AzTE Arizona Technology Enterprises

www.azte.com

Methods for Production of Immune System Tissue Equivalents in Low Sedimental Fluid Shear Conditions

AzTE Case # M11-022

Inventors

Cheryl Nickerson
Associate Professor
Center for Infectious Diseases and Vaccinology
The Biodesign Institute
Arizona State University

Aurelie Crabbe
Postdoctoral Research Associate
Center for Infectious Diseases and Vaccinology
The Biodesign Institute
Arizona State University

Invention Description

Cell culture is an indispensible tool in many fields including cell biology, immunology, microbiology, cancer and infectious disease research. However, conventional two-dimensional culture, which involves growing cells as monolayers on solid, impermeable surfaces, may lead to the loss of key phenotypic and functional cell characteristics, and often does not predict *in vivo* tissue responses.

Researchers at the Biodesign Institute of Arizona State University have developed a novel method to produce three-dimensional, physiologically relevant immune tissue systems. The low sedimental fluid shear environment produced in a rotating wall vessel (RWV) bioreactor enables construction of 3-D tissue systems that display both structural and functional characteristics similar to *in vivo* human tissues, including immunocompetency.

This technology bridges the gap between the inherent limitations of conventional cell culture and animal models to better predict *in vivo* human responses to pathogens, toxins, drugs, vaccines, etc. Such 3-D co-culture immunocompetent models provide unique insight that other *in vitro* models cannot.

Potential Applications

- Greatly improved predictive capability of tissue culture models to mimic human and patient-specific responses
- Replacement of some animal and human clinical testing
- Personalized medicine
- Better prediction of *in vivo* human responses to pathogens, toxins, drugs and other therapeutics, vaccines and adjuvants, chemotherapeutic agents, cosmetics and other chemicals
- Identification of risk biosignatures for transition from normal homeostasis to disease

Benefits and Advantages

- Provides more accurate analog of human response than other cell culture techniques.
- Immunocompetency and 3-D structure of tissue bridges the gap between conventional *in vitro* cell culture and *in vivo* models

Intellectual Property Status:

Provisional Application Filed

Contact

Jack Geltosky, PhD

Senior Vice President

Business Development, Life Sciences

Arizona Technology Enterprises, LLC (AzTE)

P: 480.884.1989

F: 480.884.1984

JGELTOSKY@AZTE.COM

HEALTHSCIENCES@AZTE.COM