

11th World Congress on

Pharmaceutical Sciences and Innovations in Pharma Industry

February 27-28, 2017 Amsterdam, Netherlands

Anti-cancer potential of water-soluble peptide extract of Cheddar cheese: An innovation in pharmaceuticals

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Growing perception concerning diet and health has extended the need to exploit the nutritious, biologically active and sustainable food products. In this context, exploitation of bioactive peptide shares an exciting technological and scientific potential for their thriving applications. The pharmaceuticals, dietary supplements, functional and novel foods can be enriched with bioactive peptides for specific health benefits via nutrition. The present study was designed to evaluate the potential role of water-soluble peptides (WSPs) extract derived from buffalo and cow milk Cheddar cheeses with special reference to anti-cancer activities. Purposely, the WSPs fractions collected at different stages of cheese ripening were subjected to assess the cell viability, cell cycle arrest and apoptosis using lung (H1299) and colon (HCT-116) cancer cell lines. Cheese extracts of 120, 150 and 180 of ripening days showed marked anti-proliferation activity towards cancer cells in dose-dependent fashion. The extracts also caused significant changes in cell cycle distribution in comparison to the control cells. The substantial dose-dependent increase in the percentage of cells population in G0/G1 phase was observed in colon cells while WSPs extracts induced G2/M phase cell cycle arrest in lung cancer cell line at rate of 400 µg/mL and 500 µg/mL. Moreover, these extracts also induced extensive early and late apoptosis in all cancer cells. In conclusion, the promising health potential of Cheddar cheese can offer a perspective to reduce the risk of disorders associated with cancer.

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