## **Oncolytic adenovirus**

Oncolytic adenovirus is a type of virus that has been engineered for use in oncolytic virotherapy, a novel and promising approach to cancer treatment. Here are key points about oncolytic adenovirus:

Adenovirus as a Vector:

Adenoviruses are a family of viruses that can cause respiratory and other infections in humans. In oncolytic virotherapy, certain adenoviruses are modified and used as vectors for therapeutic purposes. Selective Replication in Cancer Cells:

Oncolytic adenoviruses are designed to selectively replicate within cancer cells. Normal cells have mechanisms to prevent adenovirus replication, but these safeguards are often compromised in cancer cells, allowing the virus to specifically target and replicate within the tumor. Cell Lysis and Cancer Cell Destruction:

Upon replication, oncolytic adenoviruses cause the targeted cancer cells to undergo lysis, a process in which the cells rupture and release new viral particles. This leads to the destruction of the cancer cells and can potentially affect nearby tumor cells. Immune System Stimulation:

Oncolytic adenoviruses can stimulate the immune system. As infected cancer cells are destroyed, the release of tumor antigens and viral particles can trigger an immune response, which may further contribute to the elimination of cancer cells, including those outside the primary tumor site. Genetic Modifications for Safety and Efficacy:

The adenovirus vector is often genetically modified to enhance safety and efficacy. Modifications can include deleting specific viral genes to reduce virulence in normal cells and adding therapeutic genes to enhance the anti-cancer effect. Specificity for Different Cancers:

Various oncolytic adenoviruses are being developed for the treatment of different types of cancers. The choice of adenovirus type and modifications depends on factors such as the specific cancer type, the presence of receptors on cancer cells, and the overall treatment strategy. Combination with Standard Therapies:

Oncolytic adenoviruses can be used alone or in combination with other standard cancer treatments such as surgery, chemotherapy, and radiation therapy. Combinations may enhance the overall therapeutic effect. Clinical Trials and Research:

Numerous oncolytic adenoviruses are undergoing evaluation in preclinical studies and clinical trials. These trials aim to assess the safety, tolerability, and efficacy of oncolytic adenovirus-based treatments in human patients. Challenges and Considerations:

Challenges in oncolytic virotherapy include the potential development of resistance by cancer cells, addressing immune system responses, and optimizing delivery methods to enhance virus penetration into tumor tissues. Oncolytic adenovirus therapy is a rapidly evolving field with the potential to offer new treatment options for various types of cancer. Ongoing research aims to refine these therapies and expand their applicability across different cancer types.

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