1116-VM-1623 **Brendan C. Fry*** (brendan.fry@colorado.edu). *Impact of kidney structural architecture on oxygen transport: A mathematical model.*

A theoretical model is presented to analyze the impact on oxygen distribution of the heterogeneous organization of the inner part of the rat kidney – called the medulla – revealed in anatomical studies. Model PDEs are based on active and passive transmural transport processes, as well as conservation of water and solutes (NaCl, urea, O_2, HbO_2, Hb), and are solved to steady state. Results of the model suggest that the structural organization of the renal medulla produces marked axial and radial tissue PO_2 gradients. In addition, the heterogeneous structure preserves oxygen delivery deep into the kidney, but significantly increases the likelihood of O_2-limiting tissue injury. (Received September 20, 2015)