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The effect of *PTEN* and *TRAIL* genes loaded on nanoparticles on hepatocellular carcinoma

Fathia El Sharkawi, Shaimaa Ewais, Rania Hassan and Laila Rashed
Helwan University, Egypt

Effective therapy to hepatocellular carcinoma (HCC) is currently lacking, creating an urgent need for new therapeutic strategies. Gene therapy approach that relies on the transduction of cells with apoptotic genetic materials such as Phosphatase & Tensin homolog (*PTEN*) and Tumor Necrosis Factor (TNF)-related Apoptosis-Inducing Ligand (*TRAIL*) genes have the potential to become promising anti-tumor therapy reagents and may provide a novel approach for cancer treatment. *PTEN* gene is one of the most frequently mutated genes in a variety of cancers its mutation has been observed in 40% to 50% of HCC tumors has been implicated in regulating cell survival signaling. *TRAIL* gene belongs to the TNF cytokine super-family, it induces apoptosis in a wide variety of transformed cell lines. The killing activity of it is cancer-specific and has little or no effect on most normal cells. The therapeutic genes may be delivered by viral or non-viral vectors. The toxicity associated with viral vectors would preclude them from being used systemically to treat diseases, The success of gene therapy is largely dependent on the development of a vector or vehicle that can selectively and efficiently deliver a gene to target cells with minimal toxicity such as to incorporate genetic materials into functionalized nanoparticles with little toxicity, this demonstrates a new era in pharmacotherapy for delivering genes selectively to tissues and cells. The aim of the current study is to deliver *TRAIL* & *PTEN* genes on suitable nanoparticle as a novel therapy for hepatocellular carcinoma.

Biography

Fathia El Sharkawi has obtained her PhD in Biochemistry and Molecular Biology from Faculty of Pharmacy, Cairo University in 2000. She has completed Postdoctoral studies in Germany from Paul Ehrlich Institute in 2006 and Institute of Virology, Essen University in 2007. She has been working in Faculty of Pharmacy, Helwan University since 2002. She is currently the Head of Biochemistry and Molecular Biology Department. She is a member of many scientific societies and a reviewer for few international scientific journals. She is a member of editorial board of *Austin Journal of Molecular and Cellular Biology*; also she is a member of Tempus project (Advanced Training and Life Long Program in Applied Health Science) with Linnaeus University, Sweden. Her research interests are cancer biomarkers, cancer therapy, hepatocellular carcinoma, gene therapy and genetic variability of different diseases. She had previously worked as manager of scientific development in Kahira Pharmaceutical Company (1995-2000) and as Scientific Affairs and Registration Consultant, Sigma Pharmaceutical Company, Egypt (2000-2008).

felsharkawi@gmail.com

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