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BIDMC 799: Gene Therapy Approach for Treatment of Angiogenic Disorders

➤ RTEF as a “master switch” regulator of angiogenesis

Several mediators are known to regulate angiogenesis and have been proposed as therapies to either promote or inhibit vascularization for the treatment of angiogenic disorders. With its receptor expressed almost exclusively on vascular endothelial cells, vascular endothelial growth factor (VEGF) is one of the most promising angiogenic mediators targeted for such therapeutic purposes.

The ability to specifically regulate angiogenesis, however, remains a significant challenge. The half-life of VEGF is extremely short and systemic administration can induce angiogenesis with negative side effects.

The inventors have discovered that Hypoxia-induced Related Transcriptional Enhancer Factor-1 (RTEF-1) induces the expression of VEGF, Fibroblast Growth Factor Receptor (FGFR) and COX-2 in vascular endothelial cells with the potential to mediate either the promotion or inhibition of angiogenesis in that tissue.

Stage of Development:

Proof of concept demonstrated in bovine aortic endothelial cells in culture. Animal experiments are planned.

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Commercial Opportunity:

- ✓ Promotion of angiogenesis for treatment of ischemic conditions including cardiac infarction, chronic coronary ischemia, stroke, cerebral ischemia and peripheral vascular disease.
- ✓ Inhibition of angiogenesis for treatment of disorders caused by uncontrolled angiogenesis such as proliferative retinopathies and cancer.

Patent Status:

US Patent pending

Inventors:

Jian Li, Jue-Lon Shie and Roger Laham

Publications (available upon request):

J Biol Chem. (2004) 279:24

Competitive Advantage:

As a regulator of the expression of three proteins involved in angiogenesis, RTEF has the potential to be more effective than any other single gene or protein therapy.