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강연제목: 망막 전기 자극에 의한 인공 시각 기술 / Getting the Blind to See Again: Electric Stimulation of the Retina for Artificial Vision

Abstract: In the past decade, microelectronic retinal prostheses have demonstrated somewhat useful level of artificial vision in individuals blinded by outer retinal degenerative diseases such as retinitis pigmentosa (RP) or age-related macular degeneration (AMD). Despite impressive clinical outcomes, the restored vision is still far removed from the normal vision. The biggest challenge stems from the remarkably complex structure of the retina. For example, the retina has more than a dozen different types of retinal ganglion cells (RGCs) including ON and OFF types detecting brightness increment and decrement, respectively. For the improved quality of artificial vision, it is crucial to bring electrically-elicited neural activities more in line with the physiological signaling patterns of the healthy retina. This talk will present how varying electric stimulation parameters modulate responses differently in ON and OFF RGCs in the retina. The talk will also cover reduced spiking consistency in ON and OFF RGCs as retina degenerates.

Brief Biosketch

Maesoon Im is a Principal Research Scientist at Brain Science Institute, KIST (Korea Institute of Science and Technology), Seoul, South Korea. He is also an Associate Professor of Bio-Medical Science & Technology Division, UST (University of Science & Technology). He received his B.S. and Ph.D. degrees in Electrical Engineering from KAIST, Daejeon, South Korea. Then, he was a postdoctoral research fellow in the Department of Electrical Engineering and Computer Science at the University of Michigan, Ann Arbor. At the University of Michigan as well as at KAIST, he fabricated various micro-/nano-devices for neuroscientific and biological applications. To add neuroscience expertise, he studied retinal prosthetics and visual neuroscience as a Research Fellow in the Department of Neurosurgery at the Harvard Medical School, Massachusetts General Hospital. He began his principal investigator (PI) career as an Assistant Scientist in the Department of Ophthalmology at Henry Ford Health System, Detroit, Michigan. He was also with Wayne State University as an Adjunct Assistant Professor in the Department of Anatomy and Cell Biology and in the Department of Electrical and Computer Engineering.