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Investigation of the molecular mechanisms underlying the antiatherogenic actions of kaempferol in human THP-1 macrophages

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The major cause of mortality worldwide is cardiovascular disease (CVD) (WHO, 2015). Atherosclerosis, hardening and narrowing of arteries, caused by accumulation of fatty acids and lipids (cholesterol plaques) is a main reason of stroke, myocardial infarction and angina. Present therapies basically use statins like β-Hydroxy β-methylglutaryl-CoA for cardiovascular disease showed less than 70% efficacy and multiple side effects. To evaluate the impact of kaempferol, a natural medication, against an atherosclerotic cell model, we undertook an *in vitro* investigation. The researchers used cytotoxicity assays, Boyden chamber invasion assays and quantitative real-time PCR. Affymetrix microarrays were used to profile the entire transcriptome of kaempferol-treated cell lines and Partek Genome Suite was used to interpret the results. THP-1 macrophages were not cytotoxic to kaempferol. In comparison to the control, kaempferol reduced monocyte migration mediated by monocyte chemotactic protein 1 (MCP-1) by 80%. MCP-1 (73.71-fold) and intercellular adhesion molecule 1 (ICAM-1, 2.47-fold) expression were both reduced in kaempferol-treated cells, according to qPCR results. For IFN-γ and IFN-γ + kaempferol-treated cells, we found 295 and 168 differentially expressed genes (DEGs), respectively. According to DEG pathway analysis, kaempferol exhibits anti-atherosclerosis and anti-inflammatory characteristics. Kaempferol is an effective and safe therapy for atherosclerosis.

References

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Biography

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