Microvascular NADPH Oxidase in Health and Disease

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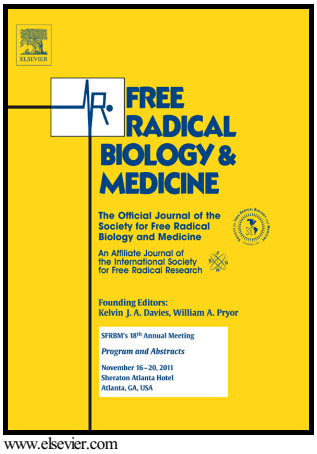

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Abstract

The systemic and cerebral microcirculation contribute critically to regulation of local and global blood flow and perfusion pressure. Microvascular dysfunction, commonly seen in numerous cardiovascular pathologies, is associated with alterations in the oxidative environment including potentiated production of reactive oxygen species (ROS) and subsequent activation of redox signaling pathways. NADPH oxidases (Nox) are a primary source of ROS in the vascular system and play a central role in cardiovascular health and disease. In this review, we focus on the roles of Noxs in ROS generation in resistance arterioles and capillaries, and summarize their contributions to microvascular physiology and pathophysiology in both systemic and cerebral microcirculation. In light of the accumulating evidence that Noxs are pivotal players in vascular dysfunction of resistance arterioles, selectively targeting Nox isozymes could emerge as a novel and effective therapeutic strategy for preventing and treating microvascular diseases.