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Enhanced chemo-preventive effect by combining quercetin and green tea in prostate cancer

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The chemo-preventive activity of green tea (GT) in prostate cancer has been well demonstrated in preclinical cell culture and animal models. However, results from human studies are inconsistent. The low bioavailability and extensive metabolism of GT polyphenols (GTPs) *in vivo* limit the anti-cancer activity of GT. We found in human prostate tissues and in mouse xenograft prostate tumor tissues that around 50% of GTPs were in methylated form after GT consumption and the methylation decreased the anti-cancer activity of GTPs. We were able to demonstrate that the combination of a natural methylation inhibitor quercetin (Q) with GT increased the cellular concentrations of GTPs 4-10 fold in prostate cancer LNCaP and PC-3 cells and decreased the methylation of GTPs. The combination treatment enhanced the inhibition of cell proliferation and induction of apoptosis in both cell lines. Then we performed an animal study to confirm the combined effect of GT and Q *in vivo*. Severe combined immune deficient (SCID) mice were implanted with androgen-sensitive LAPC-4 prostate cancer cells and treated with GT, Q, GT+Q or control. After 6-weeks intervention the tumor growth was inhibited by 16% (Q), 21% (GT), and 45% (GT+Q) compared to control. The tissue concentrations of non-methylated GTPs were significantly increased in the combination group. The combination enhanced the inhibition of protein expression of androgen receptor, prostate-specific antigen and vascular endothelial growth factor. This study provides a novel regimen by combining GT and Q to enhance the chemoprevention of prostate cancer in a non-toxic manner.

Biography

Piwen Wang received his MD degree in 2000 and MS degree in 2003 from Shandong Medical University, China. He has completed his PhD degree in 2008 from Texas Tech University and Post-doctoral studies at the UCLA Center for Human Nutrition. He is currently an Assistant Professor in the Department of Internal Medicine, Division of Cancer Research and Training at Charles R Drew University of Medicine and Science. He has published more than 20 papers in reputed journals and has been serving as a peer reviewer for a number of scientific journals.

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