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## Conjugated linolenic acid as a functional food: Studies on its anti-tumor and anti-allergic activities

Conjugated Linolenic Acids (CLN) are a group of positional and geometrical isomers of linolenic acid (C18:3) having three conjugated double bonds, which are relatively abundant in some plant seed oils. Recent researches have demonstrated the diverse health-promoting properties of CLN, including anti-obese, anti-oxidative, anti-inflammatory and anti-tumor activities. In this study, jacaric acid (8Z, 10E, 12Z-octadecatrienoic acid), a CLN isomer that is present in jacaranda seed oil, was found to inhibit the *in vitro* and *in vivo* growth of the human promyelocytic leukemia HL-60 cells, with little or no cytotoxicity towards normal cells. Mechanistic studies indicated that jacaric acid could trigger apoptosis in the HL-60 cells by inducing mitochondrial membrane depolarization, modulating the expression of apoptosis-regulatory proteins, inducing the release of mitochondrial cytochrome C and by differential activation of caspase-3 and -9 but not caspase-8 activities in HL-60 cells. Interestingly, jacaric acid could alleviate the allergic response in a human mast cell line HMC-1 by suppressing the release of  $\beta$ -N-acetyl-glucosaminidase, tryptase and cytokines such as interleukin-4 and -13 in sensitized HMC-1 cells. Moreover, the expression of MMP-2 and MMP-9 proteins was down-regulated in jacaric acid-treated HMC-1 cells whereas the expression of TIMP1 protein was increased. Taken together, our results indicate that jacaric acid can exhibit significant anti-tumor and anti-allergic activities on human cells and therefore might be a potential functional food for the management or as an adjunct therapy for some forms of myeloid leukemia and allergic disorders.

### Biography

K N Leung has received his BSc degree in Biochemistry from The Chinese University of Hong Kong (CUHK) and has obtained the PhD degree in Microbiology and Immunology from The Australian National University. After two years of Postdoctoral work at the Pathology Department of the University of Cambridge, he returned to the CUHK as a Lecturer in the Department of Biochemistry in 1983. He was the former Dean of General Education in Chung Chi College, the Associate Dean of Science (Education) of CUHK and the Chairman of the Hong Kong Society for Immunology. He is currently an Adjunct Professor in the School of Life Sciences, CUHK and the School of Science and Engineering, CUHK (Shenzhen). His main research interests include immune-pharmacological studies of natural products and Chinese medicinal herbs, cancer immunotherapy, nutrition, immunity and cancer.

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