

# Plasmalogen modulation for atherosclerosis

Plasmalogen-enhancing compounds to significantly reduce the incidence of atherosclerotic plaque and risk of cardiovascular disease and for treating atherosclerosis.

## SUMMARY OF INVESTMENT OPPORTUNITY:

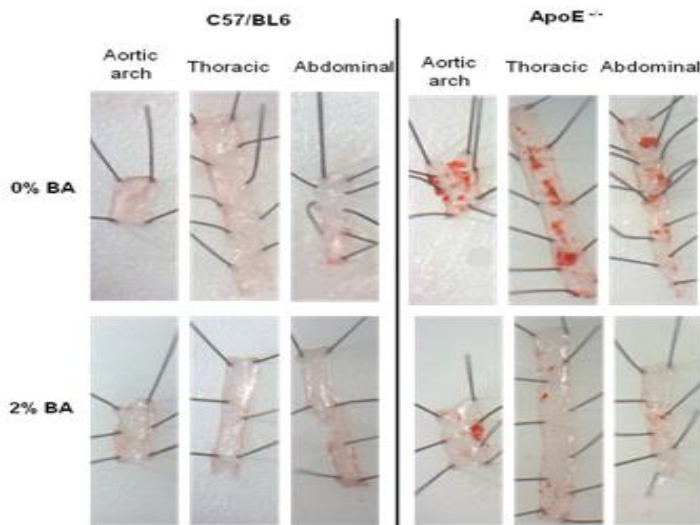
Atherosclerosis is the single most common cause of cardiovascular disease and is the major contributor to the development of angina, heart attacks, congestive heart failure, peripheral vascular disease and stroke. Despite the introduction of statin based therapy to reduce levels of plasma LDL-cholesterol, the epidemic of cardiovascular disease claims over 40,000 Australian lives and costs the health system approximately \$6 billion per year. New approaches are required if we are to further reduce the burden of cardiovascular disease.

Baker IDI researchers have identified negative associations of plasmalogens (a specific class of phospholipid) with stable and unstable coronary artery disease; they further identified plasmalogens as significant predictors of future cardiovascular events (heart attack, stroke and CVD death) independent of plasma cholesterol levels. In mice supplementation of plasmalogens reduced atherosclerosis by 70%.

Our extensive studies provide compelling evidence for a protective role of plasmalogens in cardiovascular disease, independent of cholesterol.

## TECHNOLOGY:

We have supplemented the diet of ApoE mice with batyl alcohol (a plasmalogen precursor); this resulted in a four-fold increase in plasma levels of plasmalogens and a significant attenuation of plaque formation (average 70%) across all regions of the aorta.



## PROBLEM / TARGET MARKET:

We are developing a new oral nutritional supplement, which we call a plasmalogen precursor, to reduce metabolic and cardiovascular risk. More than 50% of US adults make regular use of dietary supplements; use increases with age and women use supplements more than men. The most common supplement taken is a multivitamin, and approximately 50% of users have been taking supplements for more than five years. Whilst growth in the prevalence of supplement use plateaued around 2000, the use of supplements, and the number of supplements used, increases in people with chronic disease by a factor of about 1.5. The global retail market for fish oils and omega-3 polyunsaturated fatty acid (PUFA) supplements was around US\$3.6 billion (from a total supplement market of US\$89B) in 2014 and whilst growth from 2013 was small (1.6%), growth in the Asia Pacific is estimated to be 16.7% by 2019.

The drivers of retail demand for omega-3 fatty acids are the perceived benefits on health, preventative health and the increase in use as people get older. The sector is sensitive to the impact of publicity: the mechanism of action of PUFA's is not clear and the real benefit of this form of supplement remains controversial. This drives retail innovation in the sector with new positioning and delivery formulations as dominant strategies. This provides an opportunity for a product like the plasmalogen precursor with a compelling clinically-proven benefit, either as a combination product with PUFA's or as a discrete entity. Moreover, market entry and penetration will be enabled by a supporting narrative linked conceptually with PUFAs (essential fatty acid, constituent of seafood, preventative health) but acting by a discrete mechanism, and because of "green manufacture", free of issues related to sustainability and contamination with heavy metals or dioxins.

## STAGE OF DEVELOPMENT:

- Identifying the optimal class of alkylglycerol for plasmalogen modulation (PK/PD studies)
- Next steps: formulation, manufacture, clinical trial

## INTELLECTUAL PROPERTY:

PCT/AU2015/050552 "Glycerolipids and uses therefore" with priority date of 16 Sep 2014. The first claim of the patent is "*A method of reducing the incidence of atherosclerotic plaque in a subject, the method comprising, consisting or consisting essentially of: increasing the level of plasmalogen in the subject to thereby reduce the incidence of atherosclerotic plaque in the subject.*"

## COMPETITIVE ADVANTAGE:

- Based on natural compounds such that progression into clinical trials will be rapid and safe
- Could position as a unique treatment for patients with atherosclerosis and established CAD.
- Unique ability to stabilize or reverse the effects of atherosclerosis.
- Unique drug target and mechanism of action (different from statins).

## TEAM:

**Associate Professor Peter Meikle** is a NHMRC Senior Research Fellow. At Baker IDI he leads the Metabolism Program and is Head of the Metabolomics Laboratory. A/Prof Meikle developed one of the most advanced lipidomic platform that has made a substantial contribution to many collaborative projects both in Australia and internationally. He is also first named inventor on five patents (two in the past five years).

**Prof Spencer Williams** (PhD Organic Chemistry, UWA 2001) leads a vibrant research group in the School of Chemistry, Bio21 Molecular Science and Biotechnology Institute, University of Melbourne, with a focus on Chemical Biology and Medicinal Chemistry. He has been involved in the founding of three Melbourne-based biotechnology companies (NeuProtect/Armaron, Fibrotech, OccuRx).

## CONTACT DETAILS:

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