Learning to Care for Those in Harm's Way

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News Release

Crystalline Compound found in Asian Medicine, Cuisine Shown to be Cancer Chemopreventive

BETHESDA, Md.—A collaborative team of scientists from the Uniformed Services University of the Health Sciences (USU) will have a study of the effects of curcumin in prostate cancer cells published in the September 2008 issue of *Cancer Biology and Therapy.*

Curcumin (diferuloylmethane), a crystalline compound, is the major active component of turmeric (*Curcuma longa* Linn), which has been traditionally used in medicine and cuisine in Asian countries. Curcumin has shown to be cancer chemopreventive in several different model tumor bioassay systems including colon, duodenal, stomach, prostate and breast carcinogenesis both *in-vitro* and *in-vivo.*

Dr. Radha Maheshwari, professor of Pathology, USU; Dr. Rajesh Thangapazham, graduate student of Birla Institute of Technology and Science, Pilani; Dr. Rajesh Thangapazham, at the Department of Pathology in collaboration with Drs. Shiv Srivastava, Albert Dobi and colleagues at the Center for Prostate Disease Research, Department of Surgery, USU, performed a temporal gene expression analysis of the Curcumin-Gene Expression Response using hormone-responsive and non responsive human prostate cancer cell line, LNCaP and C4-2B respectively.

Hierarchical clustering methods and functional classification showed temporal co-regulation of genes involved in specific biochemical pathways involved in the cellular stress response pathways. Androgen Receptor (AR) regulated genes which play critical roles in normal growth and differentiation of prostate gland, as well as in prostate cancer, were also a part of the observed gene expression alteration. NKX3.1, TMPRSS2 and PMEPA1 were downregulated by curcumin. Of note curcumin down-regulated androgen upregulated transcript encoded by the potentially causal TMPRSS2-ERG gene fusion, a common oncogenic alteration noted in 50-70% of prostate cancer patients. This report established novel features of curcumin in prostate cancer cells of varying tumorigenic phenotypes and provides potentially novel read-outs for assessing effectiveness of curcumin in prostate cancer and likely in other cancers. Specifically known as well as new gene-networks identified here further delineate molecular targets of curcumin in prostate cancer cells.

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The current study was supported by grants from the US Military Cancer Institute, Uniformed Services University of the Health Sciences and US-INDIA Foreign Currency Fund from the US Department of State.

The Uniformed Services University is located on the grounds of Bethesda's National Naval Medical Center and across from the National Institutes of Health. The university is the nation's federal school of medicine and graduate school of nursing. It educates health care professionals dedicated to career service in the Department of Defense and the U.S. Public Health Service. Students are active-duty uniformed officers in the Army, Navy, Air Force and Public Health Service, who are being educated to deal with wartime casualties, national disasters, emerging infectious diseases, and other public health emergencies. Of the university's more than 4,200 physician alumni, the vast majority serve on active duty and are supporting operations in Iraq, Afghanistan, and elsewhere, offering their leadership and expertise.

For more information, contact the Office of External Affairs at 301-295-1219.

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