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Enzyme Engineering

Short Communication

Anti-atherogenic effects of (+)-catechin: A promising nutraceutical candidate

Yee-Hung Chan

Cardiff University, UK

ABSTRACT

(+)-Catechin, a naturally-occurring flavanol, has demonstrated multiple anti-atherogenic and anti-inflammatory properties in our previous studies using human monocytes/macrophages and in a short-term pilot study using wild-type mice fed High-Fat Diet (HFD). However, key questions yet to be answered are; does this anti-atherogenic activity expand to other key cell types implicated in data show that (+)-catechin significantly attenuates reactive oxygen species production in HUVECs and HASMCs, inhibits HASMC migration and has beneficial effects on HUVEC mitochondrial bioenergetic profile. Additionally, (+)-catechin feeding reduces fat pad weights, plasma triglyceride levels and aortic sinus plaque size. Pending further outcomes and later, regression studies, (to see if (+)-catechin can stimulate regression of existing plaques), the disease and can (+)-catechin attenuate disease progression and stimulate its regression in vivo in a model system of atherosclerosis? Firstly, to determine whether (+)-catechin can attenuate endothelial dysfunction, key associated parameters are being studied using Human Umbilical Vein Endothelial Cells (HUVECs) in a range of assays. To investigate the effect of (+)-catechin on vascular smooth muscle cell migration, Human Aortic Smooth Muscle Cells (HASMCs) were used to recapitulate migration in vitro, via a modified Boyden chamber method. Secondly, to determine whether (+)-catechin can attenuate atherogenesis and promote plaque stabilisation, low-density lipoprotein receptor knock-out (LDLr-/-) mice were fed HFD supplemented with (+)-catechin for 12 weeks; various tissues/organs were harvested to analyse the resulting plaque and disease risk factors.

These data will form a solid basis for progression onto human studies in future, opening up alternative avenues for the prevention/treatment of atherosclerosis

Biography:

Yee-Hung Chan is in the second year of her British Heart Foundation-funded PhD at Cardiff University. Prior to this, she completed her Master of Research in Biosciences and Bachelor of Science in Biomedical Science degrees also at Cardiff University, where she undertook research projects with Prof. Dipak Ramji which involved investigating various nutraceuticals for atherosclerosis.