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Assessment of inhibitory effects of Ficin-hydrolyzed gelatin derived from squid (*Uroteuthis duvauceli*) on breast cancer cell lines and animal model

Marine novel natural products have been applied for cancer therapies. Enzyme-digested gelatin hydrolysates have proven to serve as promising sources of potent biologically active peptides. Potential anti-breast cancer properties of the extracted Ficin-digested gelatin hydrolysate from Indian squid (*Uroteuthis duvauceli*) extensively characterized by cellular and animal models. Gelatin was extracted from squid skin, hydrolyzed by Ficin, and characterized by standard physio-chemical methods. Ficin-digested gelatin hydrolysate was used at various doses of 0-0.1 mg/mL for treatments of MCF-7 and MDA-MB-231 breast cancer cells versus HUVEC normal cells. Cytotoxicity, phase-contrast morphological examination, apoptosis/necrosis, clonal-growth, cell-migration, Matrix-metalloproteinases (MMPs) zymography, and Western blotting were used for cellular assessments. For animal studies, breast tumor-induced BALB/c mice received hydrolyzed gelatin regimen, followed by tumor size/growth

and immune-histochemical analyses. Significant inhibition of MCF-7 and MDA-MB-231 with no cytotoxicity on HUVEC cells was detected. Apoptosis was increased in cancer cells, as revealed by elevated ratio of cleaved caspase-3 and PARP. MMP-2 and MMP-9 activities in both cancer cells were dramatically diminished. In mice, gelatin hydrolysate prevented weight loss, decreased tumor size, induced p53, and down-regulated Ki67 levels. These findings suggest that Ficin-digested gelatin hydrolysate could be a beneficial candidate for novel breast cancer therapies.

Speaker Biography

M Reza Khorramizadeh, is a Full Professor at Tehran University of Medical Sciences (TUMS), directs Biosensor Research Center and newly instituted Zebra fish Core Lab at Endocrinology and Metabolic Molecular-Cellular Sciences Institute. Concurrently, he is a 2nd affiliation to the Dept. of Medical Biotechnology, School of Advanced Technology in Medicine, TUMS.

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