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Neural Stem Cells-expressing CRAd-S-pk7

National Cancer Institute

Source

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Neural stem cells (NSCs) that are transfected with the gliomatropic oncolytic adenovirus (OV) CRAd-S-pk7, a conditionally replicative oncolytic adenoviral (CRAd) vector that contains the tumor-specific survivin promoter (S) and a fiber protein polylysine modification (pk7), with potential antineoplastic activity. Upon intracerebral administration of NSC loaded with CRAd-S-pk7, the NSCs preferentially migrate towards tumor cells, and the polylysine moiety of the modified fiber protein expressed by the viral vector specifically targets and binds to tumor-specific heparan sulfate proteoglycans. Subsequently, the virus can infect the tumor cells and viral replication is initiated because E1 gene expression is controlled by the tumor-specific promoter for survivin. This results in the specific lysis of the glioma cells. The pk7 fiber modification and the survivin promoter enable tumor-specific infectivity, and transcriptional targeting and preferential replication in glioma cells, while sparing the surrounding normal brain parenchyma. The pk7 is comprised of a heparan sulfate binding domain incorporated into the fiber protein of the adenovirus.