



New Cell Lines Containing Stably Expressed K_{ATP} Pores for High Throughput Screening

WARF: P07052US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in new cell lines that contained stably expressed potassium channel pores $K_{IR6.1}$ and $K_{IR6.2}$.

Overview

Sulfonylurea receptors (SURs) regulate the opening and closing of ATP-sensitive potassium channels (K_{ATP}). They play important roles in insulin secretion in the pancreas and myocardial protection in the heart. At least two isoforms of SUR exist, and the mRNA from each isoform can be spliced in different ways to result in further variants of SUR. The SUR1 isoform encodes the high-affinity sulfonylurea receptor, which is found in pancreatic beta-cells, while the SUR2 isoform encodes the low-affinity sulfonylurea receptor, which is mainly present in mitochondria-rich cardiac, smooth and skeletal muscles.

Variants of SUR are potential targets for the treatment of cardiovascular disease and conditions such as type II diabetes. However, additional tools are needed for the study of SURs.

K_{ATP} channels consist of pore-forming $K_{IR6.x}$ and regulatory SURx subunits. Co-expressing a $K_{IR6.x}$ pore and a SURx in a heterologous expression system results in the production of a recombinant channel that can be used for physiological and biochemical experiments. The recombinant channels have similar characteristics to native K_{ATP} channels, making them powerful tools to study new SUR isoforms, alternative splice variants and sub-type variants. However, most K_{ATP} channel subunits are co-expressed transiently, resulting in very low success rates. Additionally, HEK-293 cells, which commonly have been used to express K_{ATP} channel subunits, have endogenous SUR2.

The Invention

UW-Madison researchers have created two cell lines in which a $K_{IR6.1}$ or $K_{IR6.2}$ gene is stably expressed in COS1 cells. Because the K_{ATP} pores are stably expressed, they should provide an improved tool for studying SUR isoforms and splice variants. COS1 cells also have no background SUR.

These cell lines potentially could be used to identify novel compounds for cardiovascular disease, including hypertension, heart failure and myocardial protection from ischemia. They also could be useful in the development of therapies for other conditions, such as type II diabetes.

Applications

- Drug screening
- Screening for new potassium channel openers and blockers
- May be useful in the development of therapies to prevent or treat conditions such as hypertension, heart failure, type II diabetes or angina

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Key Benefits

- Stable expression of K_{ATP} pores provides an improved tool for studying SUR isoforms and splice variants.



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- COS1 has no endogenous background SUR.
- Cell lines are stable.

Additional Information

For More Information About the Inventors

- [Jonathan Makielski](#)

Tech Fields

- [Research Tools : Cell lines](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

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