An inwardly rectifying K^+ channel Kir4.1 is a potential target to develop new drugs for neuronal diseases and hearing loss.

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An inwardly rectifying K^+ channel Kir4.1 is dominant in brain astrocytes and crucially involved in K^+-buffering. Mutations in its gene are suggested to cause epilepsy. We found that some antidepressants blocked Kir4.1-current, which would be involved in their therapeutic and/or adverse actions. We also clarified that membrane cholesterol content affected Kir4.1-activity. Neuronal defects in lipid-metabolic diseases may be therefore associated with dysfunction of Kir4.1. On the other hand, we previously revealed that Kir4.1 was expressed in epithelial tissue of cochlea in inner ear and essential for audition. Its knockout mice are reported to be deaf. These observations imply that Kir4.1 is a potential target to develop new drugs for neuronal and hearing disorder.