THE BINGHAMTON Parent
BINGHAMTON UNIVERSITY
State University of New York
A Newsletter for Families of Students at Binghamton University

Fall 2003

Huge grant to help build superb hearing aids

If the word "research" strikes you as primarily about the future, take a look at the work being done right now by Professor Ron Miles of the Watson School. Miles recently was awarded a four-year, $6.5 million grant from the National Institute on Deafness and Other Communication Disorders, part of the National Institutes of Health, to support his biomimetic acoustic sensor research. That fancy title translates to the promise of a revolution in hearing-aid technology.

The juxtaposition of the Ormia ochracea fly on the back of a cricket amid several hearing aids gives a sense of scale to engineer Ronald Miles' research. Miles is attempting to mimic the mechanical structure of the fly's auditory system in his design of what will be the world's smallest directional microphone. The microphone will be used in a hearing aid that can be worn inside the ear and allow users to determine the direction of sound.

It's likely that in four short years, 28 million or so aging Americans in and beyond the baby-boomer generation with some hearing loss will be fitted with a lightweight hearing aid that works really well.

The largest single research grant to Binghamton University in its history, Miles' award will support a project titled "Sensing and Processing for Directional Hearing Aids." Miles has done pioneering research with Ormia ochracea, a small parasitic fly whose terrific directional hearing helps it find its next meal.

Research shows that hearing in noisy environments remains the number-one unsolved problem faced by hearing-aid wearers. Improving the directionality of hearing aids so they can reduce unwanted noise by 2 to 5 decibels (dB) and producing microphones that create up to 10 dB less self-noise than those currently available will mean major improvement in noisy environments.

"If you had 20 people in a room all talking away, a reduction of 3 dB would be equivalent to making half of them be quiet," Miles said. "You can imagine how much easier it would be to be able to discern what somebody was saying to you."

Three years ago, Miles' research attracted $2.8 million in support from the Defense Advanced Research Product Agency for a project involving the development of acoustic sensing systems to aid in the detection of troop and equipment movements and to help locate snipers. Miles said he also hopes to adapt his acoustic sensors to predict the impact zone of incoming ordnance to improve soldiers' safety on battlefields. Ultimately, his work will be important for any application in which a miniaturized microphone and signal processing technology could improve the utility and performance of a product.

BINGHAMTON UNIVERSITY State University of New York | PO Box 6000 | Binghamton, NY 13902-6000 | last revised 4/03