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ANTI-CANCER ACTIVITY OF DAMNACANTHAL FROM NONI

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Damnacanthal is an anthraquinone isolated from the root of *Morinda citrifolia* L. (noni), and it exhibits many pharmacological properties, including anti-cancer activity. Damnacanthal targets several signal transduction proteins related to cell growth inhibition or apoptosis. However, the molecular mechanisms by which damnacanthal affects anti-cancer activity have not been elucidated in detail. Cyclin D1 is an important regulatory protein in cell cycle progression and is overexpressed in many cancer cells and CRM1 is a target protein for cancer therapy. In this study, we investigated the molecular mechanism of damnacanthal on cyclin D1 and CRM1 expression. We found that damnacanthal inhibited growth of several cancer cell lines (HCT-116, HT-29, MCF-7 and PC-3) in a dose- and time-dependent manner with decreasing in cyclin D1 protein expression. Damnacanthal did not change mRNA of cyclin D1; rather it suppressed cyclin D1 expression at the posttranslational level. Subsequent experiments with several mutant cyclin D1 constructs suggest that the lysine sites of cyclin D1 play a pivotal role in damnacanthal - mediated cyclin D1 degradation. Furthermore, damnacanthal was encapsulated in self-assembled chitosan nanoparticles to improve both physicochemical and biological activities. Our results suggest that encapsulated damnacanthal suppresses CRM1 expression and exhibits better activity in cell growth inhibition, compared to non-encapsulated damnacanthal. Thus, damnacanthal has potential to be a candidate for the development of chemoprevention or therapeutic agents for cancers.

Biography

Seung Joon Baek has completed his PhD in Human Genetics from University of Maryland School of Medicine and Postdoctoral studies from National Institutes of Health, USA. He used to work as Professor of Veterinary Medicine at University of Tennessee USA and now is working in Seoul National University as a Professor. He has published more than 130 papers in reputed journals and has been serving as a Director of Lab of Signal Transduction.

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