Development of novel CD109-based peptides as TGF-beta antagonists for the treatment of cancer

Overview

McGill University is seeking a company interested in developing a CD109-based peptide as TGF-β antagonists for treatment of squamous cell carcinoma (SCC) arising in the head and neck region. The invention relates to CD109, a glycosylphosphatidylinositol (GPI)-anchored protein, identified as a transforming growth factor (TGF)-β co-receptor that binds TGF-β and inhibits TGF-β signaling and fibrotic responses in vitro and in vivo. The potent effects of TGF-β in promoting metastasis in many cancers including head and neck squamous cell carcinomas are well documented. Our recent findings show that CD109 and CD109-based small MW peptides inhibit TGF-β-induced epithelial-mesenchymal transition, migration and invasion in SCC cells. Blocking excessive TGF-β signaling in SCC using CD109-based peptides represents a promising therapeutic strategy for the treatment of SCC.

Applications

Squamous cell carcinoma is a common malignancy arising in the squamous epithelium of various organs including skin, oral cavity, lips, esophagus, vagina, and others. SCC arising in the head and neck region (HNSCC) is the sixth most common cancer worldwide with an incidence of over 600,000 and more than 350,000 deaths per year. About two thirds of newly diagnosed patients present with advanced-stage disease, and despite aggressive multimodal therapy, a significant portion of the patients develop local recurrence or distant metastasis. Currently, there are no satisfactory treatment options for HNSCC patients with recurrent and/or metastatic disease, resulting in dismal survival rates.

Advantages

- Novel CD109-based amino acid peptide with a low propensity to aggregate
- Endogenous peptide so less chance of side effects
- High specificity and low toxicity
- Targeted therapy
- High unmet medical need
- Relevant to other cancers including breast, colorectal and prostate cancer, where a pro-metastatic effect of TGF-β is documented
Lead inventor: Anie Philip

Dr Anie Philip is Professor and Director of Plastic Surgery Research at McGill University. She is also the Director of Surgical Research Graduate Program at McGill University. Dr Philip has a long standing interest in the mechanism and regulation of TGF-β action in the skin and cartilage in the context of injury, repair and disease states. Her research has been focused on understanding the regulation of TGF-β signaling and responses in the skin and cartilage at the level of TGF-β activation, TGF-β receptor interactions, identification of novel TGF-β binding proteins and signal transduction mechanisms.