

Inflammatory Diseases of the Nervous System

A new therapeutic strategy



BACKGROUND

Immune cell migration to the central nervous system (CNS) is the leading cause of cerebral inflammation. In Multiple Sclerosis, inflammatory demyelinating lesions are associated with a compromised blood-brain barrier (BBB) and with perivascular infiltration of immune cells into the CNS.

The movement of leukocytes from the blood to the CNS is orchestrated by many factors, including cell adhesion molecules that enable immune cells to adhere and cross the BBB.

Dr. Alexandre Prat and his team at the CHUM-Research Centre demonstrated that the blockade of adhesion molecule Ninjurin-1, expressed on the surface of BBB-endothelial cells, restricts monocyte, macrophage and dendritic cell migration towards the brain.

INTELLECTUAL PROPERTY

USPR, CA, AU PATENT APPLICATIONS
Priority date Q2/2009

KEYWORDS

Therapeutic Target, Inflammatory Diseases, Multiple Sclerosis

TECHNOLOGY

A new diagnostic marker, inhibitor, and therapeutic target for inflammatory diseases of the CNS and the peripheral nervous system (PNS).

DEVELOPMENT STATUS

Validated target

A lead compound (peptide)

In vitro, *in situ* and *in vivo* experiments showed that Ninjurin-1 is an adhesion molecule of the BBB, and plays an important role in the recruitment of myeloid cells to the inflamed CNS.

Peptides were designed to target and block human and mouse Ninjurin-1. In an experimental human BBB model, *in vitro* studies using the peptides reduced the migration of myeloid cells across the cerebral endothelium. Two different murine models of neuroinflammation were used for the *in vivo* studies. The lead peptide decreased myeloid cell infiltration into the CNS, reduced tissue damage, and delayed the onset of clinical signs of the disease.

APPLICATION

Treatment of inflammatory diseases of the CNS or the PNS, such as Multiple Sclerosis (MS).

OPPORTUNITIES

This discovery is important because myeloid cells are considered "conductors" of inflammatory reactions, promoting lymphocyte proliferation and actively participate in tissue destruction.

- Neuroinflammatory diseases, whether autoimmune or traumatic, represent an economic burden of over 10B\$ in North America.
- More than 600,000 MS patients are currently diagnosed and treated in specialized neurology clinics in the USA and Canada.
- The currently available drugs reduce the activity and the severity of the disease by about 30% in approximately 60% of patients.

Development plan would include:

- Peptide optimization and development of new peptide inhibitor analogues (or other types of inhibitory molecules);
- Further preclinical studies.



VAL-737-CHUM
(Dr Prat's [website](#))

Contact info:

Anne-Marie Larose, PhD, MBA
Business Development Manager
Gestion Univalor, LP
Tel : 1-514- 340-3243 Ext. 4239
Fax : 1-514-340-3204



UNIVALOR

Bridging Knowledge and the Economy