Upcoming Discovery Lecture:

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April 3, 2014
208 Light Hall / 4:00 P.M.
I will present an overview of the significant advances in the understanding the mechanism of action of voltage gated ion channels since the recent determination of x-ray structures of several prokaryotic voltage-gated potassium and sodium channels and their subsequent investigation using high performance computation and modeling. In contrast to what was learned from potassium selective channels, studies of the available sodium channel structures point to a conduction mechanism where partially hydrated sodium ions can explore pore lining sites while being loosely coupled to other ions and water. Discrimination of sodium over other ionic species has also been the subject of intense research revealing the weakly-selective nature of sodium channel structures. Though the characterization of conduction and selectivity within prokaryotic channels holds promise to ultimately shed light on the structure-function interplay of more complex and pharmacologically relevant mammalian channels, much still remains to be done to fully understand the structure and function of these intriguing nanoscale molecular machines.

Prof. Wilson is a Co-Director (with Debara Tucci, M.D.) of the Duke Hearing Center and is an Adjunct Professor in each of three departments at Duke: Surgery, Biomedical Engineering, and Electrical and Computer Engineering. He also is the Chief Strategy Advisor for MED-EL GmbH in Innsbruck, Austria. He has been involved in the development of the cochlear implant (CI) for the past three decades, and is the inventor of many of the signal processing strategies used with the present-day CIs. One of his papers, in the journal Nature, is the most highly cited publication by far in the specific field of CIs. He or he and his teams or colleagues have been recognized with a high number of awards and honors, most notably the 2013 Lasker~DeBakey Clinical Medical Research Award for “the development of the modern cochlear implant — a device that bestows hearing to individuals with profound deafness” (to Graeme Clark, Ingeborg Hochmair, and Wilson); the 1996 Discover Award for Technological Innovation in the category of “sound” (to Wilson); and the American Otological Society’s President’s Citation in 1997 for “Major contributions to the restoration of hearing in profoundly deaf persons” (to Wilson, Charles Finley, Dewey Lawson, and Marian Zerbi). Wilson has been the Guest of Honor at 13 international conferences, the Chairman for two other international conferences, and a keynote or an invited speaker at more than 160 additional conferences.