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Cytotoxic effect of peptides isolated from sea cucumber, *Holothuria parva*, muscle protein hydrolysis on the breast cancer cell line (4T1)

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Marine fauna, due to have secondary metabolites, are from the most important natural resources with source of biological activity. With the development of marine drugs, biotechnological studies for identifying and isolating of bioactive compounds from the marine fauna, especially invertebrates, has increased. So that in the marine environment, the role of marine invertebrates including echinoderms is quite striking. The sea cucumber is more interested because of long-standing experience in traditional medicine and having high protein. So far, the presence of bioactive compounds with antioxidant, anticoagulant and anticancer effects in the total extract of sea cucumbers has been reported in many research publications. In the present study, the goal of study was investigating the cytotoxic effect of peptides extracted were isolated from hydrolyzed protein of the sea cucumber muscle, *Holothuria parva*, by using the ultra-filtration method on the breast cancer cell line (4T1). Sea cucumber samples were collected from inter-tidal area of Persian Gulf and transport to the laboratory in containers of ice. Hydrolyzed protein of sea cucumber muscle extracts were prepared by using of Alcalase enzyme. In the following, the peptide were isolated from hydrolyzed protein of the sea cucumber muscle, using ultra-filtration method. (The peptide used were in 4 different fraction: over 30 kDa, 30-10 kDa, 10-3 kDa and less than 3 kDa peptide). The cytotoxic effect of these peptide were studied, using of MTT assay in the concentration of 0.5, 1 and 2 mg/ml on peptides over 30 kDa and the concentrations of 1.5 and 3 mg/ml on peptides 30-10 kDa and the concentrations of 1.5 and 3.5 mg/ml on peptides 10-3 kDa and the concentrations of 2.5 and 3.5 mg/ml on peptides less than 3 kDa in 2 different times 24 and 72 hours on the 4T1 breast cancer cell line with a density of 10⁴ cells in per well. The results of MTT assay showed that, the isolated peptides possess cytotoxic effect, and the most cytotoxic effect between fractions, was observed in >30 kDa peptides at a concentration of 2 mg/ml in the 24 hour. Due to cytotoxic of these peptides on breast cancer cell line, bioactive Compounds derived from this species after purification, can be a suitable candidate for anti-tumor and anti-cancer studies.

Biography

Samira Besharati has completed her Bachelor of Science in Marine biology from Shahid Beheshti university, *Tehran*, Iran at the age of 23 years and Master Science studies at the age of 26 years from Tarbiat modares University, *Tehran*, Iran. Her Thesis topic was: Biotechnology [Cytotoxic Properties of Hydrolyzed Protein of Sea Cucumber Muscle on the Breast cancer cell line (4T1) by Using of Na⁺/K⁺ATPase]. Saber Khodabandeh has her Supervisor. She has several published papers in journals and she Attended two conferences. Saber Khodabandeh has completed his PhD in 2004 from University of Montpellier II, FRANCE in Eco-physiology of aquatic animal and postdoctoral studies in Molecular Biology, obtained from University of St Andrews, Scotland. His recent interests including: 1) Effects of different ecological factors on some bioactive materials concentration in sea animals (Marine Biotechnology, isolation and protective effect of some bioactive materials on different stresses in cultured cells). 2) Use of the Molecular Biology techniques in Aquaculture. 3) Investigation on effects of the different ecological factors on physiology (survival, body composition, energy metabolism, growth and osmoregulation) in the aquatic animals. He has published more than 25 papers in reputed journals and has been serving as an editorial board member of repute.

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