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The role of ras signaling in tropomyosin-1 suppression in esophagus cancer

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Esophagus cancer is the sixth most common cause of cancer-related death worldwide that its major subtype is squamous cell carcinoma (SCCE). Despite improvement in multimodality therapy, the survival rate of patients remains low. Therefore, a major research effort has been directed at better understanding of the underlying molecular alterations to provide new treatment. The progression of this tumor is associated with multiple genetic and epigenetic alterations. However, the contribution of Ras signaling pathway in esophageal cancer has not been extensively documented.

Tropmyosins (TM) are a family of cytoskeleton proteins that binds to actin microfilaments. Multiple isoforms of TM are expressed in non-muscle cells, including TM1, TM2, and TM3, which are downregulated in several human cancers. However, little is known about its underlying mechanism.

In this study expression of TM1 was analyzed in SCCE, relative to primary cell culture of normal esophagus, by immunoblot and real-time RT-PCR, also the involvement of Ras dependent signaling in TM1 downregulation further investigated. Our results showed that TM1 expression, both at protein and mRNA level, was significantly decreased in SCCE, relative to normal esophagus cells; indicating the importance of TM1 suppression in tumorigenesis of esophagus cancer. Moreover, inhibition of MEK/ERK and PI3K/Akt effectory pathways of Ras signaling could restore TM1expression in esophagus cancer cells. These data indicate that TM1 suppression occurs basically in SCCE; also activation of MEK/ERK and PI3K/Akt pathways involved in TM1 suppression, provide a new finding of the implication of Ras effectorry signaling in carcinogenesis of esophageal cancer.

Biography

Maryam Zare is the last year Ph.D student of Molecular Genetics in National Institute of Genetic Engineering & Biotechnology (NIGEB), Tehran, Iran. Her researches focused on genetic and epigenetic alterations, such as promoter hypermethylation and signaling pathways in squamous cell carcinoma of esophagus.