



The historic investment in research through the American Recovery and Reinvestment Act is funding promising science that is improving health, while contributing to the economy. View more stories at www.sfn.org/recovery.

HEARING LOSS: “Synaptic Determinants of Vestibular Afferent Dynamics”

Stephen Highstein, Marine Biological Laboratory, Woods Hole, Mass.
*Supported by the National Institute on Deafness and Other Communication Disorders,
 National Institutes of Health*

GRANT DESCRIPTION

Synaptic transmission (neural communication) between vestibular hair cells, the sensory element within the inner ear, and their innervated nerve fibers is being studied within the inner ear of the red-eared slider turtle. Once the mode of transmission has been established, results may lead to therapies for inner ear disorders such as Meniere’s syndrome, a disorder of the inner ear that can affect hearing and balance. The Marine Biological Laboratory has received several equipment grants for shared microscopy facilities and for the renovation of facilities for research such as this.

SCIENCE AND HEALTH IMPLICATIONS

The sensory structures within the vertebrate inner ear evolved relatively early and relatively completely. Thus study of the inner ear of almost any vertebrate has implications for the function of any vertebrate inner ear, including that of the human. Once the mode of communication between inner ear sensory structures and their innervated nerve fibers is understood, therapies for conditions where this communication malfunctions (e.g., Meniere’s syndrome) can be determined.

RESEARCH IMPACT: IN THEIR WORDS

“With the recovery funds, I was able to hire Mary Ann Mann, a technician who participates in daily experiments with me. She is a highly skilled collaborator who was able to keep employment because of these recovery funds. She was hired on the day that the recovery funds became available. She has moved to Falmouth, Mass., conveniently located near the Marine Biology laboratory. Without these funds, she would have been forced into retirement.”

–Stephen Highstein, Principal Investigator



The snail-shaped cochlea is the hearing organ of the ear. It contains about 15,000 hair cells that convert sound waves into electrical impulses that travel to the brain via the auditory nerve. Most hearing loss occurs when these hair cells are destroyed, usually due to noise, infections, aging, or genetic disorders. Copyright 2004 Society for Neuroscience. Image credit: Adapted from A.D.A.M., Inc.

The Society for Neuroscience (SfN) is the world’s largest organization of scientists and physicians devoted to advancing understanding of the brain and nervous system. Since its inception in 1969, the Society has grown from 500 members to more than 40,000.