ATP-sensitive potassium channels (K_{ATP} channels) are ion channels that selectively allow potassium ions to permeate ~~the~~a cell. Their ~~channel~~ activities are tightly regulated by endogenous nucleotide metabolites. ~~Specifically~~In particular, they are inhibited by ATP and activated by Mg-ADP~~.~~. By sensing the intracellular ADP/ATP ratio, ~~K_{ATP}~~ these channels ~~tune~~regulate ~~the~~ potassium ion efflux across the plasma membrane and adjust the membrane potential. Therefore, ~~K_{ATP} channels~~they convert the cellular metabolic status into electrical signals, which provide a unique output ~~that has~~with broad physiological effects.

K_{ATP} channels are widely distributed in ~~many~~ several tissues, including those of the pancreas, brain, heart, and smooth muscle, and they ~~play~~are important ~~roles~~ in many physiological processes, such as hormone secretion and vasodilatation. ~~Genetic mutation~~Mutation of genes that encode K_{ATP} channel subunits can ~~lead to~~ cause several metabolic ~~diseases~~ and neuronal diseases. Therefore, ~~K_{ATP}~~ these channels are important drug targets. Clinically relevant sulfonylureas ~~drugs~~ inhibit pancreatic K_{ATP} channels and serve as insulin secretagogues for ~~the treatment of~~treating type II diabetes, ~~while~~whereas ~~K_{ATP} activators, such as~~ potassium channel openers (KCOs) activate K_{ATP} channels, are used for treating ~~-~~hypoglycemia, and show promise for myoprotection. Previous studies have established that the functional K_{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~~* *KCNJ8* (Kir6.1) ~~or~~ or *KCNJ11* (Kir6.2)~~. Kir6 subunits~~ and harbor sites for inhibitory ATP binding. ~~The activities of~~ Kir6 can be enhanced by PIP_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 ~~cassettes~~cassette (ABC) transporter-like modules.

Comment [A1]: Making sure an abbreviation and its spelled out form match is essential to avoid any confusion to readers. Here, the abbreviation of "ATP-sensitive potassium channels" has been revised to "K_{ATP} channels" for accuracy.

Comment [A2]: Excessive repetition of nouns or noun phrases can hamper readability. Therefore, pronouns should be used instead of repeating nouns at multiple instance.