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-angiogenic chemokine-like protein and in cell models, efficiently stimulates new blood vessel formation. This together with its overexpression, suggest TARS’ pro-angiogenic function may have a role in metastasis in prostate and ovarian cancer. Initial in vitro studies with anti-TARS borrieliadin derived compounds further supports this mechanism.

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 metastasis.
- Novel anti-angiogenic target and therapeutic for advanced cancers.
- Novel pro-angiogenic cytokine-like protein.

Intellectual Property and Development Status:

UVM is looking for partners to help further validate the use of TARS in prostate/ovarian cancer diagnosis and progression, as well as help develop a novel class of borrieliadin derived anti-cancer therapeutics.

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
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Secreted Threonyl-tRNA synthetase stimulates endothelial cell migration and angiogenesis
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Inventors:  
Karen Lounsbury  
Christopher Francklyn  
Jason Botten  
Anne Mason

Contact Information:
Kerry Elizabeth Swift  
Technology Licensing Officer  
Kerry.Swift@med.uvm.edu  
802-656-8780