

Editorial

Like integrated circuits and personal computers, the emerging micro- and nanotechnologies will fundamentally change the way we live and work in the future. There are two reasons why we should pay attention to the development and impact of these technologies. Firstly, we should prepare for the changes the technologies will likely bring about to our profession and service. Secondly, as audiologists and neurotologists, we deal with perhaps the most sophisticated microelectromechanical system that nature ever built, namely the ear, which can sense vibrations as small as 0.5 nm. Engineers are not only learning the operational principles of the ear to enhance their technological development, but also how to apply the technologies to addressing a host of clinical issues in otology.

The present special issue, consisting of seven invited papers, showcases potential applications of micro- and nanotechnologies to audiology and neurotology. Spelman reviews the development of cochlear implants and discusses future cochlear electrode arrays. Inspired by the

working of a fly's ear, Miles and Hoy have microfabricated a directional microphone for hearing aids. Bachman and colleagues use polymers to produce micromechanical resonator arrays that may serve as the microphone and frequency analyzer for an analog cochlear implant. Wittbrodt's group have developed a physical model of the human cochlea using microfabrication. Shkel and Zeng describe a microelectromechanical system vestibular implant prototype. The usage of magnetic nanoparticles for inner ear targeted molecule delivery and middle ear implants is described by Kopke and co-workers. Combining microfluidics and transfected cells, Ryan's group have conducted micropatterning studies to control auditory nerve development and growth.

Although the papers were invited, each went through the same rigorous review process as typical papers submitted to *Audiology & Neurotology*. We thank the reviewers and the editorial managers at Karger for their efficient and high-quality professional service.

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