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Overcoming multidrug drug resistance in P-glycoprotein/MDR1 over-expressing cell lines by marine derived compound, CSS

Dong-Hwan Lee

Pusan National University Hospital, Republic of Korea

This study was performed to investigate the effect of CSS on the p-glycoprotein (p-gp)/MDR1 over-expression which is likely to bring about multi-drug resistance. The CSS is a marine derivative extracted from a oceanophyte under the East Sea of Korea. It was chosen from among 178 marine derivatives after preliminary cytotoxicity tests using human glioblastoma cell line to exclude compounds with severe reactivity and effectiveness screening tests with colon cancer cell line (LS174T). The viability of LST174T and breast cancer cells (MCF-7) treated with CSS was measured using CellTiter-Glo Luminescent Cell Viability Assay (G7571, promega) for 120 hours with or without paclitaxel 10 μ M. The concentrations of CSS were 0, 0.001, 0.01, 0.03, 0.1, 0.3, 1, 3, 10, 30 μ M. To investigate the mechanism, the expression level of p-gp/MDR1 and PXR were assessed by western blot and RT-PCR with rifampin which induces MDR1 over-expression. The CSS 30 μ M inhibited the cancer cell proliferation without killing the cells while cancer cells increased without CSS in the 96-well plates. The numbers of LS174T treated with paclitaxel 10 μ M decreased by 40% without CSS versus with CSS 10 μ M. In case of MCF-7, the rates were 0% without CSS versus 50% with CSS 10 μ M. The CSS inhibited the overexpression MDR1 and PXR in the presence of rifampin. The CSS seems to be a potent chemo-sensitizer overcoming multi drug resistance.

Biography

Dong-Hwan Lee has completed his PhD from Yonsei University College of Medicine. He is an Assistant Professor of Clinical Pharmacology in the Department of Clinical Pharmacology and the Manager of the Clinical Pharmacology division of the clinical trial center in Pusan National University Hospital. He has published 13 papers in reputed journals.

dhlee97@gmail.com

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