Methods of Preventing Tissue Ischemia

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Technology description

Summary

Nitric oxide (NO) plays an important role as a major intrinsic vasodilator, and increases blood flow to tissues and organs. Disruption of this process leads to peripheral vascular disease, ischemic heart disease, stroke, diabetes, and many more significant diseases.
Researchers at the NIH have discovered that the matrix protein thrombospondin-1 blocks the beneficial effects of NO, and prevents it from dilating blood vessels and increasing blood flow to organs and tissues. Additionally, the inventors discovered that this regulation requires interaction with thrombospondin-1’ s cell receptor CD47. Murine studies revealed that, in the presence of NO, genetically altered mice, lacking either thrombospondin-1 or CD47, showed dramatically improved blood flow and tissue oxygenation. The inventors have also shown in both mice and pigs that by targeting thrombospondin-1 and/or CD47, blood flow can be dramatically increased to ischemic tissues. The same therapeutics also were found to protect tissues from ischemia/reperfusion injury.

Application area

Potential therapeutics for precise regulation of blood flow to tissues and organs.
Efficient methods to increase tissue survival under conditions of trauma and surgery.
Efficient methods for the treatment of elderly subjects using agents that affect thrombospondin-1 and CD47 and thereby affect tissue perfusion.
Methods for treatment of ischemia/reperfusion injury as associated with transplant surgery.

Institution

NIH - National Institutes of Health

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