Stimulation of arterial collateral growth

**OCR Number:** OCR 5298  

**Description:**

Peripheral artery disease (PAD or peripheral vascular disease) affects 10%-25% in individuals over 55 years old with incidence increasing with age. It is a disease of arterial insufficiency where narrowed arteries (often caused by atherosclerosis) reduce blood flow to the limbs (ischemia). Moreover, atherosclerosis is the leading cause of morbidity and mortality in most developed countries. These are just some of the conditions that would benefit from arterial growth treatment. Dr. Simons and his colleagues at Yale have discovered a novel method of stimulating arterial collateral growth by simultaneous activation of both the Raf1/ERK and PI3K/Akt signaling pathway, a result not typically seen in adult cells, mimicking embryonic arteriogenesis. Specifically, ERK activation is achieved by introducing RAF1 mutant resistant to inhibition by PI3K/Akt signaling. Representative microCT images show increased artery development after treatment with GS4898 (an ERK activator), similar results are expected from ongoing mouse experiments with simultaneous activation of both Raf1/ERK and PI3K/Akt signaling.

**Value Proposition:** 12.5M people in the US suffer from ischemic conditions resulting in ~1M deaths each year and an annual health care expenditure of over $100B. Globally the peripheral arterial disease market was estimated at ~$900M in 2009. Since individuals with PAD have a 4-5 times higher risk of heart attack or stroke, the need for therapeutics is great. No pharmaceuticals currently exist on the market to stimulate arterial growth.

**Field of Application:** Treating any condition associated with defective arterial development or arterial insufficiency, such as peripheral or cerebral artery disease, advanced coronary, and ischemic cardiomyopathy.

**IP Status:** US provisional patent filed.  
**Publications:**

JCI 2010 Apr;120(4):1217-28. (PMID 20237411)

**Licensing Contact:** Christopher Unsworth  
christopher.unsworth@yale.edu