1073-92-84 **Maria P McGee*** (mmcgee@wfubmc.edu), Medical Center Blvd, Surgical Sciences Division, Plastic and Reconstructive Surgery Department, Winston-Salem, NC 27101. *Describing transport processes in biological systems:An example from blood coagulation kinetics.* Preliminary report.

Biological systems are characterized by change. The equations of biological change are based on physical laws for the conservation of mass, momentum and energy and generally intent to describe concentration, velocity and temperature as a function of two independent variables, time and position. Partial differential equations are valuable to understand dynamics in bio-molecular systems when used to model conditions not directly accessible by experiment and to test hypotheses enunciated on the basis of limited experimental or clinical information. The coagulation of blood is an important biological process where differential equations have played a role in determining mechanisms and predicting outcomes. The process is initiated by macromolecular reactions assembled on surfaces and requires transfer and exchange of reactants and products between the blood and the catalytic surface. In this report, the use of reaction-diffusion equations to complement experimental and theoretical biomedical research will be illustrated by comparing predicted and measured rates of coagulation factor Xa generation on the membrane of live cells. The simplified assumptions of the mathematical model are exploited to identify variables, explain results and design new experiments. (Received July 27, 2011)