Novel Inhibitors of N-Acylethanolamine-Hydrolyzing Acid Amidase (NAAA)

Tech ID: 18747 / UC Case 2007-532-0

BACKGROUND

Ethanoloamides of long-chain fatty acids, termed N-acylethanolamines (NAEs) have been reported to have a variety of biological activities. NAEs are a substrate of N-acylethanolamine-hydrolyzing acid amidase (NAAA) that catalytically hydrolyze NAEs to ethanolamine and the corresponding fatty acid. The catalytic activity of NAAA is distinct from that of fatty acid amide hydrolase (FAAH) and NAAA exhibits a preference for N-palmitoylethanolamine (PEA) over other NAEs. PEA has anti-inflammatory, anti-nociceptive, immunosuppressive, neuroprotective and also anti-oxidant activity. These characteristics make NAAA an excellent therapeutic target for discovery of novel compounds to treat pain, inflammation, and other conditions that may benefit from modulating the levels of endogenous fatty-acid ethanolamides, particularly PEA.

TECHNOLOGY DESCRIPTION

Current analgesic and anti-inflammatory agents produce side effects, limited efficacy and there remains an unmet need for new therapeutics for pain and inflammatory disorders. UC Irvine investigators have discovered a new class of compounds that inhibit N-acylethanolamine-hydrolyzing acid amidase (NAAA). Several novel NAAA inhibitors showed submicromolar activity in vitro enzymatic assays. Potent and selective compounds were further evaluated for anti-inflammatory effects in animal models. An increase in PEA levels, modulation of the immune cell infiltrate, and a reduction in inflammation were demonstrated. NAAA inhibitors will be useful to alleviate conditions associated with a reduced concentration of N-palmitoylethanolamine (PEA), such as pain and inflammation, and neurodegenerative disorders.

APPLICATIONS

Various NAAA inhibitors were identified that will be useful in the treatment of conditions associated with reduced levels of endogenous ethanolamides. NAAA inhibitors represent therapeutic agents for the treatment of inflammatory diseases (rheumatoid arthritis, osteoarthritis, asthma, psoriasis), pain, metabolic diseases, and neurodegenerative diseases such as Alzheimer's Disease.

PATENT STATUS

Country	Type	Number	Dated	Case
Canada	Issued Patent	2856522	10/27/2020	2011-057
United States Of America	Issued Patent	10,363,237	07/30/2019	2007-532
United States Of America	Issued Patent	9,908,848	03/06/2018	2011-056
Japan	Issued Patent	6266528	01/05/2018	2011-057
Australia	Issued Patent	2012340519	01/03/2018	2011-057
United States Of America	Issued Patent	9,828,338	11/28/2017	2013-109

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OTHER INFORMATION

CATEGORIZED AS

» **Materials & Chemicals**
» Composites
» **Medical**
» Disease: Autoimmune and Inflammation
» Disease: Cancer
» Disease: Central Nervous System
» Disease: Metabolic/Endocrinology
» Screening
» **Veterinary**

Germany	Issued Patent	2782567	03/22/2017	2011-057
France	Issued Patent	2782567	03/22/2017	2011-057
United Kingdom	Issued Patent	2782567	03/22/2017	2011-057
Italy	Issued Patent	2782567	03/22/2017	2011-057
United States Of America	Issued Patent	9,353,075	05/31/2016	2011-057
United States Of America	Published Application	20100311711	12/09/2010	2007-532

» Therapeutics

RELATED CASES

2007-532-0, 2011-056-0, 2011-057-0, 2013-109-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Novel Inhibitors Of Endocannabinoid Inactivation for Treatment of Pain, Anxiety and Depression
- Therapy to improve survival in patients with end stage renal disease
- Novel Acid Ceramidase Inhibitors for Oncology and Hyperproliferative Skin Disorders

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