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Potential anticancer activity of Psammaplin A analogs derived from marine sponges in human lung cancer cells

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Marine natural products have been promising sources for developing drugs to treat various human diseases. In our continuous efforts to search for anticancer agents from natural sources, Psammaplin A (PsA), isolated from marine sponges of the order Verongida, was found to be a potential candidate for cancer therapeutic agents. PsA, a unique symmetrical bromotyrosine, has exhibited a variety of bioactivities and it showed an inhibition of DNA methyltransferase and histone deacetylase with growth-inhibitory activity of cancer cells. However, its underlying mechanism of action and the structure-activity relationship (SAR) with PsA analogs have not been fully elucidated. In the present study, 28 synthetic PsA derivatives were synthesized and examined for the cytotoxicities against cancer cells. A SAR study revealed that the presence of free oxime and disulfide functional groups was responsible for high cytotoxicity. Furthermore, the bromotyrosine component in PsA was relatively tolerable and hydrophobic aromatic groups preserved the cytotoxicity. Especially, a β-naphthyl derivative of PsA showed a potential cytotoxicity and was comparable to that of PsA. The compound also exhibited a potential antitumor activity in a nude mouse xenograft model. These findings indicated that free oxime and disulfide linker in the chemical structure play an important role for cytotoxicity and PsA analogs might be considered to be potential antitumor agents.

Biography

Sunghwa Kim has obtained her Bachelor's degree from College of Pharmacy, Seoul National University, South Korea in 2017. She is currently a Master's degree student at the College of Pharmacy, SNU. Her research interests are natural product science, cancer cell, cell biology and elucidation of mechanisms of actions with bioactive compounds.

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