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Role of vitamin E and vitamin E derivatives in Cancer treatment and in offsetting toxicity by Chemotherapy

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Abstract

Recent epidemiological studies reveal that 35 % of cancer initiation may be related to food, lack of nutrition and sedate lifestyle. However, it is hard to connect directly which ingredient of which food and how long it takes to develop cancer. Although Vitamins including Vitamin E have several favourable health related properties, translating them to therapeutic dose using food matrix is hard which necessitates new formulation, supplements and delivery through a novel drug releasing technology. Chemotherapy, despite widely used for treatment of cancer is nonspecific resulting in the collateral damage to normal cells. Vitamin E is an antioxidant which can help repair the DNA damage to normal cells induced by chemotherapy. In order to deliver the optimum dose, Vitamin E was esterified with pegylation to make it water soluble and administered orally. The esterase enzyme available in the body hydrolyses the ester bond to release Vitamin E to reach the therapeutic level. On the other hand, the same Vitamin E was derivatized using a dipeptide linker which is cleaved by tumour specific enzyme which is overexpressed by cancer cells. The technology is often referred to as "A Priori Activation of Apoptosis Pathways of Tumour" AAAPT. Cancer cells are known for desensitizing themselves to intervention. AAAPT identified several dysregulated pathways to sensitize those cells which do not respond to chemotherapy. Targeted tumour sensitizing technology enables to expand the therapeutic index of current FDA approved chemotherapy by lowering the therapeutic dose without reducing efficacy. Optimization of drug design using Vitamin E resulted in reducing cardiotoxicity of the current chemotherapy drugs.

Biography

Raghu Pandurangi started his scientific career Ph.D. in spectroscopy followed by post-doctoral training at Radiology and Internal medicine, University of Missouri, Columbia where he remained as a faculty for 10 years teaching radiopharmaceuticals and chemistry and guided graduate students with funds from American Heart Association and NIH funding. He was a principle investigator in Schering AG, Germany where he directed and involved in 2 FDA approved drugs (AccuTect and NeoTect). He was a team leader at Mallinckrodt directing apoptosis imaging. He became an entrepreneur in 2013 inventing AAAPT technology for improving FDA approved drugs. Currently, he is the Founder, President and CSO of Sci-Engi-Medco Solutions (SEMCO) and Amplexi-LLC, recipient of several NIH grants and awards. He also an ardent percussionist (Tabla) and VP for Anu-Rag School of Music, A non-profit organization headed by his wife Guru Sandhya Pandurangi.

Publication

1. Priori Activation of Apoptosis Pathways of Tumor (AAAPT) Technology 1: Sensitization of 2 Tumor Cells Using Targeted and Cleavable Apoptosis Initiators in Gastric Cancer, Wu Han, Li Yan, Raghu Pandurangi

2. AAAPT Technology for Improving Chemotherapy, Raghu Pandurangi

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