Cancer, Cardiovascular, Inflammatory Disease
Drug Discovery and Development
New Treatments for Global Unmet Clinical Need

Vascular Biology and Translational Research
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**Introduction**

Cardiovascular disease (CVD) and cancer remain the most prevalent causes of morbidity and mortality. These diseases, together, account for over half of all global deaths. The pathogenesis of these and related inflammatory, proliferative, migratory diseases is underpinned by molecular and cellular changes in our blood vessels. Our research is uncovering key networks of transcriptional control that lead to vascular disease. Building on these mechanistic insights, we are developing new drugs that have the potential to treat a myriad of health problems, from cancer and arthritis through to eye and heart disease.

**Available Projects**

1. **Novel cancer pharmacotherapeutics.** This project develops new small molecule inhibitors of immune checkpoints, notably the PD-1/PD-L1 system. Many different cancers use the PD-1/PD-L1 checkpoint to avoid being attacked by the immune system. This project involves work with cancer cells (focusing on melanoma), immune cells and animal models of cancer.

2. **Novel anti-inflammatory therapeutics for CVD.** Recent large scale clinical trials have established that CVD is a treatable inflammatory disease. This project develops potential new drugs for inflammatory CV conditions such as atherosclerosis, restenosis, unstable plaque causing a heart attack, and damage to heart after a heart attack, and involves work with vascular cells and animal models of CVD.

3. **Novel anti-inflammatory therapeutics for acute respiratory stress syndrome (ARDS).** ARDS is a type of respiratory failure typified by rapid onset widespread inflammation in the lungs. This project develops new treatments for ARDS and involves work with vascular cells and animal models.

4. **Novel therapeutics for diabetic retinopathy (DR).** DR is a complication of diabetes that affects blood vessels in the back of the eye (retina). Many patients with DR do not, or no longer respond to standard anti-VEGF therapy. This project develops new treatments for DR and involves work with vascular cells and animal models of DR.

Several recent examples are provided below.

**Example 1 – Control of Tumour Growth**

![Graph showing tumor growth](Image)

**Example 2 – Control of Metastatic Spread**

![Graph showing tumor growth](Image)

**Example 3 – Definition of Mechanisms in Cancer**

![Graph showing tumor growth](Image)

**Example 4 – Engineering a Potential New Gene Therapeutic for CVD**

![Graph showing tumor growth](Image)

**Example 5 – Control of Inflammation in Arthritis**

![Graph showing tumor growth](Image)

**Example 6 – Control of a Key Biomarker of Retinal Pathology**

![Graph showing tumor growth](Image)

**Recent References**

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