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Application of nano-sciences in modification of mechanistic/mammalian target of rapamycin signaling pathway in cancers

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Nanosciences covers a clear majority of devices derived from biology, engineering and basic sciences which contain nanovectors for the drug delivery system in anticancer drugs. There have been available nanoparticles with various characteristics for optimal drug delivery e.g. for increasing their stability in the circulation system and targeted delivery to the tumors by taking the advantage of enhanced permeability and retention effect near the tumor tissue. Evaluation of the mechanisms and therapeutic effects of nanoparticle-based mammalian mechanistic target of rapamycine (mTOR) modulation can be useful in developing safe in treatment of cancer. mTOR is a conserved serine/threonine kinase in the cellular PI3K/Akt/mTOR signaling pathway. This pathway is modified by cellular alterations such as level of energy, growth factors, stresses, as well as the increased environmental level of cancerous cytokines. In general, increase of this kinase protein function is seen in various types of cancers, especially in cancer stem-like cell. Additionally, activation of this pathway in the most common cancers like nervous system is in consideration. Recent studies have shown the relationship between different cellular signaling pathways and genetic mutations, that involved in the cancers, with mTOR pathway. Based on previous studies, different treatments like surgery, chemotherapy, radiotherapy, aren't more effective and have some side-effects. Therefore, the researchers are trying to find better ways to treat cancer. One approach to this aim is about the essence of understanding all molecular pathways, proteins and mutations.

Speaker Biography

Abbas Ebrahimi-Kalan was born in Tabriz, Iran, in 1980. He received the B.Sc. degree in Radiology from the Tabriz University of Medical sciences, Tabriz, Iran in 2004, and the MSc. and Ph.D. degrees in Anatomical sciences from the Tabriz University of Medical Sciences, Tabriz, Iran, in 2006 and 2014, respectively. In 2014, he joined the Department of Cognitive and neurosciences, faculty of advanced medical sciences, Tabriz University of Medical Sciences, Tabriz, Iran; as an assistant professor. His current research interests include neurosciences, regenerative medicine, nano medicine and animal model of Multiple Sclerosis, Spinal cord injury and Alzheimer Disease. He is a Life Member of the Iranian anatomical sciences association and Neurosciences Society.

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