



Treating HIV-1 by Reducing Host Susceptibility

The Technology

Human immunodeficiency virus-1 (HIV-1) is a debilitating disease which currently infects millions of people globally. In 2007 alone, there were approximately 2.5 million new infections, and another 2.1 million succumbed to the disease worldwide. With a constant increase in patient numbers and the development of drug resistance in current HIV therapy, there is a continuous need for new HIV drugs and new classes of HIV drugs.

Researchers at the University of Tennessee Health Science Center have discovered that novel small molecule compounds can inhibit the expression of CXCR4, a critical receptor for HIV-1 infection of human T-cells. They have shown that this inhibition of CXCR4 is independent of the expected pathways for these compounds. HIV-1 is highly variable and has a high mutation rate, leading to drug resistance and making it difficult to treat. Targeting CXCR4 as a method of treating HIV-1 infection circumvents the problem of drug resistance because these compounds target the host cell and not the virus itself. The researchers have extensively characterized the lead compound and synthesized a unique highly active analog. They seek to develop more compounds in this novel class of small molecule compounds.

During their study of the small molecule compounds on CXCR4 expression, the researchers serendipitously discovered that another compound used as a negative control and previously believed to be inactive was also able to inhibit CXCR4 expression. This compound is structurally different from the first series of compounds under investigation. The researchers seek to screen for additional compounds that have the potential to elicit a comparable response to CXCR4.

These promising results demonstrate the existence of small molecule compounds capable of reducing CXCR4 expression by at least 85%, which should prevent HIV-1 from invading healthy T-cells.

Benefit

- Opportunity to create two new classes of HIV drugs.
- FDA approval should be less complicated due to extensive safety profile of lead candidate.
- Circumvent drug resistance by targeting host instead of highly variable virus.

The Inventors

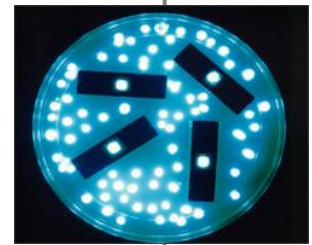
Dr. Burt Sharp is a Professor and Chairman in the Department of Pharmacology at the University of Tennessee Health Science Center. His research has mainly focused on the basic neurochemistry and molecular neurobiology of nicotine and cellular and biochemical approaches to understand the action of opioid peptides on the immune system.

Identifying, managing and licensing intellectual property from The University of Tennessee

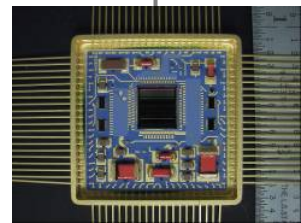
AGRICULTURE



BIOTECHNOLOGY



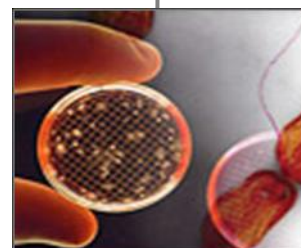
ENGINEERING



MATERIALS



MEDICINE





UNIVERSITY OF TENNESSEE **RESEARCH FOUNDATION**

<http://utr.f.tennessee.edu>

Dr. Bob Moore is an Associate Professor in the College of Pharmacy at the University of Tennessee Health Science Center. His research integrates synthetic organic chemistry, computational chemistry and biological assays aimed at developing new chemotherapeutic entities. Some of his current areas of research include development of cannabinoid receptor (CB1 and CB2) agonist and antagonist and the development of novel therapies for combat casualty care with emphasis on hemorrhagic shock and hemostasis.

Patents

Not yet filed.

Contact

The University of Tennessee Research Foundation (UTRF) is a non-profit corporation responsible for commercializing University of Tennessee technologies and for supporting University research. UTRF is seeking parties interested in learning more about this technology and in exploring possible research and/or commercialization arrangements.

Lakita Cavin, J.D., Ph.D.

Staff Attorney/Licensing Associate

Ph: (901) 448-7825

Fax: (901) 448-2111

E-mail: lcavin@utmem.edu

Reference: PD 08089 and PD 09027