Cases #412 #459 and #460

Threonyl-tRNA Synthetase (TARS) – A Novel Target and Biomarker for Metastatic Prostate and Ovarian Cancer

The aminoacyl-tRNA synthetases (AARS) family catalyzes the attachment of amino acids to tRNAs, but its members have now been found to play significant roles in a number of unique diseases, including autoimmune disorders and cancers. At UVM, researchers have identified a novel pro-angiogenic role for one member of the AARS family, TARS, that is also upregulated in metastatic prostate and ovarian cancers. The researchers have since shown that TARS itself is a pro-angiogentic chemokine-like protein and, in cell models, efficiently stimulates new blood vessel formation. This, together with TARS overexpression, suggest that the pro-angiogenic function of TARS may have a role in metastasis in prostate and ovarian cancer. Initial *in vitro* studies with anti-TARS borrielidin derived compounds further supports this mechanism and provide small molecule lead anti-cancer compounds for further optimization.

Applications:

- Diagnosis and monitoring of prostate and /or ovarian cancer.
- TARS inhibitors as anti-angiogenic cancer therapeutics.
- Increasing vascularization in cardiovascular and wound healing.

Advantages:

- Novel biomarker of metastesis.
- Novel anti-angiogeneic target and therapeutics for advanced cancers.
- Novel pro-angiogenic cytokine-like protein for increasing vascularization.

Intellectual Property and Development Status:

US Patents 10,087,435; 10,125,358; 10,175,237; US Non-Provisional Application US20190062722A1, UVM is looking for partners to help further validate the use of TARS in prostate /ovarian cancer diagnosis and progression, as well as lead compound optimization for both cancer treatment and vascularization.

References:

Threonyl-tRNA synthetase overexpression correlates with angiogenic markers and progression of human ovarian cancer Wellman et al. BMC Cancer 2014, 14:620

Regulation of Angiogenesis by Aminoacyl-tRNA Synthetases
Int. J. Mol. Sci. 2014, 15, 23725-23748

Secreted Threonyl-tRNA synthetase stimulates endothelial cell migration and angiogenesis
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