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Anti-cancer effects of α-mangostin against oral cancer

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Mangosteen, scientific name Garcinia mangostana, is a tree found in South East Asia, and pericarps of the fruit have been used in folk medicine for the treatment of many human illnesses such as skin and wound infections, and inflammatory diseases. Mangosteen fruit rinds contain high concentration of xanthones. -Mangostin and -mangostin are the main xanthones isolated from G. mangostana. Xanthone extracts from G. mangostana have been reported with chemoprevention effects against the chemically induced colon cancer via the reduction of c-myc expression, suppression of tumor growth and metastasis in a mouse model of mammary cancer and a recent report showed the inhibition of prostate cancer growth by -mangostin, the main constituent of the G. mangostana xanthones. However, it is unclear whether -mangostin induces cell death to oral cancer. Then this study examined the impact of -mangostin against oral squamous cell carcinoma. At first, we analyzed the expression of c-myc in 5 human oral suquamous cell carcinoma (HOSCC) cells. The expression level of c-myc mRNA was maximum in SAS cells, while on the other hand, it was minimum in HSC-4 cells. Hence, SAS cells were treated with -mangostin. The -mangostin slightly induced cell death to SAS cells, but not strongly. Synergistic effects by the combined treatment of -mangostin and anti-cancer drugs were reported. Then we attempted to evaluate the synergistic effect on cell growth when cytokine, TNF related apoptosis inducing Ligand (TRAIL), was used with -mangostin (total 10 ng/ml and 30 μM). As the result, cell death was clearly induced to SAS cells. It was demonstrated that the combined treatment of -mangostin and TRAIL in SAS cells led to apoptosis via the activation of caspases-9, -3/7. Furthermore, this apoptosis was induced by G1 cell cycle arrest in SAS cells. These data suggested that the combination therapy by -mangostin and TRAIL might be of great use with a tremendous amount of potential as an anti-oral cancer drug.

Biography

Masakatsu Fukuda had completed his PhD from Nihon University and Postdoctoral studies from International Agency for Research on Cancer (IARC, Lyon, France). He is a Junior Associate Professor of Division of Oral and Maxillofacial Surgery, Department of Diagnostic and Therapeutic Sciences, Meikai University School of Dentistry. He has published more than 40 papers in reputed journals.

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