Senyon Choe
Professor
Structural Biology Laboratory

“We are interested in understanding how biological messages are written and delivered between cells by messenger molecules in the body. The two messenger systems we are focusing on are called ion channels (for e-mails) and protein hormone receptors (for snail mail). By visualizing these messengers to better understand how such messages are coded for specific delivery, we can create brand-new messages on our own.”

Receptors and ion channels are both membrane-embedded proteins, which are hard to produce and hence notoriously difficult to study. Therefore, Choe and his team are keenly interested in developing new techniques that allow them to penetrate the elusive world of membrane proteins, which keep the lines of communication open between cells and thus are popular targets for the majority of blockbuster drugs. Lately, they discovered a “partner” molecule called Mistic that allows the widespread production of membrane proteins, enabling scientists to determine their atomic structure and design drugs that interfere with disease processes involving membrane proteins. Choe’s group has also done pioneering work on the molecular structure of an ion channel, which is important to many physiological functions ranging from heart rate to nerve cell communication. By understanding the atomic details of how channel proteins assemble into an ion-conducting pore and how such a pore is regulated by biological signals, scientists will be more likely to understand fundamental mechanisms of various neurological disorders and come up with a new strategy to treat them.

For more information, please visit salk.edu/faculty/choe.html