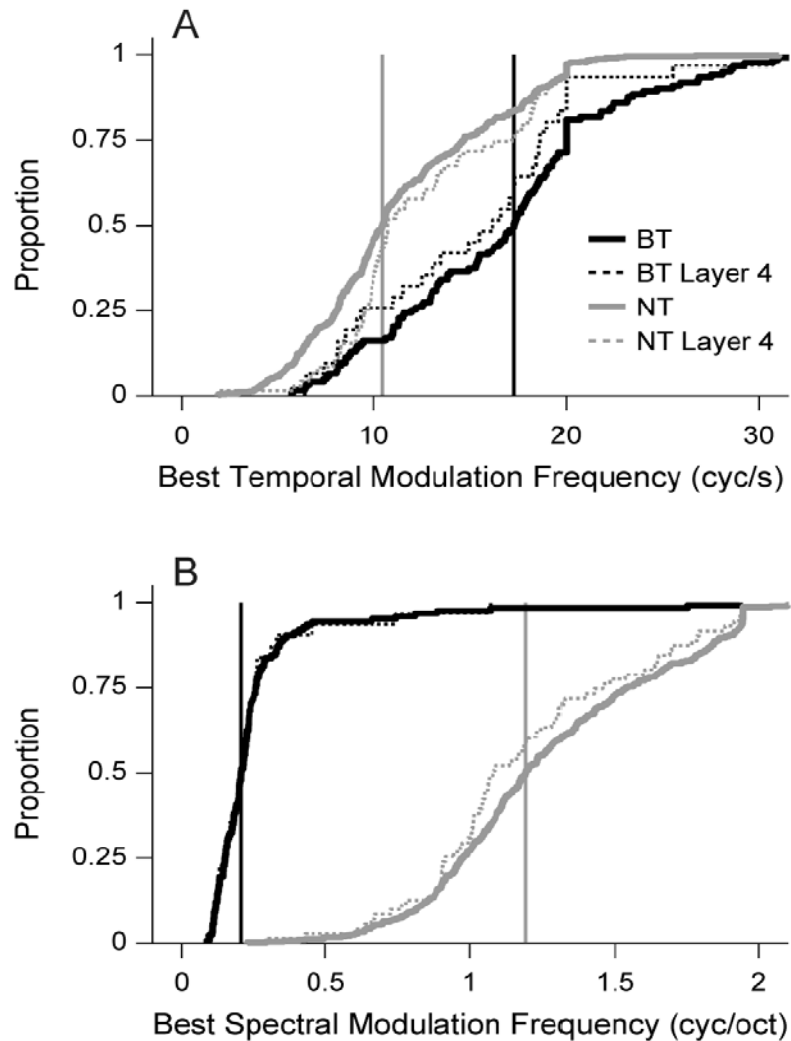
- ✓ Übersicht
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- Zwischenhirn
- Kortex



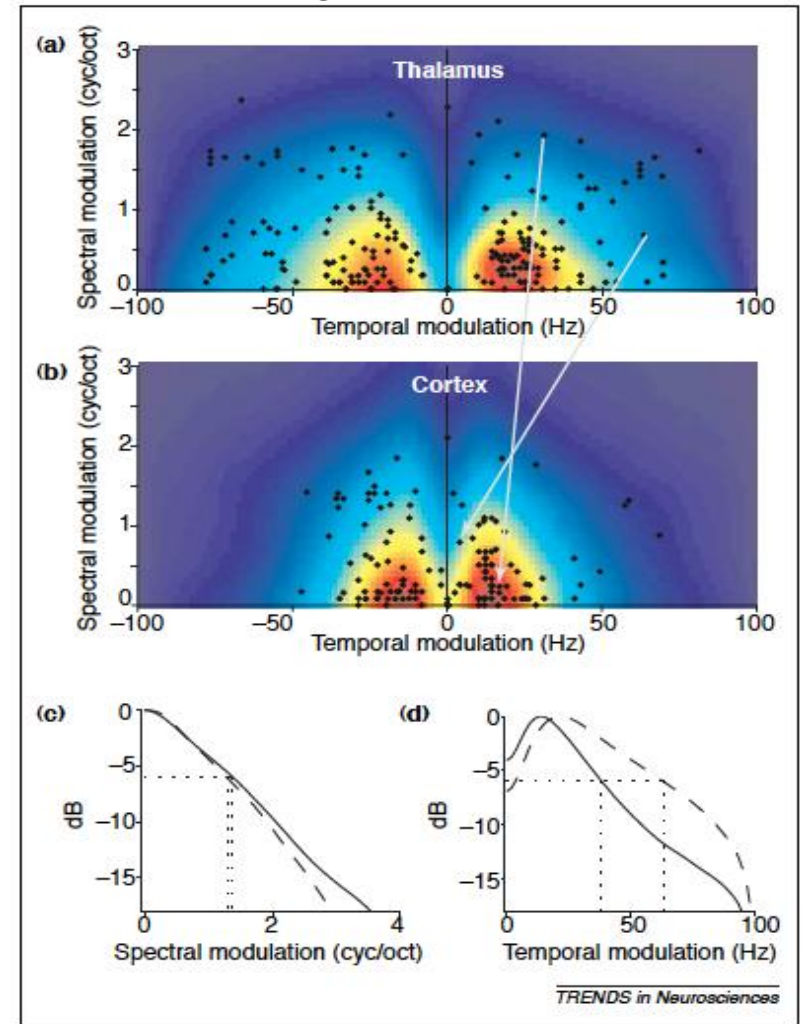




Trade-off in temporal tuning Between broad and narrow A1-regions



Pair-wise recordings of thal&AC neurons

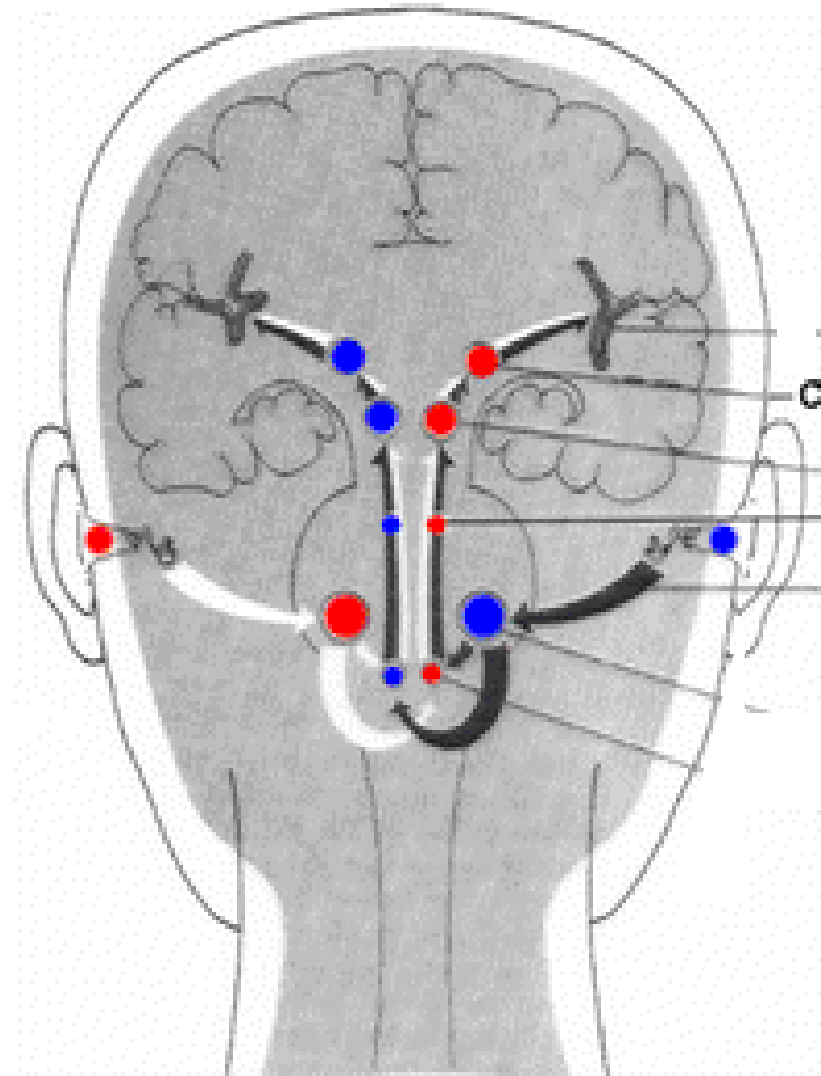


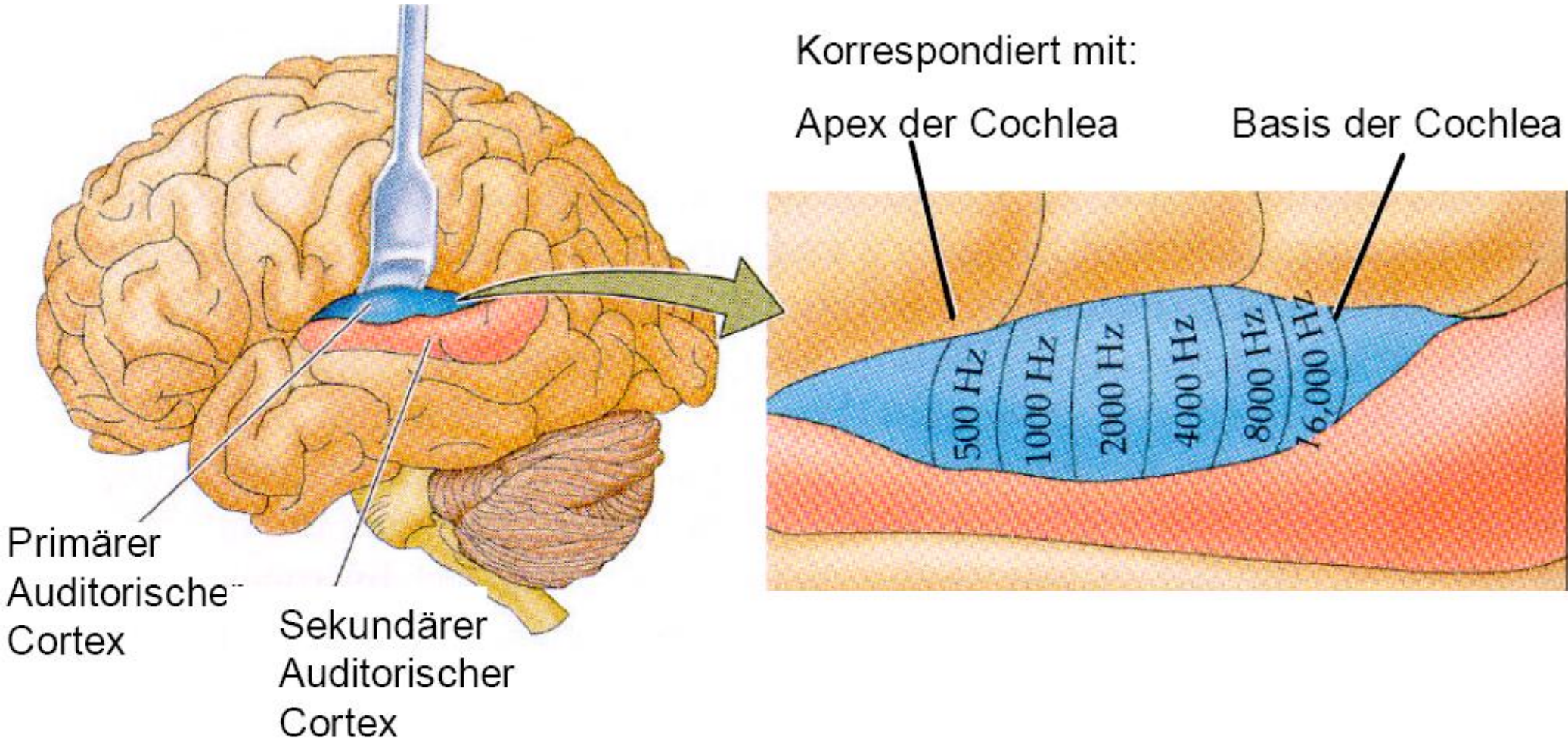
- Reduction of tMTF range between thalamus and AC
- No difference for sMTFs-

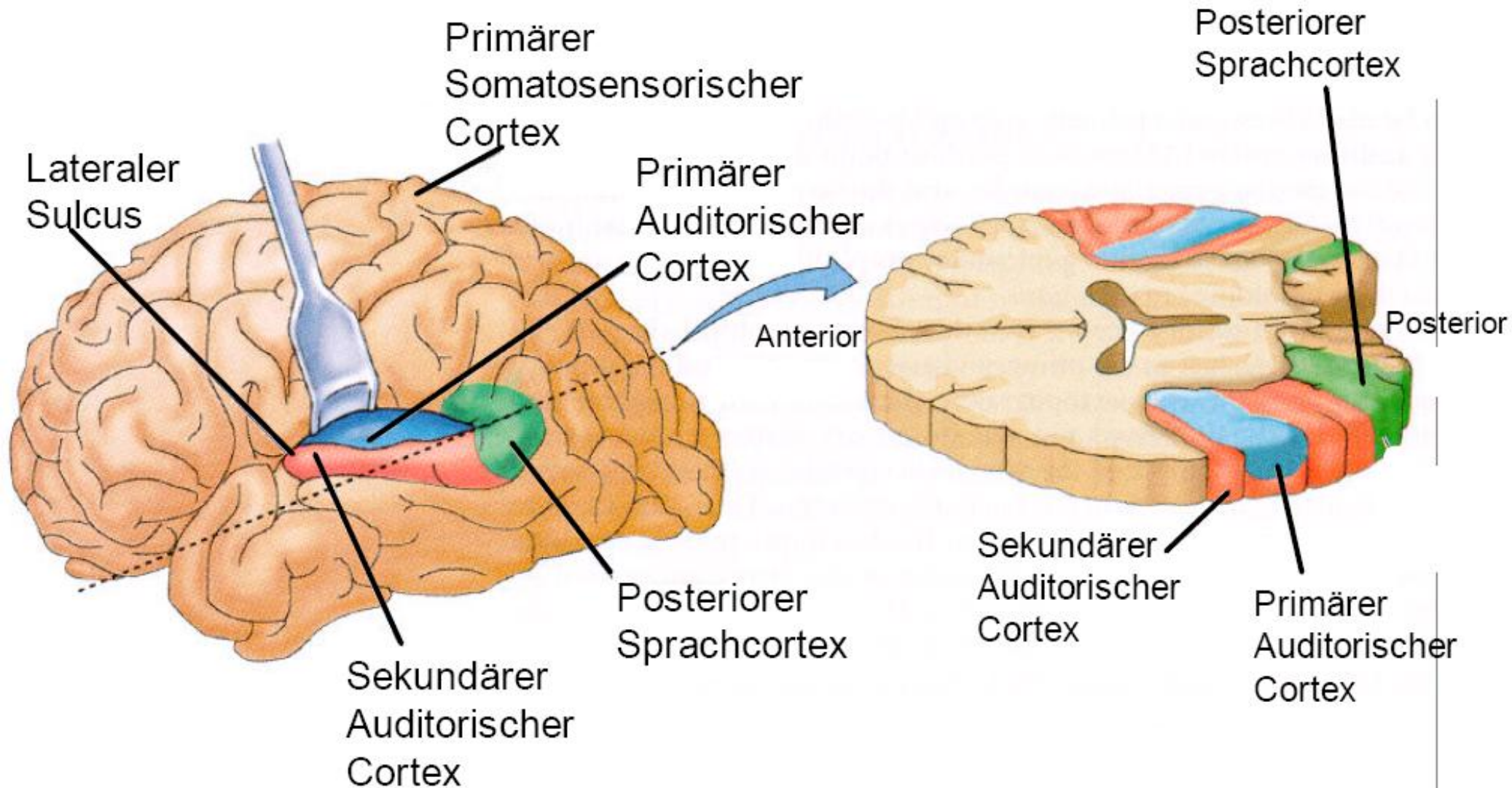
(Miller et al., 2003)

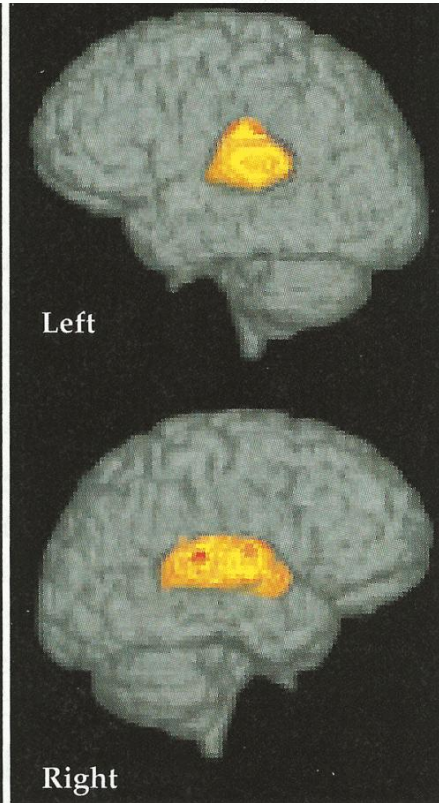
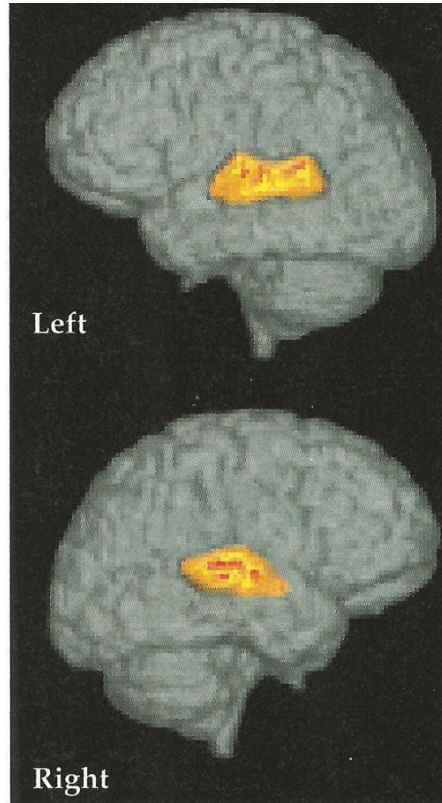
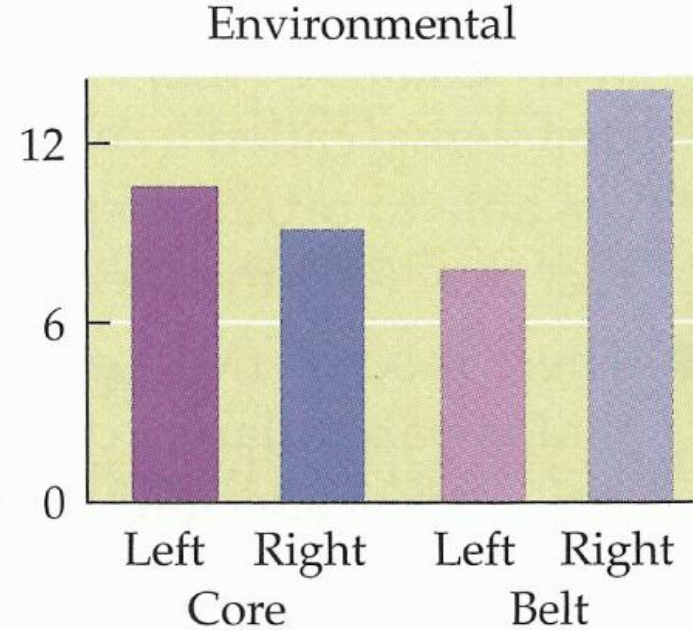
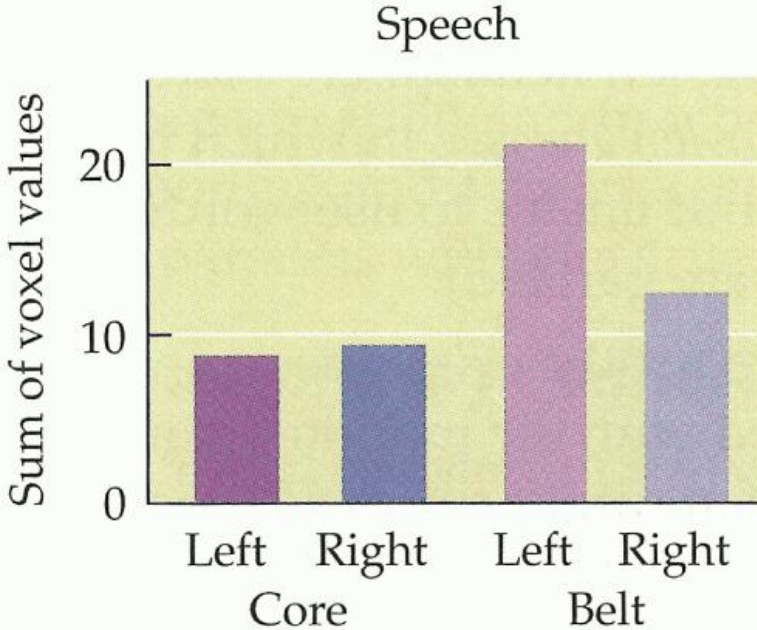
Die Hörbahn

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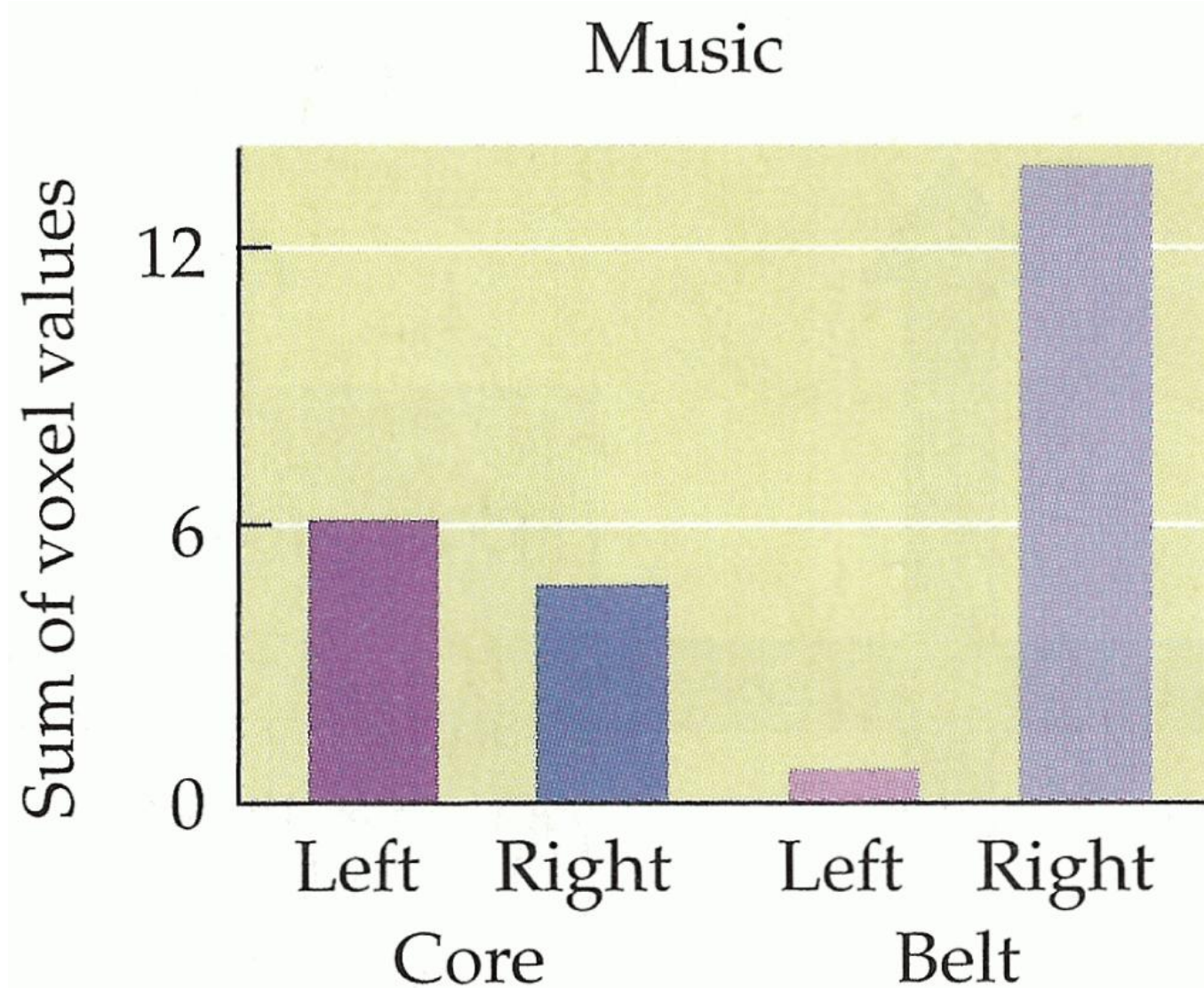
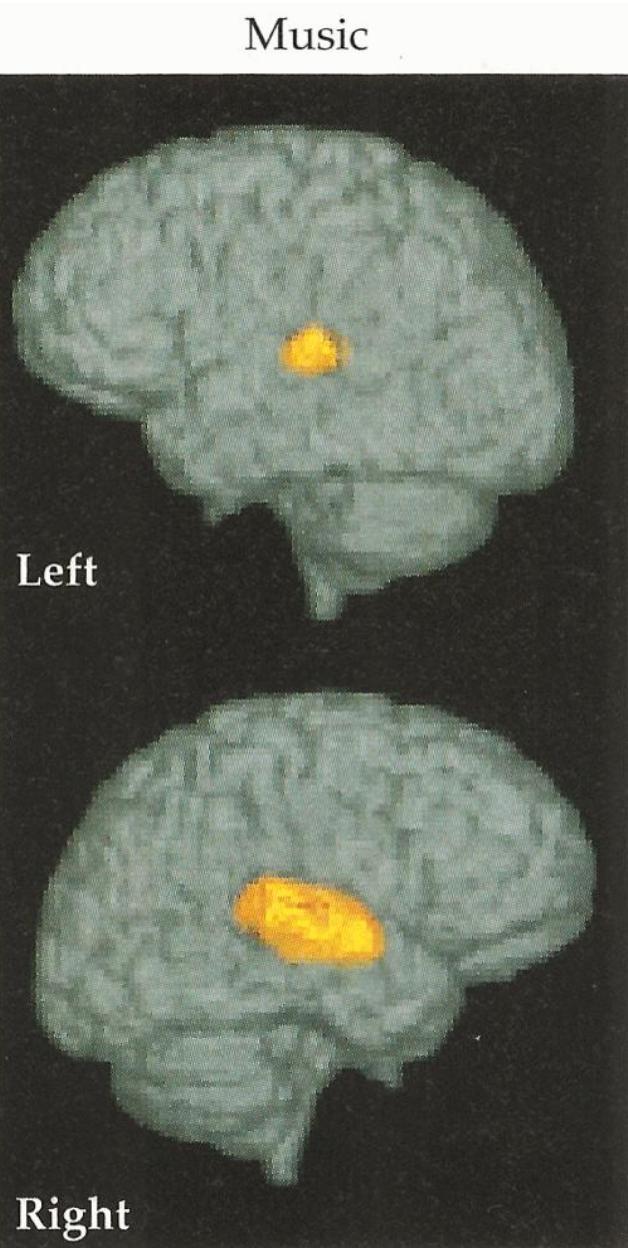






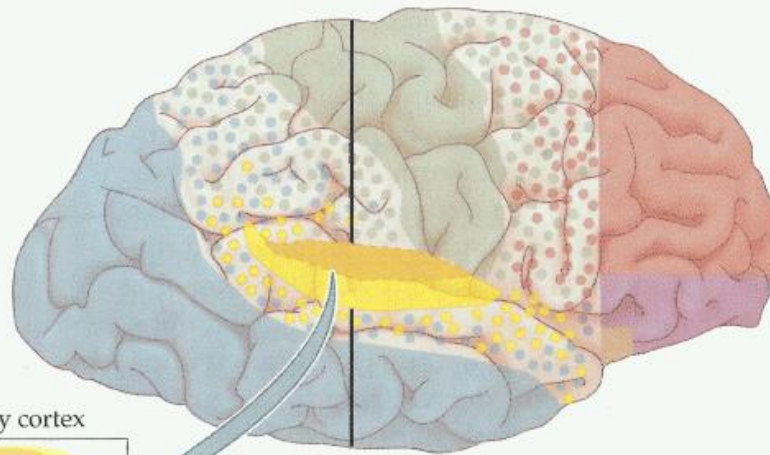
**Functional MRI evidence
for a specialized speech
processing area**

(Principles of Cognitive
Neuroscience, 2008)

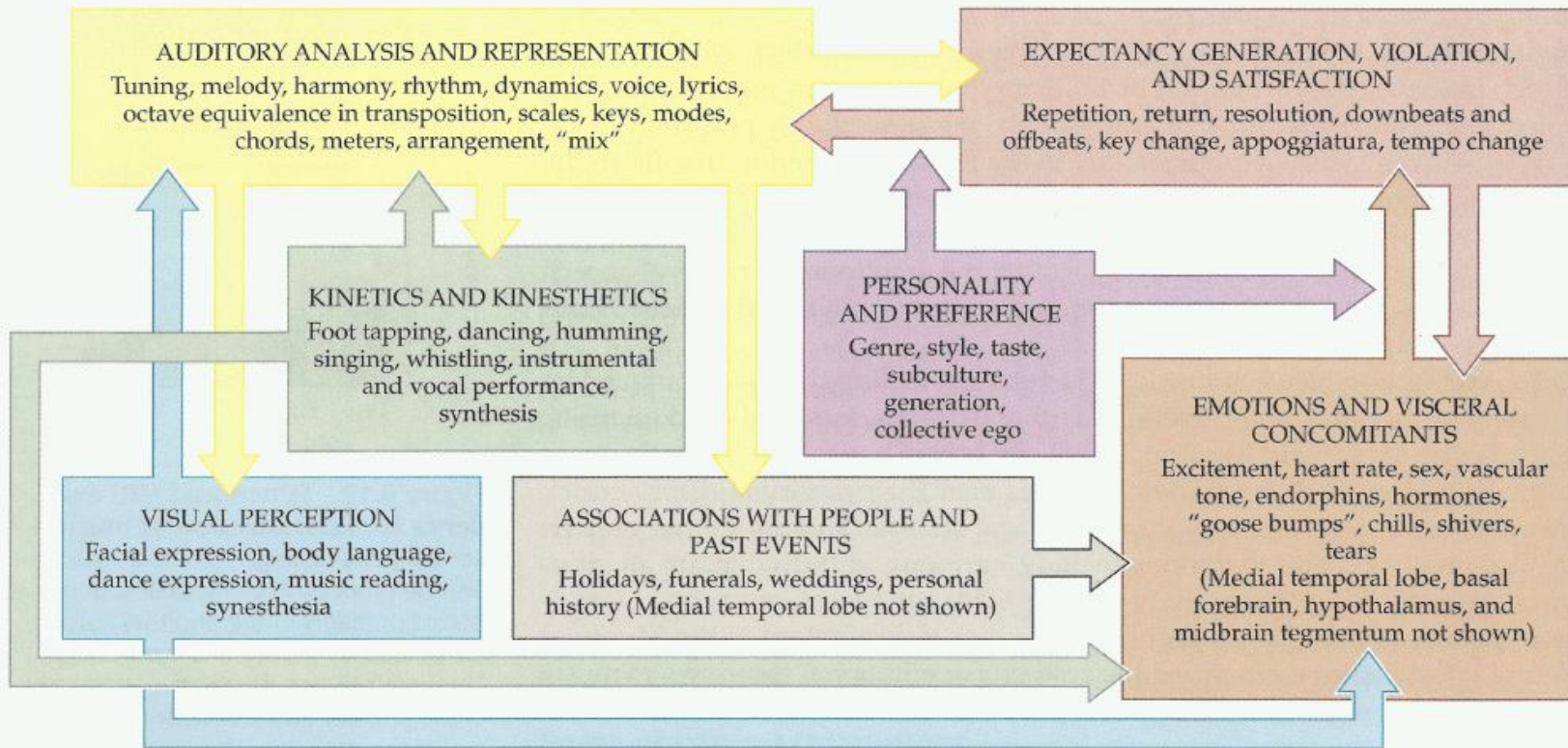
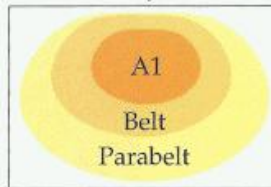


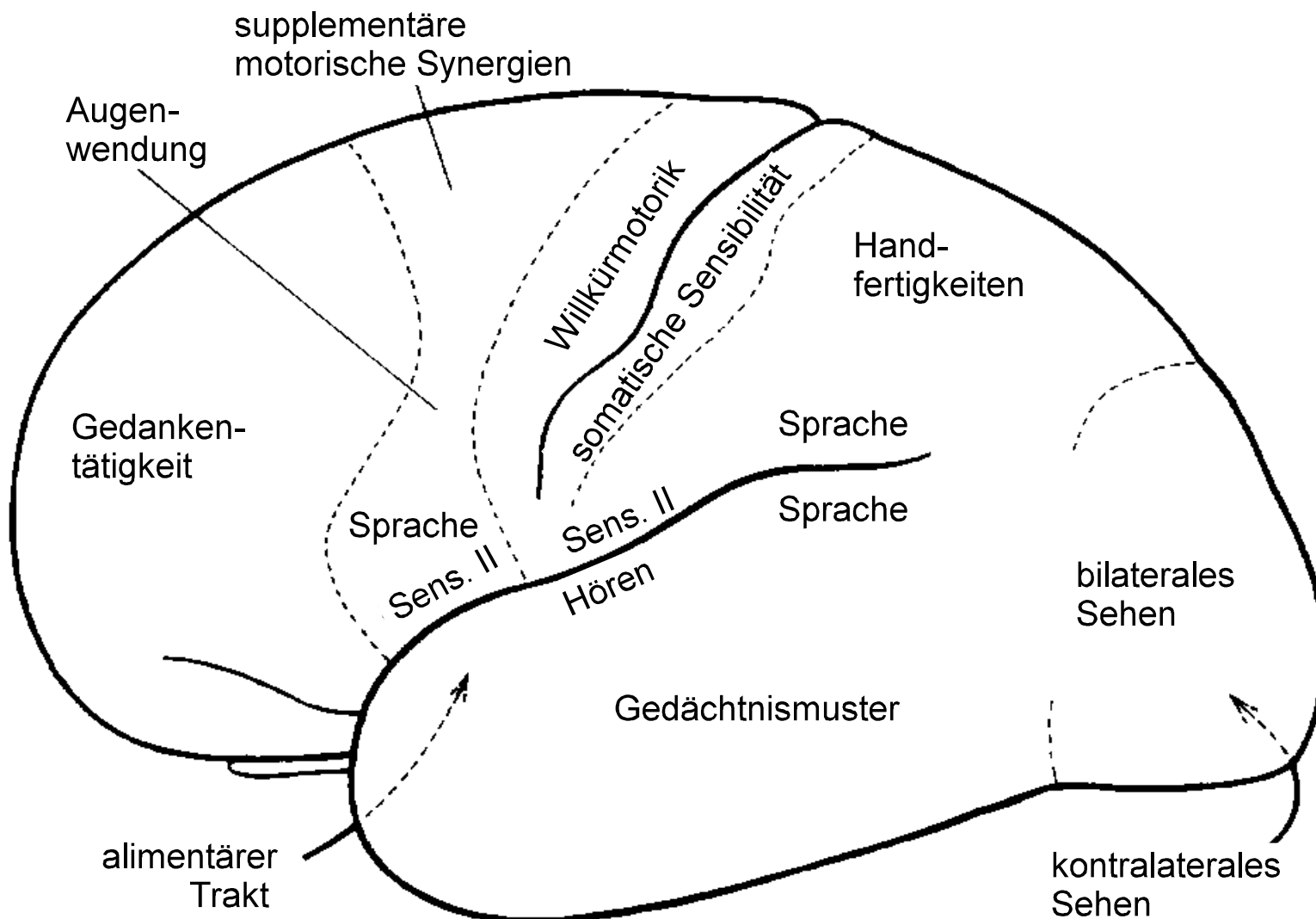
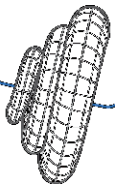
Regions of the right hemisphere activated by musical stimuli

(Principles of Cognitive Neuroscience, 2008)



Auditory cortex





Klangwelten im Kopf

Wege der Musik durch das Gehirn

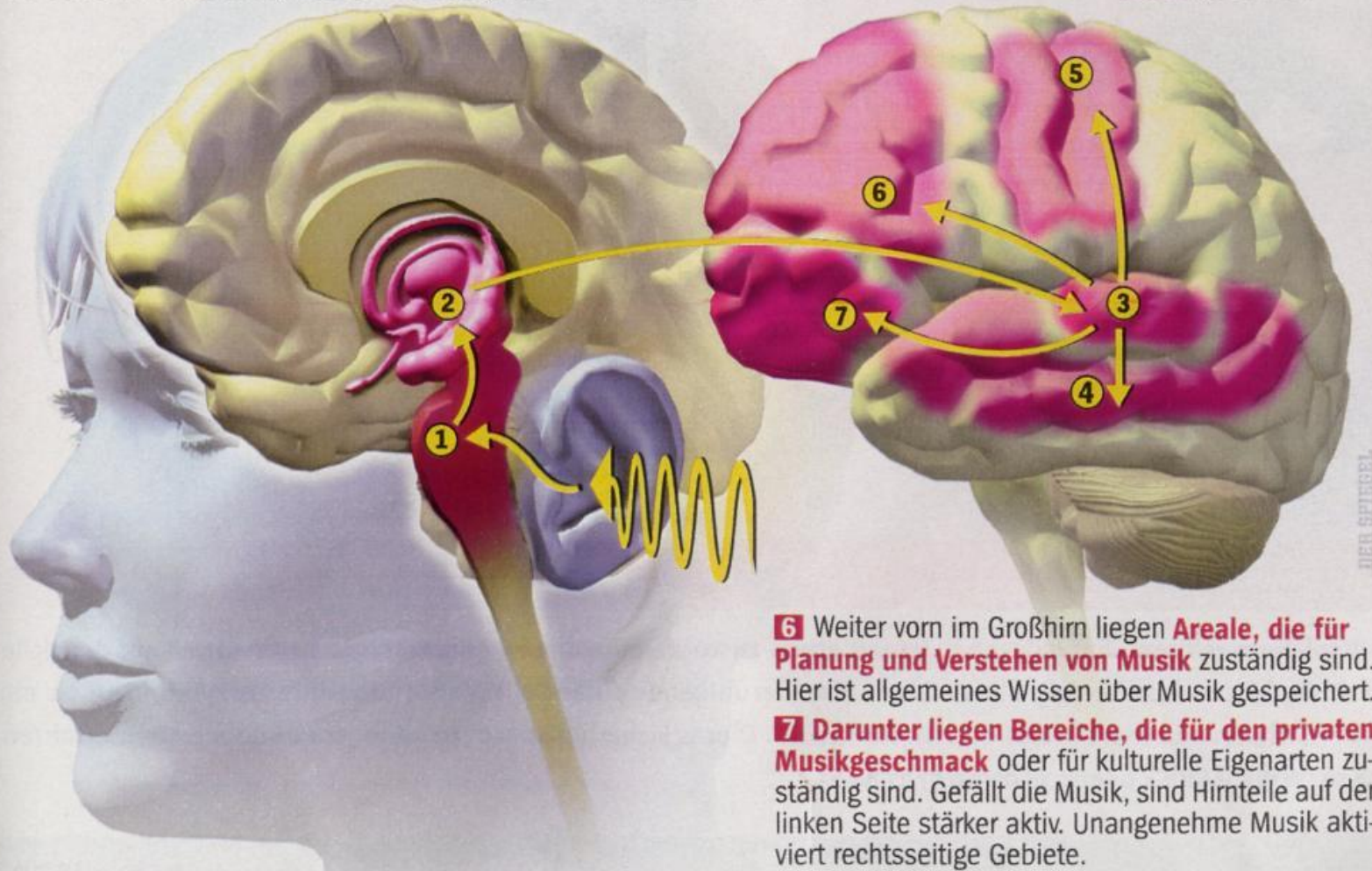
1 Der Hörnerv leitet Klanginformationen an den **Hirnstamm** weiter.

2 Einige Signale erreichen das so genannte **limbische System**, das eine wichtige Rolle in der Verarbeitung von Gefühlen spielt. Schöne Musik stimuliert jene Bereiche, die auch beim Sex oder beim Schokoladeessen aktiv sind. Auch körperliche Reaktionen auf Musik, wie Weinen oder Gänsehaut, werden hier ausgelöst.

3 Die Informationen gelangen in die **primäre Hörrinde** im Großhirn, die Schaltzentrale des Hörens.

4 Umliegend finden sich die **sekundären Hörareale**. In der linken Hirnhälfte werden eher Rhythmen verarbeitet, auf der rechten Seite dagegen Klangfarben und Tonhöhen.

5 Die komplizierten Bewegungen, etwa beim Musizieren und Tanzen, werden von motorischen und **sensorischen Arealen in der Großhirnrinde** gesteuert.



6 Weiter vorn im Großhirn liegen **Areale, die für Planung und Verstehen von Musik** zuständig sind. Hier ist allgemeines Wissen über Musik gespeichert.

7 Darunter liegen **Bereiche, die für den privaten Musikgeschmack** oder für kulturelle Eigenarten zuständig sind. Gefällt die Musik, sind Hirnteile auf der linken Seite stärker aktiv. Unangenehme Musik aktiviert rechtsseitige Gebiete.