

Inhibiting the expression of anti-apoptotic genes BCL2L1 and MCL1, and apoptosis induction in glioblastoma cells by microRNA-342

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Abstract

Statement of the Problem: GBM (Glioblastoma multiforme) is a grade IV astrocytoma which is the most common type of malignant tumor in the brain. Originating from glial cells, it is an extremely aggressive and lethal type of brain tumor(1,2). Glioblastoma cannot be cured by current common methods. The most important obstacle to improving the therapy is that the central nervous system is heavily protected from systemic immune responses, which causes cancer cells to escape from the immune system and reduce systemic immune function(3,4). miRNAs are noncoding single-stranded RNA molecules of ~21–25 nucleotides in length. miRNAs regulate gene expression by targeting mRNAs, usually in the 3' untranslated region (UTR), in a sequence-specific manner by triggering translational repression or mRNA degradation(5,6). Numerous miRNAs regulate programmed cell death including apoptosis, autophagy-associated cell death and necroptosis(7,8). Numerous miRNAs have been reported to perform specific effects in the regulation of tumor progression and multiple drug resistance(9,10). Some miRNAs can inhibit cancer cell motility and migration and suppress tumor cell growth(11–14). Taking all these into account, miRNA-mediated suppression of anti-apoptotic genes seems a promising strategy to induce apoptosis in cancer cells. Some of the anti-apoptotic genes are BCL2L1(also known as BCL-xl) and MCL1. BCL2L1 is located at 20q11.21 and MCL1 is located at 1q21.2 and belongs to BCL2 family. BCL2 family are regulator proteins that regulate apoptosis including anti-apoptotic and pro-apoptotic

Biography

Shokoofeh Ghaemi obtained her Master in microbiology from University of Tehran, Iran 2018 and now she is a Ph.D. candidate in University of Tehran. She has her expertise in evaluation and passion in improving the health and wellbeing also She is enthusiastic to use a variety of treatments using viruses to treat a variety of

cancers. Her main research interests are cancer therapy, gene therapy and immunotherapy. in corona pandemic, she joined the research team that worked on mRNA vaccine against coronavirus and finally they published their results as an article. She has worked on cancer therapy using viruses.