TG7010: a Novel Chimeric Oncolytic Poxvirus Expressing IL-12 with Improved Properties for Systemic Delivery

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Oncolytic virotherapy has emerged as a novel cancer therapeutic approach with the potential to be more effective and less toxic than current therapies due to the selective growth and amplification of the virus in tumor cells. Various types of oncolytic viruses (OVs) in clinical development, including Vaccinia virus-derived OVs, have shown good safety profiles, but have generally failed to achieve the expected therapeutic value as monotherapies. Consequently, new approaches to generate powerful oncolytic viruses are needed. We used a new directed evolution process, pooling several orthopoxvirus species to create a highly potent oncolytic chimeric poxvirus, named PoxSTG.

Compared with classical oncolytic vaccinia virus, PoxSTG demonstrates superior tumor lytic capacity, higher dissemination into the tumors, and more resistance to humoral immunity. Armed with IL-12, a pleiotropic and potent cytokine involved in the activation of natural killer and T cells, PoxSTG-IL12, named TG7010, showed potent antitumor effects in several syngeneic and xenograft mouse models. Furthermore, TG7010 exerted low-dose antitumor effects in virus-injected and non-virus-injected distant tumors in a CRC xenograft model, demonstrating strong virus spread to distant tumors.

All these data demonstrate the potential of TG7010 as a novel therapeutic agent for cancer treatment.