Department of Biochemistry and Molecular Biophysics Seminar

Wednesday, March 25 at 4:00 p.m. in Ackert 120

Coffee and cookies at 3:45 p.m. in Chalmers 168

Dr. David Poole, University Distinguished Professor

School of Health Sciences and Dept. of Anatomy and Physiology
Kansas State University

Muscle Oxygen Transport: Misconceptions and Missed Perceptions

Each minute, during maximal exercise, our O_2 transport system - lungs, cardiovascular, active muscles - transports and utilizes over 100 sextillion (10^{21}) O_2 molecules. In skeletal muscles, this O_2 must move from the microcirculation (capillaries) to mitochondria: Powering cellular energetics and muscle contractions. This prodigious blood-tissue interface is, *in toto*, around the size of a tennis court and its dysfunction underlies the pathophysiology of many diseases including heart failure, diabetes, sepsis, stroke and senile dementia. Effective therapeutic design demands knowledge of microvascular/capillary function in health to recognize and combat pathological dysfunction. This presentation unveils the state-of-the art in this dynamic field including: 1. Putative roles of red blood cell aquaporin and rhesus channels in determining tissue O_2 diffusion. 2. Recent discoveries regarding intramyocyte O_2 transport. 3. Developing a comprehensive capillary functional model for muscle O_2 delivery-to-O_2 utilization matching. 4. Use of kinetics analysis to discriminate control mechanisms.