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Melanins Synthesized Chemically or *via* Enzyme Catalysis

A Method for Developing Antiviral Compositions

Contact

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Field

- Antivirals

Technology

Method for synthetically producing melanins

Key Features / Benefits

- Produce melanins in high-yields
- Potential to combine with current antiviral therapies to overcome resistance

Stage of Development

The technology-process currently in developmental stage as a method for producing antiviral-grade compounds

Status

Seeking development & licensing partner.

Patent Status

- Patent pending

Background

Melanins have been identified as having anti-HIV properties, especially when containing subunits of L-dopa. Furthermore, synthetic melanins have been shown to have activity against HIV infections *in vitro*. Crude and purified preparations of plant-derived melanins prevent viral infections by interfering with the early steps in the infection process, specifically the attachment of the virus to epithelial cell surface membranes of a potential host and/or the fusion of the viral membrane with the host cell. This behavior makes melanins ideal for preventing viral infections.

Need for Antiviral Treatments

The antiviral market is highly competitive with already dozens of brand-name antiviral agents. The market is driven by the uptake of newer antiretroviral agents in combination therapies, and the launch of at least ten new products for the treatment of HIV and hepatitis by 2012. There is also a vast amount of promising anti-viral technologies in the pipeline. One of the main attributes sought in new antiviral therapies is the ability to treat patients that have presented as resistant to existing treatments.

Method for Synthetically Producing Antiviral Compounds

The present invention is a method for synthetically producing melanins for the use of preventing and treating viral diseases. Its competitive advantage is that it provides a unique method for synthetically producing melanins, including those of novel water-soluble chemical structure, with antiviral activity in high yields, thus making it possible to develop a large enough supplies of melanins to develop and compose them as antiviral treatments. In particular, the present invention includes prevention and treatment for HIV disease and associated diseases. The method includes administering the melanins derived from the present invention, or a combination of the synthetic melanin and one or more other pharmaceutical agents, to the subject in a pharmaceutically compatible carrier and in an amount effective to inhibit the development or progression of HIV disease. Although the treatment can be used prophylactically in any patient in a demographic group at significant risk for such diseases, subjects can also be selected using more specific criteria such as definitive diagnosis of the condition. The melanins of the present invention are ideally administered as soon as possible before potential or after actual exposure to HIV infection.

Opportunity

Loyola is looking for a commercial partner well-positioned in the marketplace to both further develop and utilize this technology.



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Inventor

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Dr. Holmes is Professor of Pathology and of Cell Biology, Neurobiology, and Anatomy at the Stritch School of Medicine of Loyola University Chicago. He is the Director of the Special Chemistry, Endocrinology, and Immunoserology Laboratories and the Laboratory Information Services section of the Department of Pathology of Loyola University Health System. Dr. Holmes received a BA degree in biology and a Ph.D. in Neurosciences from the University of California at San Diego. He was a post-doctoral fellow in Developmental Biology at the University of Chicago and a fellow in the Clinical Chemistry Training Program at Loyola University Medical Center. He is certified as a Diplomate of the American Board of Clinical Chemistry. He joined the Loyola faculty in 1981. During his 27year career in the field of clinical pathology, he has participated extensively in the training of medical technology students, medical students, pathology residents, and clinical chemistry fellows. His major research efforts have been in the areas of, ganglioside storage diseases, analytical biochemistry, oxidative tryptophan metabolism, the role of oxidative stress in gastrointestinal diseases, and peroxisome proliferator-induced carcinogenesis. His current research interests include, amyloidosis and amyloid fiber formation, the isolation and characterization of plant-derived antimicrobials, and the synthesis, characterization, and biological activities of melanins. Dr. Holmes is a member of the American Society of Clinical Pathologists, the Endocrine Society, the American Society for Investigative Pathology, the Association of Clinical Scientists, and the American Association for Clinical Chemistry. He resides in the western suburbs of Chicago with his wife, Debra and their three children. His pastimes and hobbies include trombone playing, running, gardening, home repair, and auto restoration.