Title: Therapeutic effect of microRNA-21 on differentially expressed hub genes ingastric cancer based on systems biology

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Abstract:

Gastric cancer (GC) is a leading cause of mortality for many people. Cancer's initiating factors are poorly understood. miR-21 has a crucial function in several malignancies, particularly GC. Furthermore, it has been shown that miR-21 is critical for the emergence and advancement of GC. This work intends to identify new genes which expression is associated with the activity of mir-21 in GC and to investigate the effect of downregulation of mir-21 on these genes and gastric tumorigenesis. We utilized the gene expression profiles of GCs from an Array database (GSE13911) from the Gene Expression Omnibus (GEO) dataset to find differentially expressed genes (DEGs) between control and gastric cancer groups. Using weighted gene correlation network analysis (WGCNA) in R, the Gene co-expression network was reconstructed. The microRNA–mRNA network was then reconstructed using the miRWalk database, and by investigating the microRNA–mRNA network, the genes that have an association with mir-21 were found. To implement the functional investigation, MKN and AGS cell lines were transfected with anti-miR-21 next. Subsequently, MTT proliferation was utilized to assess the cell's vitality. qRT-PCR was then used to evaluate the anticipated levels of gene expression in both GC cell lines. This study discovered and predicted CCL28, NR3C2, and SNYPO2 as the targets of miR-21 (GC), which are downregulated through gastric tumorigenesis, showing great potential as therapeutic and diagnostic targets. The suppression of miR-21 in gastric GC cells led to the inhibition of cell proliferation and decreased expression of CCL28, NR3C2, and

SNYPO2 genes. This study established that miR-21, via downregulating these genes, contributes significantly to the development of GC. In addition, systems biology techniques identified CCL28, NR3C2, and SNYPO2 genes as possible GC surveillance and therapy components.

Biography:

Hesam Ghafouri Kalajahi, a dedicated Ph.D. student at Koc University and a researcher at the Koc University Research Center for Translational Medicine in Istanbul, Turkey, has a strong academic background in biotechnology, earning both his bachelor's and master's degrees in the field.

Proficient in leading thesis projects, Hesam has showcased his expertise through notable contributions to cancer research, with a particular focus on gastric cancer. His groundbreaking work led to the publication of his thesis on gastric cancer in Scientific Reports. This influential publication highlights his discovery of novel genes that hold significant promise as potential biomarkers for the early diagnosis of gastric cancer. This pioneering research not only adds valuable insights to the field of cancer research but also emphasizes Hesam's commitment to advancing our understanding of gastric cancer, a crucial aspect of broader cancer studies.

Hesam Ghafouri Kalajahi's achievements underscore his passion for translational medicine and his potential to make lasting contributions to the field. As he continues his journey as a Ph.D. student and researcher, his work holds promise for shaping the future of cancer diagnostics and treatment strategies.