

Updated 11 03 2015

**580.625: Structure and Function of the Auditory and Vestibular Periphery
Fall Semester, 2015 (Homewood Academic Schedule)**

Course Directors: E. Glowatzki & P. Fuchs

Summary: This course will cover basic mechanisms and functions of the inner ear and brainstem. This is a companion course and alternates with 580.626, "Structure and Function of the Central Auditory and Vestibular Systems", although these can be taken in either order. The focus is on transmission and transduction of sound and head movements by the auditory and vestibular periphery. Topics include: cellular and molecular mechanisms of mechanotransduction, synaptic signaling and development, primary afferents and the first-order brainstem nuclei, as well as clinical consequences of peripheral damage. Grades will be based on participation in class and first-half and second-half exams (both in class, closed book, short answer/essay types).

Prereqs: an introduction to Neuroscience.
Undergraduates with knowledge in Neuroscience welcome.
Class size limited to 25.

First Semester, odd-numbered years

Meeting Times: Tuesday and Thursday, 8:30 – 9:45 a.m. in 529 Ross Research Bldg. (medical Campus) at the School of Medicine. A short organizational meeting will be held at this location on Thursday, August 27th at 8:30AM before the first lecture.

For further information contact course directors: Elisabeth Glowatzki (eglowat2@jhmi.edu) or Paul Fuchs (pfuchs1@jhmi.edu).

Schedule of Lectures, Fall 2015

1. Aug 27 Overview of the Auditory Periphery (Glowatzki)
2. Sep. 01 Overview of the Vestibular Periphery (Chenkai Dai)
3. Sep. 03 Hair Cell Structure and Mechanotransduction (Fuchs)
4. Sep. 08 Inner Ear Afferent Synapses (Glowatzki)
5. Sep. 10 Inner Ear Afferent Synapses II (Glowatzki)
6. Sep. 15 Development of the Inner Ear (Doetzlhofer)
7. Sep. 17 Hair Cell Regeneration (Doetzlhofer)
8. Sep. 22 Cochlear Mechanics (Spector)
9. Sep. 24 Outer Hair Cell Electromotility and Active Force Production (Spector)
10. Sep. 29 Auditory Nerve (Fuchs)
11. Oct. 01 Inner Anatomy Lab (Hiel) Ross 813 (Temporal Bone Lab)
12. Oct. 06 Anatomy and Physiology of the Ventral Cochlear Nucleus (May)
13. Oct. 08 Anatomy and Physiology of the Dorsal Cochlear Nucleus (May)
14. Oct. 13 Efferent Inhibition of Hair Cells (Fuchs)
15. Oct. 15 Efferent Effects on Hearing (Lauer)
16. Oct. 20 Vestibular Physiology; Vestibular Implant (Della Santina)
17. Oct. 22 Genetics of Hearing Loss (Roux)

Oct. 27 Mid-term exam (through 10/15 lectures inclusive)

18. Oct. 29 Physiology of Hearing Loss (Lauer)

- 19. Nov. 03 Rodent Auditory Phenotyping (Lauer)
- 20. Nov. 05 Gene therapy (W. Chien)
- 21. Nov. 10 Cochlear Implants (Francis)
- 22. Nov. 12 Modeling of the Vestibulo-Ocular Reflex (Gene Fridman)
- 23. Nov. 17 Vestibular brainstem (du Lac)
- 24. Nov. 19 Vestibular cerebellum (du Lac)

Nov. 23 – Nov. 29 Thanksgiving

- 25. Dec. 01 Vestibular Disorders (Carey)
- 26. Dec. 03 Epidemiology of Hearing Loss (Lin)

Dec. 07 Second mid-term exam (On Monday to give the weekend for study)

Dec. 08 - 10 Reading Period

Dec. 12 -19 (Optional paper for extra credit due)