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6-Shogaol, 6-gingerol and curcumin's effects on GSK3β/β-catenin pathway in lung cancer cell line

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Lung cancer is the *deadliest* type of cancer for both men and women. Non small cell lung cancer (NSCLC) is the most common type of it. β-catenin overexpression disrupts the cell differentiation and make the cells proliferate so fast. It is believed that mPGES-1/cyclooxygenase- 2 contributes to this. So as a new aspect, it is supposed that anti-cancer effect might be seen after decreasing the β-catenin levels in the cell. We investigated the anticancer effects of 6-gingerol and 6-shogaol from *Zingiber officinale*. Also we aimed to see the anticancer effect is dependent on whether mPGES-1 (microsomal prostaglandine E_2 synthase 1), β-catenin and GSK3β (glycogen synthase kinase 3 β) pathway or not. NSCLCcell line named A549wasused in our study. Cells were incubated with IL-1β (interleukin 1 β) for 24 hours in order to get their mPGES-1 enzyme induced. Experiments are performed both on IL-1β treated and non treated groups. Curcumin from *Curcuma longa,* a natural compound that is known for its mPGES-1 inhibitory and anticancer effect, is used as a positive control. Cytotoxicity of molecules were determined using MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. Data obtained from MTT was used to perform western blottingassay. After 24 hrs of incubation with molecules, mPGES-1, GSK3β, p-GSK3β and β-catenin protein levels were measured. As a result of 24 hrs MTT assay, 6-shogaol's IC_{50} was 62μM. In western blot analysis mPGES-1, p-GSK3β, β-catenin were higher and GSK3β was lower in IL-1β treated group, while the effects of curcumin and 6-shogaol on these parameters were completely against it. As a result of the assays, we saw that 6-shogaol showed as much anticancer effect as curcumin and it is thought that 6-shogaol might be a potential candidate in NSCLC treatment because it is cytotoxic and decreases the protein levels of mPGES-1 and β-catenin.

Biography

Eren Demirpolat works as a Research Assistant in Deparment of Pharmacology and has a two years experience in good clinical practice. He participated in nearly 150 bioequivalance trials as a clinical research pharmacist in Turkey. His PhD thesis is focused on potential mPGES-1 inhibitors and can perform cell culture, western blotting and PCR methods.

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