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# SCIENTISTS PROBE THE ROLE OF MOTOR PROTEIN IN HEARING LOSS Presentation Today at Biophysical Society Meeting in Baltimore

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EMBARGOED FOR RELEASE until: 1:45 p.m. EST, on Sunday, March 6, 2011

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WASHINGTON, D.C. (March 6, 2011) -- From grinding heavy metal to soothing ocean waves, the sounds we hear are all perceptible thanks to the vibrations felt by tiny molecular motors in the hair cells of the inner ear. Researchers at the University of Pennsylvania School of Medicine have now identified the mechanism by which a single amino acid change can disrupt the normal functioning of one of the critical components of that physiology -- a molecular motor protein called myo1c, which resides in the cochlea of the inner ear.

The mutation (called R156W), was first identified in an individual suffering from cochlear hearing loss, and it affects the way the myo1c protein interacts with proteins known as actin filaments, another crucial component of the sensory apparatus of the inner ear. This interaction is essential for normal hearing, and scientists have already traced other causes of hearing loss to previously known mutations that interrupt it.

Now Michael Greenberg and his colleagues at UPenn have examined the biochemical and mechanical properties of the mutant myosin protein. Comparing constructs of the normal, "wild-type" protein to the R156W mutant, they examined the two proteins' kinetics and motility and discovered the mutant has a reduced sensitivity to mechanical loads and a lower duty ratio, meaning it spends less time attached to actin filaments.

Though the cochlear cell myo1c defects are associated with hearing loss, how this mutation causes the disease is still a mystery. The exact molecular role of myo1c is hazy, although it has been linked to several important cellular processes including hearing and insulin stimulated glucose uptake within cells. Understanding the defects caused by the R156 mutation could help to solve the puzzle.

"R156 is a highly conserved residue throughout the myosin superfamily. The fact that mutation of this residue affects the myosin duty ratio and strain sensitivity may very well be applicable in other myosins as well. In the long term, we hope to gain greater insight into the mechanism of myosin strain sensitivity and its role in mechanotransduction," says Greenberg.

The group's research is funded by the National Institutes of Health and the American Heart Association.

The Presentation, "A HEARING-LOSS ASSOCIATED MYO1C MUTATION (R156W) DECREASES THE MYOSIN DUTY RATIO AND FORCE SENSITIVITY" is at 1:45 p.m. on Sunday, March 6, 2011 in Hall C of the Baltimore Convention Center. ABSTRACT: http://tinyurl.com/4llnmve

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#### MORE MEETING INFORMATION

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Each year, the Biophysical Society Annual Meeting brings together more than 6,000 scientists and hosts more than 4,000 poster presentations, 200 exhibits, and more than 20 symposia. The largest meeting of its type in the world, the Biophysical Society Annual Meeting retains its small-meeting flavor through its subgroup meetings, platform sessions, social activities, and committee programs.

### **QUICK LINKS**

Meeting Home Page:

http://www.biophysics.org/2011meeting

General Meeting Information:

http://www.biophysics.org/GeneralInfo/Overview/tabid/2062/Default.aspx

Search abstracts:

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## PRESS REGISTRATION

The Biophysical Society invites credentialed journalists, freelance reporters working on assignment, and public information officers to attend its Annual Meeting for free. For more information on registering as a member of the press, please contact Ellen Weiss at eweiss@biophysics.org or 240-290-5606. Also see:

http://www.biophysics.org/Registration/Press/tabid/2148/Default.aspx

### ABOUT THE BIOPHYSICAL SOCIETY

The Biophysical Society, founded in 1956, is a professional, scientific society established to encourage development and dissemination of knowledge in biophysics. The society promotes growth in this expanding field through its annual meeting, monthly journal, and committee and outreach activities. Its over 9,000 members are located throughout the U.S. and the world, where they teach and conduct research in colleges, universities, laboratories, government agencies, and industry. For more information on the society or the 2011 Annual Meeting, visit www.biophysics.org

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