This letter is in response to the Point-Counterpoint series “The muscle pump is/is not an important determinant of muscle blood flow during exercise” that appeared in the July issue (vol. 99: 371–375, 2005; doi:10.1152/japplphysiol.00381; http://jap.physiology.org/content/vol99/issue1/2005).

The muscle pump debate: selective literature representations

Letter to Editor: This point-counterpoint debate illustrates that “selective” representations of the literature result in compelling arguments for diametrically opposed views of physiological function. These debates have value in stimulating discussion. Warning to readers! Such arguments are intended to persuade us of the respective author’s viewpoint, not necessarily define the underlying reality. The following considerations are suggested for readers to investigate further in the literature. There are two different issues regarding muscle pump contribution to exercise hyperemia (EH): 1) explaining the rapidity of the EH response at exercise onset, 2) explaining the peak EH. Regarding the former, Sheriff’s argument concerning inadequate response speed and magnitude of vasodilation is now outdated and needs to be dropped from the debate. Recent in situ microvascular videomicroscopy data (3) definitively demonstrate immediate and substantial vasodilation after a single brief (fraction of a second) contraction. Regarding the latter, Clifford and colleague’s data (1) demonstrating no net gain in flow with the onset of locomotion in a vasodilated state masks the fact that EH between contractions was enhanced in that experiment. A net increase in EH with contractions relative to vasodilation alone at lower (2) but not higher (1, 2) exercise intensities in their and other’s studies indicates 1) necessary consideration of contraction impedance in the muscle pump effect on EH and 2) the acknowledgement that muscle pump EH enhancement may very well be dependent on the exercise modality. Surprise, surprise…mechanism contribution is dependent on the nature of the exercise! I submit that as the concluding truth in this and all debates of this nature.

REFERENCES


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