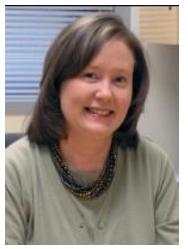# MEDICINE by DESIGN

Engineering Discoveries at the Convergence of Biological Design

SPEAKER SERIES

DATE: Friday January 13th, 2017

TIME: 11 am to 12 pm

LOCATION: Red Room, 160 College Street, Donnelly Centre

Medicine by Design is pleased to host a talk by **Dr. Julia Babensee** from the Wallace H. Coulter Department of Biomedical Engineering at the Georgia Institute of Technology and Emory University in Atlanta, Georgia. Her talk will focus on:

"Immunomodulation strategies using biomaterials."

Talk Abstract:

Controlling host inflammatory/immune responses through biomaterial-based approaches are offering unique strategies for preventing infectious disease, enhancing immune acceptance in regenerative medicine, contributing to tissue repair, promoting immunity for tumor eradication and intervention in autoimmune disease. Central to achieving this is a need to control the balance of pro-inflammatory and tolerogenic immune states. Furthermore, antigen specificity is a goal in suppression of auto-/allo-reactive T cells and induction of Tregs. Dendritic cells (DCs) express a spectrum of phenotypic states from pro-inflammatory to tolerogenic in response to microenvironment stimuli making them useful in determining immunological outcomes. Results from three approaches of DC/biomaterial-based immunomodulation will be discussed, as per below. These complementary approaches are being applied for amelioration of autoimmune diseases [e.g. multiple sclerosis (MS) or type 1 diabetes] and for immune acceptance of allogeneic islets for diabetes treatment.

1. Effect of a biomaterial itself on resultant DC phenotype
2. Utilizing biomaterials to deliver cues for in situ education of recruited DC precursors using controlled release of immunomodulators and antigen from an implanted multifunctional immunomodulatory (MI) biomaterial construct
3. Pre-programming DC phenotype in culture to be immunosuppressive and antigen-specific prior to their delivery within an injectable polyethylene glycol (PEG) hydrogel

Light refreshments will be served.

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