Technology Offer

Reference Number
TO 02-00089

MALP-2-based Modulation of Dendritic Cells for Stimulation of Th1 Immune Response

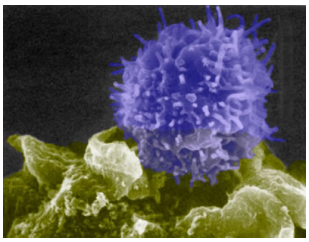
The Challenge

Dendritic cells are the most important antigen-presenting cells of the immune system. In principle, two types of immune response can be distinguished; a) the cytotoxic Th1-mediated reaction and b) the Th2-immune response induced by antibodies, whereas the later one rather tends to provoke allergic reactions. For therapeutic purposes, the controlled generation of a Th1-type immune response is desired, e.g. for the defence of tumors and viruses or for the treatment of severe allergic reactions. However, a central problem is to influence dendritic cells to selectively induce a Th1-type immune response.

The Technology

The MALP-2 lipopeptide (macrophage activating lipopeptide-2) isolated from *Mycoplasma fermentans* modulates the activity of antigen processing cells. Among othet effects, it stimulates murine as well as human macrophages and monocytes to liberate cytokines and prostaglandines and to induce a high titer of chemokines in vivo. MALP-2 is a ligand for the 'toll-like receptor 2'.

In combination with interferon γ, MALP-2 biases dendrictic cells to preferrently induce a Th1-type immune response.



T Cell (blue) binding a Dendritic Cell (green).
Source: Lawrence Berkeley National Laboratory

Commercial Opportunity

The generation of a Th1-type immune reaction is of prime importance in a variety of therapeutic fields. Immunotherapy via pre-treated dendritic cells is more and more considered to be a promising strategy especially for the treatment of various types of cancer, infections, allergies and autoimmune diseases. Already to date, clinical trials (PhaseI/II) for the treatment of cancer are on-going with pre-treated dendritic cells (loaded with either antigen or nucleic acids) being used to stimulate the immune system.

The advantages are:

- Handy and easy possibility to influence dendritic cells in a way that they induce a Th1-type immune response
- Availability of a high potential substance, the macrophage activating lipopeptide MALP-2, for development of new innovative therapeutic products in the field of immunotherapy
- Easy and reproducible isolation of natural macrophage activating lipopeptide; synthetic macrophage activating lipopeptide available by simple chemical synthesis

Patent situation

Pending European patent application filed at EPO 2003, international application (PCT) will follow.

Further Reading

Weigt H. et al. Immunobiology. 2003;207(3):223-33.

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