

Voltage Gated Potassium Channels

Shengjie Feng¹

¹*UCSF*

sjfeng100@gmail.com

Voltage gated potassium channels (Kvs) are one of the most important groups of ion channels in setting and resetting neurons' electrical state. To precisely control and diverse neural function, Kvs need to form hetero-tetramers by various compositions and arrangement of a subunits and their auxiliary subunits in different types of neurons. However, the stoichiometry of endogenous Kv channels in the brain remains largely unknown due to the technique limitation. Here, we developed a new strategy which enabled us to solve high-resolution structures of endogenous potassium channels from the mouse brains. We solved the hetero-tetrameric structures of endogenous Kv1.6-containing complexes and found that Kv1.6 can form complexes with multiple members, including Kv1.1, Kv1.2, Kv1.3, Kv1.4 and Kv1.5 in the family. Our study revealed many compositions of endogenous Kv1 channels in the brain and showed that the assembly of these a subunits was not random. We believe that our work will advance the understanding of how native ion channels contribute to neuronal activity.