Selective Voltage Gated KV1.3 Potassium Channel Inhibitors

Tech ID: 29228 / UC Case 2004-642-0

ABSTRACT

Researchers at the University of California, Davis, have discovered a composition of 5-phenoxyalkoxypsoralens that inhibits potassium channels to treat autoimmune diseases and disorders that involve abnormal homeostasis, body weight and peripheral insulin sensitivity.

FULL DESCRIPTION

T-lymphocytes are key players in autoimmune diseases. Current therapies for T cell-mediated autoimmune diseases typically involve the use of immunosuppressants. Immunosuppressants are non-specific and as a result have severe side effects including liver and renal damage. There is a need for new targeted therapies and treatments for autoimmune diseases with lower risk for side effects.

Researchers at the University of California, Davis, have developed a new class of small-molecule inhibitors that block low nanomolar Kv1.3 potassium channels. By targeting Kv1.3 channels, the predominate potassium channel in effector memory T cells, the molecules preferentially suppress T-cell proliferation. Kv1.3 channels have also been shown to regulate energy homeostasis, body weight, and peripheral insulin sensitivity, lending to their use in such disorders. By inhibiting specific channels, the small molecules provide specific therapeutic effects with minimal side effects.

APPLICATIONS

- Autoimmune diseases
- Organ rejection and/or graft vs. host disease
- Diseases and disorders that involve abnormal homeostasis, body weight and peripheral insulin sensitivity

FEATURES/BENEFITS

- Treats issues such as organ rejection and/or graft vs. host disease
- Treats autoimmune disorders (blood, endocrine, GI, musculoskeletal, ophthalmologic, skin nervous, vascular)
- Regulates energy homeostasis, body weight, and peripheral insulin sensitivity

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,557,138	07/07/2009	2004-642

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Selective KCa3.1 Channel Activators as Novel Antihypertensives
- Riluzole Derivatives Inhibit Neuronal Activity-Regulated Glutamine Transport
- A mixed Nav blocker and KCa2 activator, as a potent novel anticonvulsant
- Optimized Non-Addictive Biologics Targeting Sodium Channels Involved In Pain Signaling

CONTACT

Raj Gururajan
rgururajan@ucdavis.edu
tel: 530-754-7637.



INVENTORS

- Sankaranarayanan, Ananthakrishnan
- Wulff, Heike

OTHER INFORMATION

KEYWORDS

5-phenoxyalkoxypsoralens, KVI.3, potassium channel, T-lymphocytes, autoimmune disease, organ transplants, graft vs. host disease, voltage gated

CATEGORIZED AS

- **Medical**
- Disease: Autoimmune and Inflammation
- New Chemical Entities, Drug Leads
- Other
- Therapeutics

RELATED CASES

2004-642-0, 2002-157-2

University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel: 530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax: 530.754.7620

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