Metabolic-vascular coupling: pericytes regulate capillary blood flow

D. Premilovac, E. Attrill, N. King, L. Brown and B. Sutherland, School of Medicine, College of Health and Medicine, University of Tasmania, TAS 7001, Australia.

In all tissues, it is critical to be able to match local capillary blood flow to the metabolic rate of the cells within the tissue to ensure appropriate delivery of nutrients and the removal of waste products. This relationship is particularly important in tissues where local metabolism, and hence blood flow can vary widely, such as the brain and skeletal muscle, as inadequate local blood flow or a mismatch between nutrient demand and supply will directly compromise normal function. While the consequences of this metabolic-vascular mismatch can manifest acutely in the brain (*e.g.* stroke), in skeletal muscle this can lead to reduced postprandial glucose disposal contributing to disturbances in whole body metabolism. Importantly, how the needs/signals from local tissue metabolism are sensed and integrated by the vascular tree to facilitate increased capillary blood flow remains poorly understood. We have new data that hightlights the contribution of pericytes, contractile cells that encircle and cover capillaries, as potential integrators and regulators of capillary blood flow in normal health and disease states such as stroke and insulin resistance.