Translational Medicine-2013

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Translational Medicine

August 5-7, 2013 Holiday Inn Chicago-North Shore, USA

Translational research based on the potential of refined deep-seawater (RDSW) which may control tumor growth

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Abstract

We evaluated the potential effect of high-mineral RDSW on tumor growth *vitro* and *vivo*.

Materials and Methods: RDSW was prepared from deep-seawater off Muroto in Kochi. The deep-seawater was desalinated and conditioned to give 5 magnesium:calcium ratios of 1:2, 1:1, 3:1, 1:0 and 0:1 at hardness of 1000, expressed by 5 high-mineral RDSWs. The RDSWs and distilled waters were used as test and control waters, respectively. Tumor cells used were MKN-45 and Hela cells. Tumor cells cultured in RPMI1640 medium prepared by each water were subjected to MTT assay for cell viability. The animals (15 male nude mice in each 6 group) were allowed free access to test or control waters during experiment. Tumor cells were injected in the subcutaneous part of posterior cervical region. Two weeks later, the animals were sacrificed and tumors grown and sera were obtained. All tumors were subjected to western blotting (WB) with sera from all animals to evaluate the immuno-reactivity and antibody profile was compared among 6 groups. Based on the differences from antibody profiling, noteworthy 50-kDa proteins were analyzed by LC-MS/MS.

Results:Comparison with control, 62-79% (MKN-45) and 72-85% (Hela) in cell viability, 54-80% (MKN-45) and 32-74% (Hela) in tumor volume, were observed with statistical significance. Therefore, high-mineral RDSWs potentially possess a repressive effect on tumor growth. LC-MS/MS identified 44 (MKN-45) and 22 (Hela) proteins as candidate determinants involved in this phenomenon. More investigations including cloning, preparation of fusion proteins and WB, turn to 9 (MKN-45) and 5 (Hela) proteins so far.

Biography

Yoshihiro Hataguchi graduated from Himeji Institute of Technology University (1995) and belongs to Technical development division of Ako kasei Co., Ltd. One of the company's management policies is to devote to healthy human life by producing a variety of high quality and effective foods and liquids with original technology. Yoshihiro Hataguchi, a section chief, is working to research and develop new goods based on deep-seawater which possess functional effect in vivo.