Next-Generation Oncolytic Viruses: Novel Recombinant Replication Competent Agents for Cancer Virotherapy

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Technology description

Scientists at Rutgers University have designed a variety of improved fusogenic recombinant NDV variants using computational tools and hydropathic scaling techniques culled from previous experience with studying compacted networks, and applied them to oncolytic virus applications. Using in silico modeling techniques to evaluate and alter protein structures and protein-encoding sequences for the glycosidic proteins on the NDV strains, the potential in vivo availability, stability and oncolytic activity of the strains, is predicted to be enhanced. Such modified viruses may be administered for therapeutic effects using a variety of carriers. Conceptually, such treatments may be used alone or in conjunction with other agents to achieve the desired anti-neoplastic results.

Oncolytic viruses selectively target cancer cells, replicating within them and eventually triggering tumor cell lysis, without affecting normal cells. But the optimal use of these anti-neoplastic viruses has not yet been realized. Newcastle Disease Virus (NDV) is a single-stranded RNA virus and its variants have been studied and considered for potential anti-cancer treatment, but with limited success. Scientists at Rutgers University have designed a variety of improved fusogenic recombinant NDV variants using computational tools and hydropathic scaling techniques culled from previous experience with studying compacted networks, and applied them to oncolytic virus applications. Using in silico modeling techniques to evaluate and alter protein structures and protein-encoding sequences for the glycosidic proteins on the NDV strains, the potential in vivo availability, stability and oncolytic activity of the strains, is predicted to be enhanced. Such modified viruses may be administered for therapeutic effects using a variety of carriers. Conceptually, such treatments may be used alone or in conjunction with other agents to achieve the desired anti-neoplastic results.

In summary, this technology may improve viral vaccine compositions to easily and reliably treat/regress solid primary tumors and secondary metastases, in patients where conventional treatments have failed.

Institution

Rutgers University

Inventors

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