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The anti-inflammatory activity of sinapinic acid containing phenolic extracts from Irish rapeseed meal

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Rapeseed meal is a low-economic value by-product of rapeseed oil production, which is commonly used as animal feed. However, rapeseed (*Brassica napus* L.) contains more phenolic compounds than any other oilseed plant. Sinapinic Acid (SA) has been identified as a major insoluble phenolic in rapeseed hulls and constitutes 70-90% of soluble esterified phenolic acids in rapeseed meal. Phenolic acids, including SA, have known bioactive properties, including anti-inflammatory activity. As part of this project, two phenolic extracts containing SA were generated from Irish rapeseed meal supplied by Donegal Rapeseed Oil Company, Donegal. The anti-inflammatory activity of the extracts and commercial SA were determined. Quantitative Polymerase Chain Reaction (QPCR) and Enzyme-Linked Immunosorbent Assays (ELISA) were performed using THP-1 cells, human primary monocytes and human derived peripheral blood mononuclear cells (PBMCs). The anti-inflammatory activities of SA containing extracts I and II were determined using two key inflammatory mediators: TNF-alpha and CXCL8. Extract I significantly increased CXCL8 expression but did not affect TNF-alpha expression. Extract II significantly reduced TNF-alpha expression when assayed at concentrations of 1 and 0.5 mg/mL. Extract II at 1 mg/mL also significantly reduced CXCL8 expression, while significantly increasing CXCL8 gene expression. The anti-inflammatory activity of extract II was also assessed using human monocytes over a period of 3 hours, with 1 mg/mL found to significantly reduce CXCL8, and also reduce TNF-alpha expression. This is also the first study to demonstrate the anti-inflammatory activity of SA in human PBMCs. Extracts containing SA from Irish rapeseed meal could be potentially valuable as an anti-inflammatory agent.

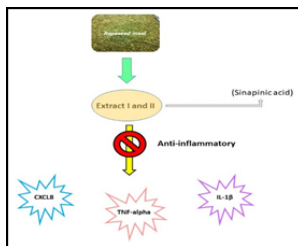


Figure 1. Extracts containing sinapinic acid, generated from Irish Rapeseed meal, inhibit pro-inflammatory cytokines including TNF- α , CXCL8 and IL-1 β

Biography

Leah Quinn completed his undergraduate degree at Dublin City University (DCU) in B.Sc. (Hons) 'Genetics and Cell Biology' in 2013. She obtained his master's degree from Trinity College Dublin in 'Translational Oncology' in 2015. In the final year of his PhD, She completed a Teagasc Walsh Fellowship in Trinity College Dublin. She has 3 publications to date in the journals: Lung Cancer; Journal of Agriculture and Food Chemistry and The Irish Journal of Agricultural and Food Chemistry.

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