Non-Invasive Agents and Methods of Diagnosing Infectious Disease

The University of New Mexico, Radiopharmaceutical Sciences
Inventor: Jeffrey P. Norenberg, PhD

(STC Ref. 2008-104)

Background

The immune response to many infectious diseases and inflammatory conditions are mediated by Leukocyte Function-Associated Antigen-1 (LFA1), which is expressed on leukocytes or white blood cells. The interaction between LFA1 and Intracellular Adhesion Molecule-1 (ICAM-1) is an important event in cell signaling of inflammation and immune cell-mediated diseases. Binding of LFA1 with ICAM-1 results in leukocyte adhesion and migration, and stimulates intracellular signals responsible for cytotoxic action, cell proliferation, and apoptosis. Bacteria, viruses, fungi, and parasites that give rise to infectious diseases are known to elicit LFA1-mediated signaling events which result in white blood cell recruitment and sequestration, thus resulting in a much higher frequency of LFA1: ICAM-1 interactions.

Currently, the methods for staging and detecting infectious diseases are very crude and often rely on tissue biopsy for diagnosis. Non-invasive, molecular targeted imaging agents that elucidate the pathobiology of infection are lacking. There is a critical need to develop imaging agents that can diagnose and/or monitor infections in tissues of patients.

Technology Breakthrough

This novel invention allows molecular imaging of LFA1 signaling to identify infections using non-invasive molecular imaging. Specifically, this probe is composed of a small molecule targeting LFA1 expression. When a radioisotope is incorporated into this probe, it can be used as a diagnostic tool to identify the existence of a disease, the extent of the disease, and can be used to monitor therapy. When this probe is alternatively coupled with a pharmaceutical agent such as an anti-cancer, anti-microbial, or anti-bacterial agent, it can be used as a therapeutic to treat an infectious disease or condition. This technology represents a significant advance and a major step forward in the diagnosis and treatment of infectious disease using non-invasive molecular imaging and targeting techniques.

Key Advantages

- *Provides major advancement in infectious disease diagnosis, characterization, monitoring, and therapy*
- *Non-invasive approach; does not rely on tissue biopsy for diagnoses of disease states and conditions*
- *Diagnosis of infectious diseases using this molecular-targeted probe significantly advances the currently available diagnostic strategies*
- *Many diseases and conditions can be diagnosed and/or treated using these novel probes including, cardiovascular diseases, gastrointestinal inflammatory conditions, degenerative joint diseases, urinary tract infections, parasitic diseases, respiratory tract infections, and many other conditions*

IMAGE

Intellectual Property

Issued U.S. Utility Patent 8,623,322
Issued U.S. Divisional Patent 9,352,059

Contact

For more information, contact Arlene Mirabal, Marketing Operations Coordinator, STC.UNM at amirabal@stc.unm.edu or (505) 272-7886.

Visit STC.UNM at www.stc.unm.edu.

STC.UNM
SUPPORTING TECHNOLOGY TRANSFER AND CATALYZING ECONOMIC DEVELOPMENT AT THE UNIVERSITY OF NEW MEXICO