

Microcirculation Modeling for Diagnosis and Treatment

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Mini-symposium proposal

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Microcirculation is a fundamental part of cardiovascular system because it is responsible for mass transfer from blood to organs. There has been an increasing interest in using microcirculation as a marker for cardiovascular health and metabolic functions, as it may be related to the development of instruments for detecting a variety of pathological processes in the circulatory system¹. Investigations have revealed a correlation of vascular reactivity in different vascular beds for healthy people and patients².

On the other hand, understanding microcirculation in tumors is extremely important for targeted drug delivery as the anti-cancer agents reach cancer cells via distribution through the vasculature, transport across the wall of vessels and transport through the tissue interstitium. Blood vessels in tumors are leakier and more tortuous than the normal vasculature, which lead to an impaired blood supply and abnormal tumor microenvironment².

Mathematical models via different approaches help to understand and quantify the main mechanisms of the fluid and transport phenomena. There are a variety of modeling studies for microcirculation focusing on blood flow, oxygen transport, drug delivery, and vascular endothelial growth factor (VEGF) et al for the past decade.

The mini-symposium will primarily focus on the development of computational simulations of fluid flow and mass transport in microcirculation, especially for early detection of vascular complications of diabetic mellitus and tumor treatment. We will also welcome presentations from experimental measurements of microcirculation so that the speakers can exchange their ideas each other and further find collaboration opportunities.

.References:

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