Synstatin “SSTN<sub>I/V</sub>” Disrupts Cancer Growth

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a novel ‘fusion’ peptide shown to inhibit syndecan-1 activation of two receptors that play a key role in tumor growth, IGF-1R and VLA-4.

The peptide inhibits binding and activation of the receptors and can thus block survival and invasion of numerous cancer cells, tumor-induced angiogenesis and homing of leukocytes in immune diseases, solid tumors and lymphomas/leukemias/myeloma.

OVERVIEW

Leading UW–Madison oncologists previously showed that the matrix receptor syndecan-1 (Sdc1/CD138) – a matrix receptor highly expressed in multiple myeloma – captures and activates multiple cell surface receptors. Among these receptors are the insulin-like growth factor-1 receptor (IGF-1R) and very late antigen-4 (VLA-4, also known as the α4β1 integrin).

IGF-1R provides survival signaling for many tumor cells, including myeloma, as well as for activated endothelial cells. VLA-4 is expressed on leukocytes (lymphoid and myeloid) and their malignant counterparts, including myeloma, and has a major role in cell adhesion, extravasation from the blood stream and invasion. VLA-4 also provides resistance to chemotherapy, a mechanism known as Cell Adhesion-Mediated Drug Resistance or CAM-DR.

Thus, targeting one or both of these important receptors with a single drug holds great promise for disrupting cancer growth.

THE INVENTION

The researchers have now developed a fusion peptide with sequences derived from the extracellular domain of syndecan-1. The peptide, SSTN<sub>I/V</sub>, includes an IGF-1R-binding segment and a VLA-4-binding segment. It demonstrates significant bioactivity in vitro against cancer cells, immune cells and endothelial cells.
The researchers envision an immediate clinical application in myeloma, a cancer with no known curative therapies that appears highly susceptible to SSTN

APPLICATIONS

• Potential cancer/tumor therapeutic

KEY BENEFITS

• Targets growth, survival and invasion of tumor cells
• Targets tumor angiogenesis
• Does not affect normal tissue
• Stable in serum
• May be affective against tumor cells resistant to IGF-1R inhibitors
• No other drugs like it are available.

STAGE OF DEVELOPMENT

As the new peptide should retain all the activities of SSTN-IGF1R, and have additional inhibitory properties due to its VLA-4 blocking properties as well, the researchers anticipate that it will block tumor survival and angiogenesis in vivo like SSTN-IGF1R, but also block tumor invasion, leukocyte invasion and additional mechanisms in angiogenesis due to the VLA-4 blocking activity.

The researchers have shown conclusively in vitro that the new peptide blocks tumor cell migration, tumor growth and angiogenesis. It does so by targeting syndecan-1-coupled ternary receptor complexes on both activated endothelial cells and the tumor cells. Additionally, it remains stable during prolonged incubation in serum.

ADDITIONAL INFORMATION

Related Technologies
For information about other cancer-fighting synstatins developed by the researchers, see WARF reference numbers:
P06390US02
P120300US03
P120259US03

Publications

Tech Fields
Pharmaceuticals & Vitamin D - Oncology & hematology

CONTACT INFORMATION

For current licensing status, please contact Andy DeTienne at adetienne@warf.org or 608-960-9857.