Peptide and Small Molecule Inhibitors of the Interaction of ICAM-1 with LFA-1

Published date: June 26, 2014

Technology description

Treatments for Leukemia, psoriasis, transplant rejection and inflammatory diseases such as ischemia-reperfusion injury, stroke, septic shock and rheumatoid.

Background

Cell surface proteins play an important role in the immune and inflammatory process. Adhesion of leukocytes (white blood cells) to intercellular adhesion molecule-1 (ICAM-1) via the leukocyte function-associated antigen (LFA-1) is required for proper inflammatory and immune function. Inhibition of ICAM-1/ LFA-1 binding has been shown to safely and effectively moderate lymphocyte function in various animal models of human diseases (references 5-7) including leukemia and inflammatory diseases such as ischemia-reperfusion injury, stroke, septic shock and rheumatoid arthritis.
We have developed several peptides (see our US Patent 6,649,592 B1) and a newly patented group of small molecules which block the ICAM/LFA interaction and show potential for therapeutic application. The safety and efficacy observed in these studies has validated LFA-1 as a therapeutic target of interest to the pharmaceutical industry.

Technology Description

Cyclic peptides inhibit LFA-1 interaction with ICAM-1 and are useful in treatment of hematopoietic neoplasms and in adjunct therapy in prevention of retinoic acid syndrome and diseases involving emigration of leukocytes into organ tissue. These small cyclic peptides have been developed that inhibit ICAM-1-dependent cell aggregation and adhesion. Further, these peptides show no sequence homology to the ICAM-1 ligand, LFA-1. The peptides were identified by phage display or inverse QSAR, and have been shown to have in vivo activity. The tertiary structures of the more potent compounds have been determined and may serve as a guide for future non-peptide organic drug candidates.
In addition to our peptide library, we have used cheminformatics tools to design and synthesize small organic molecules that inhibit ICAM-1-dependent cell aggregation and adhesion and block the ICAM/ LFA interaction.

Publications

J Mol Graph Model. 2004 Mar; 22(4):263-73.
J Pept Res. 2003 Sep;62(3):97-116.
Am J Physiol Heart Circ Physiol. 2003 Apr;284(4):H1260-8. Epub 2002 Dec 19.
J Pept Res. 2001 Aug;58(2):140-50

About STC.UNM

As the technology-transfer and economic-development organization for the University of New Mexico, STC.UNM protects and commercializes technologies developed at the University of New Mexico (UNM) by filing patents and copyrights and transferring the technologies to the marketplace. We connect the business communication (companies, entrepreneurs and investors) to these UNM technologies for licensing opportunities and the creation of startup companies. Visit www.stc.unm.edu.

Application area

Due to their small size and ability to block cell-cell adhesion, these peptides and compounds may serve as useful tools for study of ICAM-1 and LFA-1 biology as well as for the development of small molecule therapeutics for treatment of lymphomas and/or inflammatory diseases such as rheumatoid arthritis, reperfusion injury of tissue due to cardiopulmonary bypass, and inflammatory bowel disease.

Institution

The University of New Mexico

Inventors

Richard Larson

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com