Cancer Prevention Research

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EDITORIAL

RESEARCH ARTICLES

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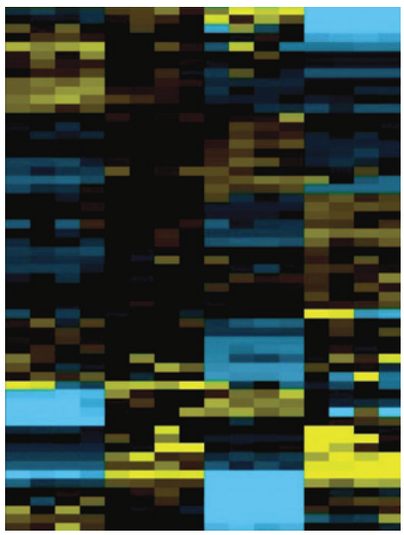
ABOUT THE COVER



Tocopherols (T), consisted of α-, β-, δ- and γ-T forms, have been tested for their anti-cancer activities in different models of cancer prevention, but the differences among individual forms of tocopherol remain unclear. For an unbiased understanding of the mechanisms underlying the anti-cancer activity of the different forms of tocopherol, high-throughput RNA-seq analysis was performed on mammary tumors from ACI rats treated with estrogen and α-, δ- or γ-T. The cover image shows a heatmap of the clustered genes regulated by the different tocopherols. α-T (the first set of columns), which did not significantly inhibit the growth of rat mammary tumors compared to the estrogen control (the second set of columns), had minimal effect on the transcriptome (47 differentially expressed genes). Moreover, the 5 genes upregulated by α-T were unique, sharing no common genes with δ- or γ-T. γ-T (the third set of columns), which was most effective in inhibiting mammary tumorigenesis, had the most profound influence on the rat transcriptome, leading to the differential expression of 192 genes. δ-T (the fourth set of columns), with moderate tumor inhibitory potential, modulated the expression of 51 genes. IPA analysis identified 'Cancer' as a top disease pathway and 'Tumor growth' and 'Metastasis' as the top signaling pathways modulated by γ-T. This study presents an unbiased attempt to understand the differences between biological activities of individual forms of tocopherol. The current study has identified the top genes and biological networks modulated by individual tocopherols at the whole transcriptome level, providing new insights into their differential chemopreventive activities. See the article by Das Gupta et al. (beginning on page 694) for more information.

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