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Effects of hypobranchial glands and squid ink protein extracts from three Mediterranean molluscs on human glioblastoma U87 and HeLa cell line epithelia cervix carcinoma

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Background & Aim: The aim of this study is to evaluate the effects of tree Mediterranean molluscs co-product protein extracts on human glioblastoma U87 and HeLa cell line epithelia cervix carcinoma. Hypobranchial gland proteins (HGPE) are extracted from the gastropods *Hexaplex trunculus* (HT) and *Bolinus brandaris* (BB). The squid ink proteins are extracted from the cephalopod *Sepia officinalis*.

Methods: Proteins are extracted by acetone precipitation. Cell viability is measured using MTT assay. Cell adhesion and migration are established using fibrinogen as matrix.

Results: Both HGPE HT and BB are non-cytotoxic substances until 20 mg/ML. They decrease by more than 50% at 25 mg/mL. All HGPE significantly impair migration of U87 cells towards fibrinogen in a concentration dependent manner. Concentrations for 50% inhibition (IC_{50}) of male and female HGPE HT are of 3.7 and 4 mg/mL, respectively. They are of 4.2 and 5.8 mg/ml for male and female HGPE BB, respectively. Squid ink proteins block the migration of U87 to fibrinogen in a dose dependent manner. The IC_{50} is about 9.2 µg/mL. This supernatant also inhibits cell adhesion U87 on various types of matrices. Inhibitions are 60% fibrinogen and 25% fibronectin. Similarly, HGPE of both HT and BB inhibits HeLa cell adhesion to fibrinogen at 50 mg/mL. Male and female inhibitions significantly impair at 10 mg/mL and continue until 20 mg/mL. Squid ink proteins inhibit also HeLa cell adhesion. Inhibition significantly impairs at 10 mg/ML and continues until 30mg/mL.

Conclusion: HGPE HT, HGPE BB and squid ink proteins may have the potential to serve as a model for future anticancer-drugs development.

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Design and synthesis of variety of molecules with specific bioactivity

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Our research group has been engaged in the design and synthesis of variety of molecules with specific bioactivity for 30 years. Numbers of series of novel compounds were designed, synthesized and evaluated for their antibacterial, anti-TB or antitumor activity. In the antibacterial drug development area, we are focused on new quinolones targeting on topoisomerase II, and two candidate IMB-031124 (Chinfloxacin) and IMB-070593 have been completed for Phase I clinical trials and preclinical trials in China, respectively. In the anti-TB area, many compounds with totally new structural scaffolds were discovered in our lab to have nanomolar activity again drug-sensitive and -resistant MTB strains. And in the antitumor area, we are mainly working on the NO/H2S-releasing non-steroidal anti-inflammatory drugs (NSAIDs) and receptor tyrosine kinase (RTK) inhibitors. Currently, hundreds of compounds synthesized in our lab are evaluated for their antitumor activity.

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