



Olfactory Neuroplastic Device for Cognitive Disease Therapy

Howard University researchers has developed a device and a method of using it for improving metrics of cognitive function including verbal memory and verbal learning

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Inventors

Dr. Evaristus Nwulia
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Benefits/Features

Device provides novel, beneficial combinations of olfactory stimulants continuously for all or part of each day

Potential Commercial Applications

Treatment of persons suffering early stage Alzheimer's or other cognitive decline

Stage of Development

Thirty day trial with two healthy volunteers demonstrated feasibility. Further human trials occurring shortly.

Status

Seeking funding for expanding human trials. Collaboration or licensing opportunity.

Background

Cognitive decline associated with Alzheimer's disease is often preceded by loss of olfactory sensation, leading to a hypothesis that response to olfactory cues can be not only diagnostic but also deterministic of Alzheimer's progression.

Description of Technology

Dr. Nwulia and Dr. Segun have developed a device which can deliver novel combinations of stimulative aromas to patients who are suspected of suffering from early cognitive decline. Termed an Olfactory Neuroplastic Device or OND, the device comprises a mechanical pump providing olfactory combinations to a cannula in the patient's nose. It is portable and can be used for part or all of the day. The device has been shown to improve verbal cognitive skills in two healthy volunteers, which is in contrast to conventional aromatherapy methods, which have not been shown to improve cognitive function. Consistent use of the method and device over multiple weeks resulted in measurable improvements of verbal memory and verbal learning. The researchers plan to study a larger sample of volunteers with early cognitive decline in the second half of 2012.

Opportunity

The device, the olfactory stimulant combinations and methods of using them are the subject of a patent application. The covered method includes multiple therapeutic and drug efflux inhibitor combinations. Howard University is seeking a development partner to further characterize compound combinations, and to partner in initial human studies. Dr. Nwulia is available to talk about the invention under a NDA.



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.