Chemical Synthesis of Lipid Mediator 22-HDoHE and Structural Analogs

Tech ID: 27634 / UC Case 2017-111-0

ABSTRACT

Researchers at the University of California, Davis have developed an efficient method to chemically synthesize the endogenous lipid mediator, 22-hydroxydocosahexaenoic acid (22-HDoHE) which can be applied to related natural mediators and analogs.

FULL DESCRIPTION

Although effective, current FDA approved angiogenesis inhibitors to treat angiogenic diseases, like macular degeneration, or to inhibit tumor growth in cancer have various limitations. Several of these drugs, which utilize synthetic compounds, are associated with adverse side effects such as issues with wound healing, heart and kidney function, fetal development, and reproduction. In some cases the effects can include problems with bleeding, clots in the arteries (resulting in stroke or heart attack), hypertension, and protein in the urine.

Researchers at the University of California, Davis have developed a method to chemically synthesize the natural endogenous lipid mediator, 22-hydroxydocosahexaenoic acid (22-HDoHE), with demonstrated anti-angiogenic and anti-tumor activity. 22-HDoHE is an endogenous ω-hydroxylated polyunsaturated fatty acid (PUFA) produced by cytochrome P450 omega-hydroxylase enzyme. Because it occurs in many tissues such as brain, lung, kidney and liver tissue, it has demonstrated anti-angiogenic activity in primary endothelial cells and can inhibit tumor growth *in vivo*. In addition, 22-HDoHE is endogenously present in the human body, meaning that this compound or its structural analogs has the potential to produce less adverse side-effects.

APPLICATIONS

- Inhibit tumor growth, angiogenesis, and lymphangiogenesis

FEATURES/BENEFITS

- Anti-angiogenic and anti-tumor activity *in vitro* and *in vivo*
- Potentially fewer side-effects
- Chemical synthesis

RELATED MATERIALS

- • Hwang SH, Wagner K, Xu J, Yang J, Li 2, Cao Z, Morisseau C, Lee KS, Hammock BD. Chemical synthesis and biological evaluation of ?-hydroxy polyunsaturated fatty acids. Bioorg Med Chem Lett. 2017 Feb 1;27(3):620-625 - 02/01/2017

PATENT STATUS

Country	Type	Number	Dated	Case

CONTACT

Amir J. Kallas
ajkallas@ucdavis.edu
tel: .

INVENTORS

- Hammock, Bruce D.
- Hwang, Sung Hee

OTHER INFORMATION

KEYWORDS

oncology, 22-HDoHE, 20-HEPE, 20-HETE, angiogenesis, cancer, natural, lipid mediator, omega-hydrox PUFA

CATEGORIZED AS

- **Materials & Chemicals**
  - Chemicals
- **Medical**
  - Disease: Cancer
  - Therapeutics

RELATED CASES

2017-111-0

United States Of America	Issued Patent	11,001,783	05/11/2021	2017-111
United States Of America	Issued Patent	10,689,595	06/23/2020	2017-111

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Method of Preventing Bone Loss and Periodontal Disease
- Multi-Target Inhibitors for Pain Treatment
- Improved Dioxin Detection and Measurement
- Detection System for Small Molecules
- Small Molecule sEH Inhibitors to Treat Alpha-Synuclein Neurodegenerative Disorders
- Soluble Epoxide Hydrolase-Conditioned Stem Cells for Cardiac Cell-Based Therapy
- Beneficial Effects of Novel Inhibitors of Soluble Epoxide Hydrolase as Adjuvant Treatment for Cardiac Cell-Based Therapy
- Antibodies: Bacillus Delta Endotoxin PAbs
- Antibodies: Bromacil Herbicide PAbs
- Novel Neuropathy Treatment Using Soluble Epoxide Inhibitors
- Novel and Specific Inhibitors of p21
- Antibodies for Pseudomonas (P.) aeruginosa
- Antibodies: Urea Herbicide Pabs
- Bioavailable Dual sEH/PDE4 Inhibitor for Inflammatory Pain
- Antibodies: Triazine Herbicide Pabs
- Optimized Non-Addictive Biologics Targeting Sodium Channels Involved In Pain Signaling
- Soluble Epoxide Hydrolase Inhibitors For The Treatment Of Arrhythmogenic Cardiomyopathy And Related Diseases
- A New Pharmaceutical Therapy Target for Depression and Other Central Nervous System Diseases

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