

Long Term Maintenance of Lymphocytes *in vitro*

Background

Normal un-stimulated human peripheral T lymphocytes have numerous pharmacological, diagnostic and research applications. Examples include the study of T cell biology and HIV infection of T cells, and gene therapy applications. Maintenance of T lymphocytes *in vitro* requires the activation of T cells with either an antigen or mitogen followed by expansion of the cells with cytokines. However, the T cells maintained in this fashion are often specific for a particular antigen and are not suitable for studying T cell biology. **The present invention provides a culturing system for the long-term maintenance of primary resting T lymphocytes *in vitro* without the requirement for stimulation with cytokines or antigens.**

Description of the Technology

UMDNJ scientists have developed an *in vitro* culture system for the long-term maintenance of primary, human peripheral blood and umbilical cord blood T lymphocytes. This system does not require the use of stimulatory factors such as cytokines, antigens or mitogens. Briefly, the procedure involves the development of a monolayer of adherent cells from human peripheral blood or umbilical cord blood that can support the maintenance of non-adherent resting mature T cells. The adherent cells, some resembling macrophages, can be developed within a week of starting the culture and can support the maintenance of resting mature T cells for up to three months. These adherent cells are positive for cell surface markers such as MHC class II, PECAM I (CD31), and E-selectin (ELAM-1, CD62E) and proteins such as laminin and fibronectin but are negative for CD45, CD14, muscle-specific actin and Factor VII-related antigen. The T cells maintained in the culture system of the present invention retain the ability to respond to mitogens and allogeneic cells and both CD4+ and CD8+ T cells could be maintained *in vitro* for up to three months. Furthermore, the T cells maintained this way could be used as targets in retroviral mediated gene transfer indicating that these cells could be used in gene therapy applications.

Advantages

- Provides a continuous supply of non-stimulated T lymphocytes for pharmacological, diagnostic, gene therapy and research applications.

Applications

- For the long term maintenance of primary, human peripheral blood and umbilical cord blood T lymphocytes
- To study HIV infection of T cells
- For research applications
- For pharmacological, clinical and diagnostic applications

Patent Status

- United States patent granted on November 18, 1997
- Patent Number: 5,688,915

Licensing Opportunity

This technology is available for licensing non-exclusively.

Peter Golikov, MS, MBA
Director, Ventures and Licensing
University of Medicine and Dentistry of New Jersey
335 George Street
New Brunswick, NJ 08901
Direct Phone: (732)-235-9355
Main Office Phone: (732)-235-9350
Facsimile: (732)-235-9358
golikope@umdnj.edu

File RWJ 93-43/Ron & Dougherty