



Lipophilic Curcumin Analogs and Methods of Inhibiting HIV-1, Treating Latent HIV in the Brain, Preventing HIV-mediated Cognitive Decline and HIV Dementia

Howard University researchers have developed a set of curcumin analogs and have also described novel methods of treating HIV related brain dysfunction.

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Inventor

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Benefits/Features:

Development of lipophilic curcumin analogs which can be delivered intranasally and avoid hepatic metabolism.

Potential Commercial Applications:

- The inhibition of HIV-1 replication.
- The treatment of latent HIV in the brain.
- The prevention of HIV mediated cognitive decline.
- The prevention of HIV dementia.

Stage of Development:

- Patent application filed.
- *in vitro* studies performed.
- Limited mouse studies performed.

Status:

Seeking a developing and licensing partner.

Background:

AIDS, which is caused by HIV, remains to be one of the leading causes of death worldwide. In 2011, it was reported that 1.7 million people had died from AIDS-related diseases. Currently, there are approximately over 35 million people infected with HIV. To date, greater than 30 million people have died from AIDS-related diseases. AIDS is a disease of the immune system and makes the body vulnerable to other opportunistic infections, which can result in death of an individual.

AIDS related deaths have decreased over the past 5 years due to the introduction of HAART therapy. HIV was once a death sentence, but now it has become a disease with which a person can live with for a long time. The downfall is that now patients are more susceptible to complications from other opportunistic infections. Due to this, there has been an emergence of latent HIV brain infections and associated cognitive health decline.

Description of Technology:

Research has been done on curcumin, a natural product isolated from the rhizome of *Curcuma longa*, as a possible treatment of HIV related diseases. There has not been much success with curcumin studies due to the fact that when this compound is administered orally it gets metabolized rapidly resulting in metabolites which cannot reach the brain. Lipophilic curcumin analogs have been developed, which show increased solubility and dispersibility resulting in ease of access to the brain, protecting it from HIV toxicity. Neurons are believed to be protected via increased levels of neuroprotective factors such as brain-derived neurotrophic factor (BDNF). The mode of delivery is intranasal which avoids the hepatic first pass metabolism. The olfactory nerve will deliver the analogs directly to the brain. An olfactory neuroplastic device is used along with a nasal cannula for delivery of the curcumin analogs. The device is an electrical device which is plugged into an outlet and is portable.

Opportunity:

These lipophilic analogs and their method of delivery are the subject of a patent application. Howard university is seeking a development partner to complete animal studies and initiate human studies. Dr. Nwulia is available to talk about the invention under a NDA.