

Silver nanoparticles *Clinacanthus nutans* leaves extract induced apoptosis towards oral squamous cell carcinoma cell lines

ABSTRACT

Purpose: The purpose of this study was to investigate apoptotic activity of silver nanoparticle *Clinacanthus nutans*(AgNps-CN) towards HSC-4 cell lines (oral squamous cell carcinoma cell lines). **Methods:** Methods involved were MTT assay (cytotoxic activity), morphological cells analysis, flow cytometry and cell cycle analysis and western blot. **Results:** MTT assay revealed IC₅₀ concentration was 1.61mg/mL, 3T3-L1 cell lines were used to determine whether AgNps-CN is cytotoxic to normal cells. At the highest concentration (3mg/mL), no cyto-toxic activity has been observed. Flow cytometry assay revealed AgNps-CN caused apoptosis effects towards HSC-4 cell lines with significant changes were observed at G1 phase when compared with untreated cells. Morphological cells analysis revealed that most of the cells exhibit apoptosis characteristics rather than necrosis. Protein study revealed that ratio of Bax/Bcl-2 increased mainly due to down-regulation of Bcl-2 expression. **Conclusion:** AgNps-CN have shown potential in inhibiting HSC-4 cell lines. IC₅₀ was low compared to few studies involving biosynthesized of silver nanoparticles. Apoptosis effects were shown towards HSC-4 cell lines by the increased in Bax/Bcl-2 protein ratio. Further study such as PCR or in vivo studies are required.

Keyword: Silver nanoparticle; *Clinacanthus nutans*; Oral cancer; Flow cytometry