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Plant derived diarylheptanoids as Wnt/ β -catenin pathway inhibitors

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The Wnt/ β -catenin signaling pathway plays a primary role in the differentiation, proliferation, and function of many cells but disruption of the pathway is involved in cancer development including colon cancer. Colorectal cancer is the third most common cancer in males and the second most common cancer in females, accounting for approximately 10% of all cancer-related deaths. Inhibiting the Wnt/ β -catenin pathway can be a good strategy for chemoprevention and treatment of colorectal cancer. While screening for Wnt/ β -catenin pathway inhibitors from medicinal plants, we found that (E)-7-(4-hydroxy-3-methoxyphenyl)-1-phenylhept-4-en-3-one (compound 1), among six diarylheptanoids from lesser galangal (*Alpinia officinarum*), most potently suppressed Wnt3a-induced β -catenin/Tcell factor activity. Moreover, compound 1 suppressed proliferation of colon cancer cells by inhibiting β -catenin translocation to the nucleus by disrupting the β -catenin/galectin-3 complex. Furthermore, a structure-activity relationship study implicated that the enone group in the linker is critical and the hydroxy substituent on the aromatic ring is generally preferred for activity. Our findings suggest that diarylheptanoids from lesser galangal exerts anticolon cancer activity by down regulating the Wnt/ β -catenin pathway. Bioactive diarylheptanoids and the basic understanding of their structure-activity relationship could be utilized to develop potential candidates for β -catenin-targeted cancer treatment.

Biography

Jae-Ha Ryu has completed his PhD at the College of Pharmacy, Seoul National University, Korea in 1989 and Post-doctoral studies from National Institute of Health, Maryland, USA. He got academic position in 1992 at College of Pharmacy, Sookmyung Women's University, Seoul Korea. He is the Director of Research Center for Cell Fate Control (Medical Research Center). His main research interest is to suggest leading compounds from medicinal plants for drug development, especially for the treatment of cancer and various metabolic diseases. He has published 150 papers in reputed journals.

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