Delta-24-RGD is an oncolytic adenovirus that has been investigated for its potential in cancer treatment, particularly in the context of gliomas. Here are some key points about Delta-24-RGD:

Adenovirus Vector:

Delta-24-RGD is based on an adenovirus vector. Adenoviruses are a type of virus that can cause respiratory and other infections in humans, but they have been engineered for use in oncolytic virotherapy. Oncolytic Properties:

The term “oncolytic” refers to the ability of the virus to selectively infect and destroy cancer cells. Delta-24-RGD is designed to replicate within cancer cells, leading to their destruction while sparing normal, healthy cells. RGD Modification:

The “RGD” in the name refers to the incorporation of the RGD (Arg-Gly-Asp) peptide sequence. This modification aims to enhance the virus's ability to target cancer cells, as RGD peptides can interact with integrins on the surface of cancer cells. Specificity for Gliomas:

Delta-24-RGD has been studied specifically for its effectiveness in targeting gliomas, which are aggressive and difficult-to-treat brain tumors. Glioma cells often express integrins, making them potential targets for viruses modified with the RGD peptide. Mechanism of Action:

After infecting glioma cells, Delta-24-RGD undergoes replication, leading to the release of new virus particles and the destruction of the host cancer cell. This process can amplify the therapeutic effect within the tumor. Clinical Trials:

Delta-24-RGD has been evaluated in preclinical studies and clinical trials to assess its safety, tolerability, and efficacy in patients with gliomas. Clinical trials help determine the potential of the virus as a treatment option. Immunogenicity and Neutralizing Antibodies:

Like many oncolytic viruses, Delta-24-RGD may elicit an immune response in patients. One challenge faced in clinical trials is the potential development of neutralizing antibodies by the immune system, which could limit the virus's effectiveness upon repeated administration. Future Developments:

Researchers are continually exploring ways to improve the oncolytic potential of Delta-24-RGD and address challenges such as the development of neutralizing antibodies. Strategies, such as creating modified versions of the virus, as mentioned in your previous query (Delta-24-RGD-H43m), aim to enhance its therapeutic capabilities. It's important to note that the field of oncolytic virotherapy is dynamic, and ongoing research contributes to our understanding of the strengths and limitations of viruses like Delta-24-RGD in cancer treatment. The safety and efficacy of such therapies are subjects of ongoing investigation in the scientific and medical communities.

Data from a previous clinical trial using the oncolytic adenovirus Delta-24-RGD showed that generation of anti-viral neutralizing antibodies may affect the long-term survival of glioma patients. Past studies have examined the effects of neutralizing antibodies during systemic virus injections but largely overlooked their impact during local virus injections into the brain. We found that immunoglobulins colocalized with viral proteins upon local oncolytic virotherapy of brain tumors, warranting a strategy to prevent virus neutralization and maximize oncolysis. Thus, we generated a chimeric virus, Delta-24-RGD-H43m, by replacing the capsid protein hexon hypervariable regions from the serotype 5-based Delta-24-RGD with those from the rare serotype 43. Delta-24-RGD-H43m evaded neutralizing anti-adenovirus serotype 5 antibodies and conferred a higher rate of long-term

survival than Delta-24-RGD in glioma-bearing mice. Importantly, Delta-24-RGD-H43m activity was significantly more resistant to neutralizing antibodies present in sera of glioma patients treated with Delta-24-RGD during a phase 1 clinical trial. These findings provide a framework for a novel treatment of glioma patients that have developed immunity against Delta-24-RGD [1)]

1)
Shin DH, Jiang H, Gillard A, Kim D, Fan X, Singh S, Nguyen TT, Sohoni S, Lopez-Rivas A, Parthasarathy A, Ene CI, Gumin J, Lang F, Alonso MM, Gomez-Manzano C, Fueyo J. Chimeric oncolytic adenovirus evades neutralizing antibodies from human patients and exhibits enhanced anti-glioma efficacy in immunized mice. Mol Ther. 2024 Feb 3:S1525-0016(24)00035-2. doi: 10.1016/j.ymthe.2024.01.035. Epub ahead of print. PMID: 38311852.