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INHIBITION OF ANGIOGENESIS AND LYMPHANGIOGENESIS USING TARGETED MORPHOLINOS

THERAPEUTICS

A morpholino (modified oligonucleotide sequence) that alters pre-mRNA processing, upregulating sKDR (suppressing lymphangiogenesis) and downregulating mbKDR (suppressing hemangiogenesis).

TECHNOLOGY TYPE

Antisense
Oncology
Ophthalmology
Gene Therapy

STAGE OF DEVELOPMENT

Proof of concept demonstrated in animal models for modulation of VEGFR isoform-specific expression.

IP PROTECTION

Nationalized PCT Issued in the United States

Morpholino-mediated increase in soluble Flt-1 expression results in decreased ocular and tumor neovascularization
US9506069B2
Morpholinos, morpholino upregulating, and associated methods
US9534222B2

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Reference Number: U-5071

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TECHNOLOGY SUMMARY

Vascular endothelial growth factor (VEGF) is a signal protein produced by cells that stimulates lymphangiogenesis and angiogenesis. When VEGF is overexpressed, it can contribute to various disease conditions, such as cancer and age-related macular degeneration.

The proposed technology modifies the polyadenylation mechanism, serving as a new drug for cancer and neovascularization disorders. It presents a new strategy for inhibition of angiogenesis and lymphangiogenesis through manipulation of VEGFR isoform expression. The VEGFR1 and VEGFR2 genes produce both membrane-bound and soluble isoforms, which have different effects on these processes. The membrane bound isoforms promote angiogenesis, while the soluble isoforms suppress lymphangiogenesis.

FEATURES AND BENEFITS

- Dual suppression of hemangiogenesis and lymphangiogenesis.
- Precise regulation of protein levels by knocking down one protein, while concurrently increasing the translation of another.
- Induction of a lesser inflammatory response and less off target binding (due to morpholino's neutral charge).

RECENT PUBLICATIONS

Luo, L., Uehara, H., Zhang, X., Das, S.K., Olsen, T., Holt, D., Ambati, B.K. (2013). Photoreceptor avascular privilege is shielded by soluble VEGF receptor-1. *eLife*, 2: e00324. doi: [10.7554/eLife.00324](https://doi.org/10.7554/eLife.00324)

INVENTOR PROFILE

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