

**Department of Communication Sciences and Disorders
COLLEGE OF ALLIED HEALTH SCIENCES**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2010

The Department of Communication Sciences and Disorders is pleased to offer the following research project for the summer of 2009. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

**PROJECT TITLE: THE CORTICAL AUDITORY EVOKED POTENTIALS IN
COCHLEAR IMPLANT USERS**

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Project Description

One of the major challenges in cochlear implants (CIs) is the large variability in CI patients' speech perception performance. Recent studies have shown significant correlations between this variability in speech performance and CI patients' temporal processing abilities assessed by behavioral methods. Besides these behavioral measures, the temporal properties of neural responses to repeated stimuli measured by objective electrophysiological approaches provide important information about the auditory system's processing of temporal cues in sounds. It is unclear how the temporal properties of neural responses are related to speech perception performance. The goal of this project is to investigate the temporal properties of four types of auditory evoked potentials (AEPs) in CI patients: 1) the electric compound action potential (ECAP), 2) the electric auditory brainstem response (EABR), 3) the electric late auditory evoked potential (ELAEP), and 4) the acoustic LAEP. We will compare neurophysiological and speech perception abilities in CI users. We hypothesize that the temporal properties of the LAEP are better correlated to behavioral measures than those of the ECAP and the EABR. Theoretically, the results from the proposed study will provide important insights into the large variability in CI patients' speech understanding. Practically, the proposed research will help to identify appropriate electrophysiological measures that can be used to objectively assess CI benefits. This research may lead to future efforts toward improving the temporal representation of sounds in CI users.