World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:9, No:02, 2015

Anti-Prostate Cancer Effect of GV-1001, a Novel Gonadotropin-Releasing Hormone Receptor Ligand

Authors : Ji Won Kim, Moo Yeol Lee, Keon Wook Kang

Abstract : GV-1001, 16 amino acid fragment of human telomerase reverse transcriptase catalytic subunit (hTERT), has been developed as an injectable cancer vaccine for many types of solid tumors showing high-level of telomerase activity. In the present study, we evaluated the anti-cancer effect of GV-1001 on androgen-receptor-positive prostate cancer. Two signaling pathways, Gs-adenylate cyclase-cAMP and Gq-IP3-Ca2+ pathways play a central role in GnRH receptor (GnRHR)-mediated activities. We found that leuprolide acetate (LA) mainly acted on Gq-mediated Ca2+ signaling, while GV-1001 preferentially acted on cAMP signaling; and both the effects were counteracted by cetrorelix, a GnRHR antagonist. We further tested whether GV-1001 affects tumor growth of human prostate cancer cells in vivo. Prostate tumor xenografts were established using LNCap, androgen receptor-positive prostate cancer cells, and the nude mice bearing tumors were subcutaneously injected with GV-1001 (0.01, 0.1, 1, 10 microg/kg/day) and LA (0.01 microg/kg/day) for 2 weeks. GV-1001 (1 and 10 microg/kg/day) significantly inhibited tumor growth of LNCap xenografts. Interestingly, mRNA expression of MMP2 and MMP9 was significantly suppressed by GV-1001 injection, but not by LA administration. Boyden chamber assay revealed that GV-1001 potently inhibited cell migration of LNCap. Our finding suggests that GV-1001 as a novel GnRHR ligand, has anti-proliferative and anti-migratory effects on androgen receptor-positive prostate cancer cells.

Keywords : GV-1001, GnRH, hTERT, prostate cancer
Conference Title : ICCST 2015 : International Conference on Cancer Science and Therapy
Conference Location : Barcelona, Spain
Conference Dates : February 26-27, 2015