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Baicalein inhibits tumor cell-induced platelet aggregation and suppresses pulmonary tumor metastasis

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Recently, the importance of platelet activation in cancer metastasis is generally accepted and development of new platelet inhibitor with minimal adverse effect is a promising area of targeted cancer therapy. Baicalein is one of the functional ingredient derived from the root of Huangqin. Its pharmacological effects including anti-oxidative and anti-inflammative effects have already been shown. However, effect on platelet activation of this molecule is scarce. Therefore, we investigate the effects and its molecular mechanisms of baicalein on various agonists, including tumor cell, stimulated platelet activation and pulmonary cancer metastasis. Effects of baicalein on agonist-stimulated platelet activation, granule secretion and adhesion molecule expression, cyclic-nucleotide release, VASP and MAPK phosphorylation were evaluated. Indeed, influences of baicalein on platelet aggregation induced by tumor cells and adhesion of cancer cell-platelets were evaluated. Finally, after acute toxicity test, we also examined the anti-metastatic activities of baicalein using relevant *in vivo* metastasis models. Baicalein inhibited various agonists such as collagen, ADP, and thrombin-induced platelet activation in a concentration dependent manner. Agonist-induced granule secretion (P-selectin expression, ATP release), mobilization of intracellular $[Ca^{2+}]i$ and glycoprotein IIa/IIIb expression were also reduced in baicalein-treated platelets. Baicalein also attenuated ERK2, p38 and Akt activation and enhanced VASP phosphorylation that was reversed by H-89 (PKA inhibitor). Moreover, baicalein attenuated C6 rat glioma tumor cells-induced platelet aggregation *in vitro* and CT26 colon cancer metastasis *in vivo*. Baicalein shows broad anti-platelet properties. This feature might have therapeutic implications for the prevention of cancer metastasis.

Biography

Man Hee Rhee has completed his graduation in Veterinary Medicine in 1989, completed his PhD degree in 2000 in Neurobiology Department, Weizmann Institute of Science, Israel. He is the Chairman of the Department of Veterinary Medicine, Kyungpook National University. He has published more than 250 papers in reputed journals and has been serving as an Editorial Board Member of internationally renowned journal.

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