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In-line Phase Contrast Imaging of Soft Tissue in the Mammalian Cochlea LIXIN FAN, Northwestern University Feinberg School of Medicine, 200 E. Superior St., Chicago, IL, 60611, C. RAU, Advanced Photon Source, Argonne National Lab, 9700 S. Cass Ave. , Argonne, IL 60439, I. ROBINSON, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, 104 S. Goodwin Ave., Urbana, IL61801, C.-P. RICHTER, Northwestern University Feinberg School of Medicine, 200 E. Superior St., Chicago, IL, 60611 — Soft tissue has been visualized in a mammalian cochlea with hard X-rays in-line phase contrast imaging at the UNICAT beamline 34 ID-C, APS. The sensation of hearing results from a series of complex events that transform acoustic pressure waves into the perception of sound. During the normal hearing process, sound energy is converted to mechanical energy by the middle ear, which then is converted to motions in the structures of the cochlea. To date, many aspects of the sound induced vibrations are still unclear. Firstly, mechanics of the cochlea are likely to changes by the manipulations, and secondly, cochlear micromechanics are unexplored for the cochlear middle section. Therefore, our objective is to measure the motion patterns of cochlear tissues in a closed cochlea. Thick mammalian cochlear slices have been imaged and were compared with those obtained by light microscopy. Furthermore, intact cochleae have been imaged to identify the soft tissue structures involved in the hearing process.

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