1073-92-250 **Karen M. Bliss*** (kmbliss@ncsu.edu), **H. T. Banks**, **H. T. Tran** and **Peter Kotanko**. *Model and Simulation of Red Blood Cell Dynamics in Patients with Chronic Kidney Disease.* Preliminary report.

Kidneys are the main site of production of the hormone erythropoietin (EPO) that is the major regulator of erythropoiesis, or red blood cell production. EPO level is normally controlled by a negative feedback mechanism in the kidneys, but patients with chronic kidney disease (CKD) do not produce sufficient levels of EPO to maintain blood hemoglobin concentration.

In order to prevent anemia, patients typically receive recombinant human EPO (rHuEPO) intravenously to stimulate red blood cell production. Iron is required to produce hemoglobin, and iron deficiency can be an issue among patients receiving rHuEPO therapy, so intravenous iron supplementation is common among patients undergoing rHuEPO therapy. Iron availability is negatively affected by inflammation level in the body.

An age-structured model is developed for red blood cell dynamics in patients with CKD. Both rHuEPO therapy and iron therapy are taken into consideration, as is the overall inflammation level in the body. Simulations are performed under various conditions and treatment protocols.

This is joint work with H.T. Banks and H.T. Tran of the Center for Research in Scientific Computation at North Carolina State University, along with Peter Kotanko of Renal Research Institute in New York. (Received August 02, 2011)