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The anti-inflammatory properties of lipids extracted from Omani camel milk

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Introduction: Very little evidence exists to date on the potential health benefits of camel milk derived lipids. Macrophage activation status reflects a beneficial or detrimental role in various diseases, in particular; switching macrophages to an anti-inflammatory M2 phenotype could be important in preventing the development of inflammatory diseases such as atherosclerosis and type-2 diabetes.

Objectives: This study aimed to determine the lipid content and characteristics of fatty acids derived from Omani camel milk and investigate their ability to regulate macrophage inflammatory responses using the human macrophage cells dTHP-1.

Method: Camel milk lipids were converted their fatty acid methyl esters and analyzed by Gas Chromatography-Mass Spectrometry. dTHP-1 cells were pre-treated with the extracted lipids, stimulated with glycated-serum albumin and inflammatory mediators associated with M1 and M2 macrophages determined by ELISA, Real-Time PCR and Flow Cytometry.

Results: Fatty acids in Omani Camel milk included saturated fatty acids (SFAME) myristic acid ME (C14:0), palmitic acid ME (C16:0), stearic acid ME (C18:0), and un-saturated (UNSFAME) palmitoleic acid ME (C16:1), 9-octadecenoic acid ME (E- C18:1 n-9), which were recovered from methylation of total camel lipids. These lipids were able to significantly reduce secretion of two inflammatory cytokines, TNF- α and IL-1 β without any reduction in cell-viability. The lipids enhanced the anti-inflammatory cytokine IL-10 and up-regulated expression of the M2 marker CD163.

Conclusion: This study suggests that the lipid component of Omani camel milk significantly reduces macrophage inflammation, an action associated with the switching of macrophages to an anti-inflammatory M2 phenotype.

Biography

Al-Nasseri Raya Hamdan Salim has completed her degree in Biotechnology (1997) from University of Abertay, Dundee, United Kingdom and her MSc in Biomedical Sciences (distinction) from University of Wales Institute Cardiff (UWIC), Wales, UK (2004). Currently she is undertaking PhD at Cardiff Metropolitan University, UK and her aim is to investigate on Omani camel milk lipids and its anti-inflammatory properties, her study is funded by the Royal Court Affairs, Sultanate of Oman. In Oman, she works as a Biotechnologist in the Center of Research and Diagnostic Laboratory, Royal Court Affairs, Directorate of Veterinary Services, Muscat, Sultanate of Oman.

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