ATP-sensitive potassium channels (K\textsubscript{ATP} channels) are ion channels that selectively allow potassium ions to permeate the cell. They are widely distributed among tissues, including those of the pancreas, brain, heart, and smooth muscles, and play important roles in many physiological processes, such as hormone secretion and vasodilatation. K\textsubscript{ATP} channels are ion channels that selectively allow potassium ions to permeate the cell. They are widely distributed among tissues, including those of the pancreas, brain, heart, and smooth muscles, and play important roles in many physiological processes, such as hormone secretion and vasodilatation. K\textsubscript{ATP} channels are widely distributed among tissues, including the pancreas, brain, heart, and smooth muscle, and play important roles in many physiological processes, such as hormone secretion and vasodilatation. Genetic mutation of genes that encode K\textsubscript{ATP} channel subunits can lead to genetic diseases and neuronal diseases. Therefore, K\textsubscript{ATP} channels are important drug targets. Clinically relevant sulfonylureas, which inhibit pancreatic K\textsubscript{ATP} channels and serve as insulin secretagogues for the treatment of type II diabetes, whereas K\textsubscript{ATP} activators, such as potassium channel openers (KCOs), activate K\textsubscript{ATP} channels, are used for treating hypoglycemia, and show promise for may be involved in myoprotection. Previous studies have established that the functional K\textsubscript{ATP} channel is a hetero-octamer composed of four inward-rectifying potassium channel 6 (Kir6) subunits and four sulfonylurea receptor (SUR) regulatory subunits. The Kir6 subunits are encoded by either KCNJ8- KCNJ11 (Kir6.1) or KCNJ11 (Kir6.2). Kir6 subunits and harbor sites for inhibitory ATP binding. The activities of Kir6 subunit activities can be enhanced by PIP\textsubscript{2}, which is a signaling lipid present in the inner leaflets of the plasma membrane. The SUR subunits are composed of the
N-terminal transmembrane domain 0-loop 0 (TMD0-L0) and ATP-binding cassette (ABC) transporter-like modules.