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Omega-6 poly unsaturated fatty acid; Di-hommo-γ-linolenic acid (DGLA), reduces atherosclerosis in an *in vivo* murine model

Omega-6 poly unsaturated fatty acids have caused great controversy in terms of cardiovascular health. However, some have been shown as anti-inflammatory, but their role in atherosclerosis is poorly understood. In this study, we have investigated the impact of DGLA, found in vegetable oils, nuts and seeds on atherosclerosis progression *in vivo*. Our previous *in vitro* studies have shown that DGLA attenuates several pro-atherogenic cellular processes. Studies have moved *in vivo*, where the impact of DGLA supplementation was determined on cholesterol, triglyceride and organ/body weight in LDLR mice fed a High Fat Diet (HFD). The presence of atherosclerotic plaque was determined in these animals, along with plaque size, lipid content and inflammatory make-up. Whether DGLA supplementation impacted on key atherosclerosis gene expression in the liver was also investigated. 8-week-old, male LDLR mice were fed a HFD DGLA (500mg/kg) for 12 weeks. Plasma samples were analyzed for lipid and lipoprotein levels. Aortic root sections were histologically analyzed to determine plaque presence, size and lipid content. Immunofluorescence was used to further identify plaque inflammatory status. Atherosclerosis PCR arrays were used to determine gene expression from liver samples. Despite no changes in plasma cholesterol levels, DGLA supplementation decreased plaque occlusion and lipid content. Macrophages, smooth muscle cells and T-cells were also decreased in these plaques. In animals fed HFD DGLA, the expression of 5 genes were significantly increased and expression of 20 genes were significantly decreased. These data demonstrate the anti-inflammatory actions of DGLA that can be exploited for the treatment/prevention of atherosclerosis.

Biography

Jessica Williams has completed her PhD at the age of 25 years from Cardiff University School of Medicine, along with postdoctoral studies from Cardiff University School of Biosciences. Contributions to a number of publications in reputable journals.

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