

# Predictive, Preventive and personalized Medicine & Molecular Diagnostics

October 05-06, 2017 Chicago, USA

## Therapeutic implication of the phytochemicals in human gastric cancer cells

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The cysteine-rich angiogenic inducer 61 (CYR61), an extracellular matrix-associated protein, is involved in survival, tumorigenesis, and drug resistance. There is an increasing demand for developing agents that target CYR61. Hence, we study the effects of flavones against CYR61-overexpressing human gastric adenocarcinoma AGS (AGS-CYR61) cells. Quercetin down-regulates CYR61 and concomitantly decreases in the levels of MRP1 (Multidrug Resistance-Associated Protein-1) and nuclear factor NF-kappa B ( $\kappa$ B) p65 sub-unit, reverses multidrug resistance, and inhibits colony formation in AGS-CYR61 cells. AGS-CYR61 cells treated with quercetin at sub  $IC_{50}$  over a range of 5-FU or ADR concentrations manifested strong synergistic effects with these two drugs. Our results demonstrate that CYR61 is a potential regulator of ABC transporters and quercetin can be the novel agent that improves the efficacy of anticancer drugs by down-regulating CYR61 and ABC transporters. Histone deacetylase 6 (HDAC6) is a unique cytoplasmic enzyme which contributes to malignant progression in various cancer. We found that compound D inhibits HDAC6 activity, increases acetylated  $\alpha$ -tubulin, reduces the level of  $\beta$ -catenin, and suppresses cell proliferation. Increase of  $\alpha$ -tubulin acetylation by compound D resulted in tubulin polymerization, and consequently, induced aberrant mitosis. Moreover, treatment with high concentrations of compound D induces cell death by mitotic catastrophe, whereas low concentration of compound D induces senescence with upregulation of p21 and Rb, and increase in the phosphorylation of mTOR and the  $\beta$ -galactosidase activity. Therefore, compound D can also be considered as a promising new candidate for anti-cancer drug development.

### Biography

Somi Kim Cho is currently working in the Department of Biotechnology, Jeju National University, Korea. She has published numerous research papers and articles in reputed journals and has various other achievements in the related studies. She has extended her valuable service towards the scientific community with her extensive research work.

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