Catriona Kielty et al., J Clinic Toxicol, 2018, Volume 8
DOI: 10.4172/2161-0495-C1-027



## The toxicological impact of unconjugated linoleic acid

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Historical dietary recommendations have resulted in the substitution of saturated fatty acids with polyunsaturated fatty acids (PUFAs), with a subsequent increase in the intake of dietary linoleic acid. Some PUFAs, particularly, linoleic acid, have been associated in the past with a pro-inflammatory response. Linoleic acid, being a precursor for arachidonic acid, is associated with the production of pro-inflammatory eicosanoids such as prostaglandins, thromboxanes and leukotrienes, as well as independently affecting inflammation through its metabolism to biologically active oxidation products. The primary aim of this investigation is to delineate the mechanism of action of linoleic acid in its free fatty acid form, specifically *cis*-9, *cis*-12, unconjugated linoleic acid (ULA), in relation to cytotoxicity and inflammation. Experiments were performed using the epithelial cell line, HepG2, and the endothelial cell line, HUVEC (Human umbilical vein endothelial cells). Using the MTT assay as an endpoint, the potential cellular lipotoxicity of this essential fatty acid was investigated when cells were exposed to it at high concentrations (0 to 2.5 mM). The Oil Red O assay was also used to identify the intracellular accumulation of neutral lipids in treated cells. To date, results indicate that high concentrations of ULA inhibit cell proliferation (P=0.0001) which could indicate an inflammatory response. Intracellular lipid accumulation also declined as ULA concentrations increased. Future work will include the identification of inflammatory biomarkers, such as TNF-α, associated with inflammation, in order to further elucidate the mechanism of action of ULA.

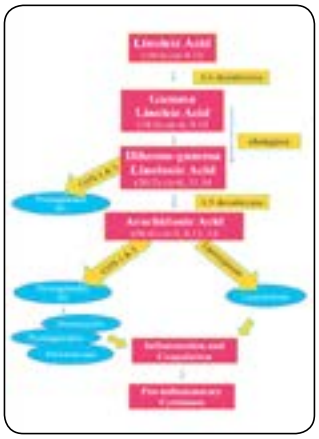

**Figure 1.** Metabolic pathway of linoleic acid resulting in the production of pro-inflammatory eicosanoids.

### Biography

Catriona Kielty (BSc) is a Veterinary Nursing and Applied Bioscience Postgraduate student working in the field of lipid research with a particular focus on dietary linoleic acid and its impact on inflammation and coagulation. Her research interest include: Lipidomics and Cellular Toxicology.

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