VT-2012

Effects of Military Jet Fuel (JP5) on the Cell Proliferation of Testicular Mouse Cell Line (TM3). KATE LEDBETTER, BS and James W. DuMond, Jr., Ph.D. Department of Biology, Texas Southern University, 3100 Cleburne Ave., Houston, TX 77004. E-mail: Dumond_jw@tsu.edu

In this study, we examined the influence of the military jet fuel (JP5) on the proliferation of TM3 Leydig cells, a normalized mouse cell line. Cells were grown in D-MEM/F-12 culture media containing 5% horse serum and 2.5% fetal bovine serum. The cells were allowed to attach to the flasks for 24 hours, and then the cells were switched to serum free media. Treatments consisted of 1pg, 10pg, 100pg, 1ng, 10ng, and 100ng per ml of the test chemical along with a control. Cell growth was measured at a 72 hr period via a hemacytometer. Treatment with JP5 resulted in significant ($P<0.05$) increases in cell proliferation at 1ng/ml (120.11%), 10ng/ml (123.51%), and 100ng/ml (123.08%). This data is suggestive of a role for JP5 in testicular cancer and may help account for the increase incidence rates of testicular cancer in military personnel.

VT-2013

Suppression of Two-stage Cell Transformation by Electrolyzed Reduced Water/Platinum Nanocolloids. R. NISHIKAWA, K. Teruya, Y. Katakura, K. Otsubo, S. Morisawa, and S. Shirahata. Dept. of Genetic Resources Technology, Faculty of Agriculture, Kyusyu Univ., 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan and Nihon Trim Co., Ltd, 1-8-34 Kita-ku, Oyodonaka, Osaka 531-0076, Japan. E-mail: ryuhein@hotmail.com

According to the two-stage cell transformation theory, cancer cells first receive initiation, which is mainly caused by DNA damage and then promotion, which enhance transformation. Murine Balb/c 3T3 cells have widely been used for transformation experiments because the cells lose contact inhibition ability when transformed. Electrolyzed reduced water (ERW) is a health beneficial alkaline drinking water which contains high concentration of dissolved hydrogen and can scavenge intracellular reactive oxygen species (ROS). We have revealed that ERW contains a small amount of platinum nanocolloids as atomic hydrogen (active hydrogen) donors and ROS-scavengers. Therefore, ERW containing synthesized platinum nanocolloids (ERW/Pt) can be considered as a model of strong ERW. Here, we report that ERW/Pt can prevent transformation of Balb/c 3T3 cells. ERW was prepared by electrolysis of 0.002 M NaOH solution using a batch-type electrolysis device (Type TI-200S, Nihon Trim Co., Osaka, Japan). BALB/c 3T3 cells were treated with 3-methyl cholantrene (MCA) as an initiation compound, followed by the treatment with phorbol-12-myristate-13-acetate (PMA) as a promotion compound. Transformation focus was strongly suppressed by co-treatment of MCA/PMA and ERW/Pt. ERW/Pt suppressed the transformation at the stage of promoter but not at the stage of initiation, suggesting that it suppressed the augmentation of intracellular ROS by PMA.

VT-2014

Suppression of Invasion of Cancer Cells and Angiogenesis by Electrolyzed Reduced Water. Y. JUN, K. Teruya, Y. Katakura, K. Otsubo*, S. Morisawa*, and S. Shirahata. Dept. of Genetic Resources Technology, Faculty of Agriculture, Kyusyu Univ., 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan and *Nihon Trim Co., Ltd. 1-8-34 Oyodonaka, Kita-ku, Osaka 531-0076, Japan. E-mail: junye@grt.kyushu-u.ac.jp

Invasion and metastasis of cancer cells are main causes of cancer patient's death. Cancer cells also secret VEGF, which stimulates angiogenesis to develop tumor tissues. The suppression of invasion/metastasis and angiogenesis is an urgent target for prevention of cancers. Electrolyzed reduced water (ERW) is anti-oxidative water, which contains high concentration of dissolved hydrogen and can scavenge intracellular reactive oxygen species (ROS). ERW contains a small amount of platinum nanocolloids as atomic hydrogen (active hydrogen) donors and ROS-scavengers. Here, we report the effect of ERW on invasion of human fibrosarcoma HT1080 cells and HT1080 cells-induced angiogenesis. ERW was prepared by electrolysis of 0.002 M NaOH solution using a batch-type electrolysis device (Type TI-200S, Nihon Trim Co., Osaka, Japan). ERW scavenged hydrogen peroxide both in cells and medium. The RT-PCR and zymographic analysis revealed that ERW suppressed the expression and activation of matrix metalloproteinase-2 (MMP-2). ERW was estimated to inhibit invasion by suppressing the phosphorylation of p38 MAP kinase. ERW also suppressed the expression and secretion of VEGF in HT1080 cells by suppressing the phosphorylation of ERK MAP kinase. ERW suppressed the HT1080 cells-induced angiogenesis by human blood endothelial cells, suggesting that ERW may be useful for prevention and treatment of cancer.

VT-2015

Establishment and Characterization of Cell Lines from 3 Human Thyroid Carcinomas: Responses to All-*Trans*-Retinoic Acid and Mutations in the BRAF Gene. J.-L. KU, C.-S. Koh, S.-Y. Park, J.-H. Park, I.-J. Kim, H. C. Kang, Y.-K. Shin, S.-K. Oh, J.-K. Chung, J.-H. Lee, W. H. Kim, C. W. Kim, B. Y. Cho and J.-G. Park. Korean Cell Line Bank, Laboratory of Cell Biology, Cancer Research Institute, Seoul National University College of Medicine, Seoul 110-744, Korea; Departments of Internal Medicine, Surgery, Nuclear Medicine and Pathology, Seoul National University College of Medicine, Seoul, Korea; and Research Institute and Hospital, National Cancer Center, Goyang, Gyeonggi 411-764, Korea. E-mail: kujalok@cell.snu.ac.kr

Human cell lines established from thyroid carcinomas are rare. We report the characteristics of three cell lines (designated, SNU-80, SNU-373 and SNU-790), which were established from two pathologically-proven papillary carcinomas and one anaplastic carcinoma of three Korean thyroid carcinoma patients. All cell lines grow as adherent cells. Electron microscopy characteristically showed cytoplasmic invaginations of nuclei and intranuclear cytoplasmic inclusions. SNU-80 and SNU-790 cells showed a positive reaction to anti-cytokeratin antibody, and SNU-790 cells positivity for CK-19. All lines were free of mycoplasma or bacteria and were proven unique by DNA fingerprinting analysis. The *p15* and *p16* genes are deleted in the SNU-790 line. Mutations of the *p53* gene were found in two lines (SNU-80 and SNU-373), but no mutations in the *RET* and *MEN1* genes were observed. Mutations of the *BRAF* gene were found in the SNU-80 (G468R) and the SNU-790 (V599E) cell lines, but no mutations in the *K-ras* gene were present. SNU-80 and SNU-790 cells showed a positive reaction to anti-cytokeratin antibody, and no evidence of the production of thyroglobulin or calcitonin was observed. The cell lines were unable to trap radioactive iodine and did not have TSH receptor. In addition, we investigated the mRNA expression levels of Tg, TSHR, TTF-1, PAX-8, NIS, IL-6, and LIF, and of the α, β and γ retinoic acid receptors in these cell lines. IL-6 was down-regulated in all three cell lines by all-*trans*-retinoic acid treatment. RAR-α was expressed but RAR-β was not expressed in three cell lines. RAR-γ was not expressed in SNU-790. Interestingly, RAR-β (SNU-80 and SNU-373) and RAR-γ (SNU-790) was up-regulated by all-*trans*-retinoic acid treatment. We believe that these well-characterized thyroid carcinoma cell lines may be useful tools for investigations of the biological characteristics of thyroid carcinoma, particularly for investigations related to gene alterations, especially of the *BRAF* gene. These cell lines may be also useful cell lines for the redifferentiation therapy study for thyroid carcinoma using all-*trans*-retinoic acid.