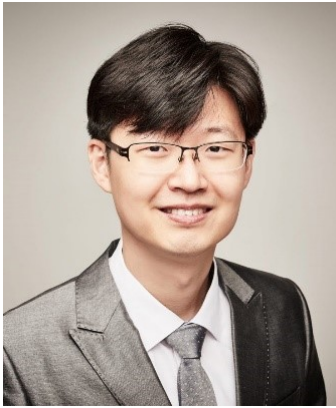


UCSD NANOENGINEERING/CHEMICAL ENGINEERING  
**SPECIAL SEMINAR**

Monday, January 27, 2020

Seminar Presentation: 11:00am - 12:00pm

**CMRR Auditorium***“Ion-to-Ion Amplification through an Open Junction Ionic Diode”***Jeong-Yun Sun Ph.D.***Associate Professor**Department of Materials Science and Engineering  
Seoul National University*

**Abstract:** As biological signals are mainly based on ion transport, the differences in signal carriers have become a major issue for the intimate communication between electrical devices and biological areas. In this respect, an ionic device which can directly interpret ionic signals from biological systems needs to be designed. Particularly, it is also required to amplify the ionic signals for the effective signal processing since the amount of ions acquired from biological systems is very small. In this study, we report on the signal amplification in ionic systems as well as sensing through the modified design of polyelectrolyte hydrogel based ionic diodes. By designing an open junction structure, ionic signals from the external environment can be directly transmitted to an ionic diode. Moreover, the minute ionic signals injected to the devices and can also be amplified to a large amount of ions. The signal transduction mechanism of the ion-to-ion amplification is suggested and clearly verified by revealing the generation of breakdown ionic currents during an ion injection. Subsequently, various methods for enhancing the amplification are suggested.

**Biosketch:** Jeong-Yun Sun is currently an associate professor in the Department of Materials Science and Engineering at Seoul National University (SNU), Republic of Korea. He got his B.S. (2005), M.S. (2007) and Ph.D. (2012) in Materials Science and Engineering at Seoul National University. During his Ph.D., he had stayed at Harvard University for 4 years as a visiting student. After getting Ph.D. (2012), he started to work as a postdoctoral fellow in School of Engineering and Applied Sciences at Harvard University. After his Post-Doc., he came back to SNU and served as an assistant professor for 4 years. His research was focused on developing ionic materials and devices. Dr. Sun has published many high impact peer-reviewed journal papers including Nature, Science, and Advanced Materials etc. He has received honorable awards including “Scientist in this Month” from Korean Ministry of Science (2018), “Young Scientist Award” from The Polymer Society of Korea (2017) and “Young Scientist Award” from Korean Materials Research Society (2016).