Assistant Professor

Phone: 744-5280

Email: heather.fahlenkamp@okstate.edu

ACADEMIC BACKGROUND

Ph.D., Chemical Engineering, Oklahoma State University, 2003

M.S., Bioengineering, University of Utah, 2000

B.S., Chemical Engineering, Oklahoma State University, 1997

MAJOR AREAS OF INTEREST

Tissue Engineering: 3D In Vitro Vascular Tissue Constructs

Bioreactors: Generation of Dendritic Cells

Drug Delivery: Nanoparticles and Biomembranes for Controlled Delivery

RECENT RESEARCH ACTIVITIES

A 3D Vascular Tissue Model for Studying the Link Between Diabetes and Atherosclerosis

We are using a 3D human in vitro tissue model that recapitulates the interface between a blood vessel and the surrounding tissue to investigate the effect of high glucose concentrations on both endothelial cell behavior and leukocyte trafficking and differentiation.

A 3D human Tissue Model for Screening Potential Diabetic Macular Edema Therapeutics

We are using a 3D retinal angiogenesis model to accurately measure inflammatory responses and vascular leakage associated with diabetic macular edema within all three dimensions of the model. This tissue model is being developed in collaboration with Charlesson, LLC to test their newly developed DME therapeutics.

A Novel Ophthalmic Drug Delivery System for the Treatment of Diabetic Retinopathy

To improve sustained delivery of drugs to the eye, we have designed a novel system that includes drug-loaded nanoparticles suspended within a thin membrane that can be attached to a standard commercial-grade contact lens for support. The lens system will provide constant contact with the eye's surface and the particles will supply a continuous release of medication, resulting in more drug reaching the target.

RECENT PUBLICATIONS

Gappa-Fahlenkamp, H., R. Hale, and A. Shukla."Optimization of a 3D Vascular Tissue Model for the In Vitro Generation of Human Dendritic Cells."Cellular Immunology, submitted, 2010.

Gappa-Fahlenkamp, H., and S. Sofolahan."Characterization of a Novel 3D Angiogenesis Tissue Model."Microvascular Research, submitted , 2010.

Leemasawatdigul, K., and H. Gappa-Fahlenkamp."Effect of Storage Conditions on the Stability of Recombinant Human MCP-1/CCL2.Biologicals, submitted, 2010.

Leemasawatdigul, K., and H. Gappa-Fahlenkamp. “Development of a Mathematical Model to Describe the Transport of MCP-1 Through a Three-dimensional Collagen Matrix.” Annals of Biomedical Engineering, submitted, 2010.

Gappa-Fahlenkamp, H., M. Sharma, P. Ashok, and R. Subramanian.“Characterizatioon of a Novel Ophthalmic Drug Delivery System.”Journal of Controlled Release, submitted, 2010.

Leemasawatdigul, K., and H. Gappa-Fahlenkamp. “The Formation of Concentration Gradient of Static MCP-1 in the Collagen Matrix of a 3D In Vitro Human Vascular Tissue Model and its Haptotactic Effect on the Monocyte Migration.” Biochemical and Biophysical Research Communication, submitted, 2010.

Higbee, R. G., A. M. Byers, V. Dhir, D. Drake, H. Gappa-Fahlenkamp, J. Gangur, A. Kachurin, O. Kachurina, D. Leistritz, Y. Ma, R. Mehta, E. Mishkin, J. Moser, L. Mosquera, M. Nguyen, R. Parkhill, S. Pawar, L. Poisson, G. Sanchez-Schmitz, B. Schanen, I. Singh, H. Song, T. Tapia, W. Warren, and V. Wittman. “An Immunologic Model for Rapid Vaccine Assessment – a Clinical Trial in a Test Tube.”Alternatives to Laboratory Animals, 37(Suppl 1) 19, 2009.

Gappa-Fahlenkamp, H., and A. Shukla. “The Effect of Short-term, High Glucose Concentration on Eendothelial Cells and Leukocytes in a 3D In Vitro Human Vascular Tissue Model.” In Vitro

Cellular and Developmental Biology, 45 (5-6) 234-242, 2009.