1023-92-1295   **Saziye Bayram*** (`bayrams@buffalostate.edu`), 329 Bishop Hall, Buffalo State College, 1300 Elmwood Avenue, Buffalo, NY 14222. *Dynamics of Closely Coupled Nephrons.*

A human kidney contains approximately one million nephrons, the basic functional unit that filters blood into urine. The functional state of a nephron in a normotensive rat is experimentally characterized as either steady or as limit-cycle oscillations (LCO). The oscillatory behaviors in nephrons' flows are mediated by a negative feedback system known as tubuloglomerular feedback (TGF).

Many mathematical models of control exhibit oscillatory solutions; oscillations are also a feature of delay differential (or integral) equations. In this talk, we present the modeling of closely coupled nephrons using these mathematical tools, and discuss its mathematical analysis and results obtained from bifurcation analysis and numerical simulations. (Received September 25, 2006)