Abstract No: BO-16

Caspase 3/7 activation during apoptotic cell death of human Rhabdomyosarcoma (RMS) and breast adenocarcinoma (MCF-7) cells induced by different fractions of *Chnoospora minima*

M. D. T. L. Gunathilaka[1], K. W. Samarakoon[3], P. Ranasinghe[2] and L. C. D. Peiris[1*]

[1]Department of Zoology (Center for Biotechnology), Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka.
[2]Industrial Technology Institute, Halbarawa Gardens, Malabe, Sri Lanka.
[3]Institute for Combinatorial Advanced Research and Education (KDU-CARE), Research and Development Office, General Sir John Kotelawala Defence University, Rathmalana, Sri Lanka.
dinithi@sci.sjp.ac.lk*

Marine seaweeds are a rich source of bioactive metabolites that can be used as a source for the development of anti-cancer drugs. Apoptosis is a form of programmed cell death involved with the elimination of unwanted cells from the body. Among different mechanisms of apoptosis, caspases are a family of protease enzymes playing an essential role in apoptosis. Therefore, the present study was aimed to determine the caspase 3/7 activation in human rhabdomyosarcoma (RMS) and breast adenocarcinoma (MCF-7) cells following treatment with hexane and chloroform fractions of the seaweed species *Chnoospora minima*. The apo-one homogenous caspase 3/7 activity of treated cells was evaluated according to the manufacturer`s instructions (G7790, Promega, USA). Polysaccharide depleted polyphenol-rich methanol extract was sequentially partitioned with hexane, chloroform, and ethyl acetate to determine the cytotoxic activity. Based on the results, hexane and chloroform fractions of *C.minima* were selected to determine the caspase 3/7 activation of human RMS and MCF-7 cells. The caspase 3/7 activation was quantified by relative flurescence unit (RFU). The chloroform fraction ($RFU_{4\ hrs}$:3932.9) of *C.minima* showed prominent activation of caspase 3/7 in RMS cells after 4 h of caspase treatment more than the hexane fraction ($RFU_{4\ hrs}$:2556.6) compared to the standard Staurosporine ($RFU_{4\ hrs}$:3417.5) and cycloheximide ($RFU_{4\ hrs}$:2950.5). In contrast, hexane ($RFU_{3\ hrs}$:1496.9) and chloroform ($RFU_{3\ hrs}$:1464.7) fractions treated MCF-7 cells showed low caspase 3/7 activation, and the highest activity was observed after 3 h of caspase treatment. Hence, it can be concluded that the hexane and chloroform fractions of *C.minima* induce apoptosis in RMS cells more prominently via the caspase 3/7 pathway compared to the MCF-7 cells. Therefore, further studies should be conducted to confirm the activity of caspase 3 and 7 via gene expression analysis.

Keywords: Anti-cancer, RMS, MCF-7, *Chnoospora minima*, Caspase 3/7

Acknowledgement
The work was supported by the University of Sri Jayewardenepura under the research grant ASP/01/RE/SCI/2017/50.