

Ubiquitin Interacting Peptides as Cancer Therapeutics

Technology:

2011-002

Inventors:

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Invention Description:

Tumor angiogenesis is the proliferation of a network of blood vessels that penetrate into cancerous growths, supplying nutrients and oxygen to growing tumors. Among intracellular signaling pathways that are critical for establishing functional tumor angiogenesis, VEGF and Notch signaling pathways are prominent players. Inhibition of tumor angiogenesis is thereby one of the ways to block tumor growth.

Epsins are proteins that contribute to various needed membrane processes like endocytosis. Epsins have many domains to interact with various proteins related to endocytosis. Notably, the ubiquitin-interacting motifs (UIMs) of epsins play a crucial role in mediating the endocytosis of ubiquitinated plasma membrane proteins. OMRF Scientists have uncovered several important regulatory functions of cellular events, including the endocytic regulation of vascular endothelial growth factor (VEGF) and Notch signaling. Using Epsin knockout or conditional knockout mice, our scientists revealed the novel functions of epsins in modulating tumor angiogenesis in several cancerous mouse models via a mechanism of regulation of VEGF and Notch signaling simultaneously. The incidence of tumors in epsins knockout mice is much less than wild type mice validating this as an important therapeutic target for cancer.

Currently, OMRF Scientists are working on technology to develop a transduction peptide(s) which specifically targets the ubiquitin interacting motif (UIM) of Epsins and disrupts Epsin function as a means to treat tumors. The OMRF technology will be used to treat brain glioblastoma, prostate, colorectal, and other cancers.

Market Application:

The cancer therapeutic market is a multibillion dollar industry. Cancer is the second leading cause of death by disease, exceeded only by heart disease. Cancer costs billions of dollars. It also costs us the people we love. Reducing barriers to cancer care is critical in the fight to eliminate suffering and death due to cancer.

Features, Benefits, and Advantages:

- Current approach to regulate VEGF or NOTCH signaling pathway have been insufficient and produce side-effects.
- This new approach could be used to treat diverse types of solid tumors, including brain, prostate, colorectal and others.
- In animal models, the OMRF composition reduces the incidence of tumor metastasis.

Intellectual Property:

Provisional US Patent Filed

Stage of Development

Proof of concept studies completed. We are currently seeking industry partners to collaborate with us (in the form of research collaboration, licensing etc.) to develop and commercialize this technology.



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