ATP-sensitive potassium channels (K_{ATP} channels) ~~are ion channels that~~ selectively allow potassium ions to permeate ~~the~~a 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_{ATP} ~~Their~~ channels ~~activities~~ are tightly regulated by endogenous nucleotide metabolites~~. Specifically~~; in particular, they are inhibited by adenosine triphosphate (ATP) and activated by Mg-adenosine diphosphate (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 tissues, including the pancreas, brain, heart, and smooth muscle, and they playimportant roles in many physiological processes, such as hormone secretion and vasodilatation.~~ ~~Genetic mutation~~Because mutation of genes that encode K_{ATP} channel subunits ~~can lead~~are known to cause several metabolic ~~diseases~~ and neuronal diseases~~. Therefore~~, ~~K_{ATP}~~ K_{ATP} 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~~may be involved in myoprotection. ~~Previous studies have established that the~~ A functional ~~K_{ATP}~~ K_{ATP} channel is a hetero-octamer ~~composed of~~ comprising 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 subunit activities 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

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]: Some text has been rearranged here for better flow of information about K_{ATP} channels.

Comment [A3]: Excessive repetition of nouns or noun phrases can hamper readability. Therefore, pronouns should be used instead of repeating nouns at multiple instance.

Comment [A4]: The phrase "genetic mutation of genes" has been revised to "mutation of genes" to avoid repetition.

N-terminal transmembrane domain 0-loop 0 (TMD0-L0) and ATP-binding ~~cassettes~~cassette (ABC) transporter-like modules.