TECHNOLOGY

Methods for Regulating Urinary Potassium

OVERVIEW

Potassium is the most abundant intracellular cation. It is critically important for many physiologic processes, including maintenance of cellular membrane potential, homeostasis of cell volume, and transmission of action potentials in nerve cells. Small changes in the extracellular potassium level can have profound effects on the function of the cardiovascular and neuromuscular systems. Pharmacotherapy has progressed rapidly over the last 20 years with the result that general practitioners more and more often use drugs which may influence potassium metabolism at the kidney or gastrointestinal level (Ex: Kayexalate), or the transmembrane transport of potassium at the cellular level (Ex: Torsemide). Potassium abnormalities may result in life-threatening clinical conditions including Hypo and Hyperkalemia. The inventors have discovered a novel potassium channel (ROMK) internalization sequence and its corresponding binding partner, Autosomal Recessive Hypercholesterolemia (ARH) gene, which acts to remove ROMK from the membrane leading to decreased potassium loss. Inhibitors of this process will increase the number of ROMK channels at the membrane, increasing K+ secretion and decrease blood K+. Increasing the level or activity of ARH will lead to decreased K+ secretion and increased blood K+.

APPLICATIONS

Hypokalemia caused by renal tubular acidosis, leukemia, use of diuretics or insulin
Hyperkalemia caused by use of ACE Inhibitors, Addison?s disease, rhabdomyolysis, therapeutics that cause large numbers of cells to release potassium into the blood stream.

ADVANTAGES

-Novel target that controls the amount of potassium channel in kidney cell membranes.
-Large overall market size of patients with heart disease, Addison?s disease or patients taking diuretics, ACE inhibitors, cancer chemotherapy, etc.

STAGE OF DEVELOPMENT

-In vitro studies with RNAi.
-Animal studies planned.

R&D REQUIRED

-In vivo studies.
-Compound library screen.

LICENSING POTENTIAL

UM seeks to develop and commercialize by an exclusive or non-exclusive license agreement and/or sponsored research with a company active in the area.

CONTACT INFO

Office of Technology Transfer
620 W Lexington St., 4th Floor
Baltimore, MD 21201
Email: ott@umaryland.edu
Phone: (410) 706-2380

Additional Information

INSTITUTION

University of Maryland, Baltimore

PATENT STATUS

U.S. Patent 8,288,346, issued October 16, 2012

CATEGORIES

- Therapeutics
- Small molecules
- Biologics

INVESTIGATOR(S)

Paul Welling
Liang Feng

ATTACHMENTS

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