

# UPDATE FROM THE CUTTING EDGE

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The abstracts of the recent research information appearing in the Vol.7 No.4-6 of "AIST TODAY" are introduced, classified by research area.

For inquiry about the full article, please contact the author via e-mail.

Life Science & Technology

## Elucidation of mechanism of bone-conducted ultrasonic perception and development of a novel hearing aid

Human beings are normally unable to hear high-frequency sounds above 20 kHz (ultrasounds). However, bone-conducted ultrasound (BCU) can be experienced as sound, not only by people with normal hearing ability but also by severely hearing-impaired people. By measuring the magnetic field in the brain, BCU perception has been proven objectively. Furthermore, we have identified both the characteristics and the neurophysiological mechanism of BCU perception using psychological, neurophysiological and physical approaches, and developed a BCU hearing aid (BCUHA) for the profoundly deaf. Remarkable results have already been achieved; enabling 30 percent of the profoundly deaf trial subjects to hear simple words and half of them to perceive some sort of sound. The BCUHA is far easier to attach than a cochlear implant, which requires surgery, and thus substantially removes the mental and physical burden experienced by cochlear implant users.



Bone-conducted ultrasonic hearing aid (BCUHA).

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