ISSN: 2161-0436

The wonders of CRISPR to cancer therapy

Kimia Sadat Esfahani,
Islamic University, Iran.

Introduction:

Statement of the Problem:

Cancer is the second reason for mortality worldwide, and the average age of occurrence experienced a decrease each year. Traditional treatments include surgery, chemotherapy, and radiotherapy, but the high rate of recurrence, resistance to chemotherapy, and other side effects are incredibly caused. While gene therapy offers stable treatment compared to traditional treatments. The present study reviews new methods of cancer treatment through gene therapy and CRISPR.

Methodology & Theoretical Orientation:

Mutations or epigenetic changes in proto-oncogenes, tumor suppressor genes, and DNA repair genes disrupt the regulation of subsequent signaling pathways and trigger cancer. The CRISPR system is used as a powerful DNA editing tool for various cell types. Cas endonuclease is directed to doublestranded DNA by non-coding RNA transcripts strands at the desired location, followed by direct or random ligation of the DNA. Effective delivery of the CRISPR/Cas gene editing system to cancer cells is crucial for its utility in cancer therapy. In general, three delivery strategies (in vitro, ex vivo and in vivo) have been investigated for cancer gene therapy.

Findings:

The CRISPR/Cas9 system has aided in the generation of engineered CAR-T cells targeting leukemia or lymphoma. The effective strategy to edit the genome which may affect the treatment of lung adenocarcinoma is the PNO1/CRISPR/Cas9 technique. Evidenced treatment of cervical carcinoma by CRISPR/Cas9 through targeting HPV E6 and E7. The DNMT1 gene was targeted by CRISPR/Cas9 due to its high level of aberrant methylation in tumor cells and slowed tumor growth in vivo.

Conclusion & Significance:

In the future, thanks to the significant advances in gene therapy and CRISPR, including the ability to effectively delete and edit genes, the accuracy and high efficiency of the CRISR/CAS9 system also other CRISPR systems, including Cas12a,Cas3(with Cascade), Cas13, dCas9,and nCas9,we can witness the complete treatment of cancer patients.

Biography:

Kimia Sadat Esfahani, at the age of 22, she received her Bachelor's degree from Azad University in the field of Cellular and Molecular Biology, and She is currently studying for a Master's degree in the field of Molecular Genetics at the Faculty of Advanced Sciences and Technology of Tehran Medical Sciences, Islamic Azad University, Tehran, Iran. So far, She has participated in several congresses and presented posters. She is interested in the field of genetics, personalized medicine, disease treatment and research work.

kimiae2019@gmail.com

Received: 12 February 2023 | **Accepted:** 19 February 2023 | **Published:** 05 May 2023