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A novel oncolytic HSV-1 vector for cancer immunotherapy

Oncolytic virotherapy has attracted increasing attention as one modality of cancer immunotherapy, especially after FDA approval of T-VEC, the first oncolytic virus (OV) drug in North America. It is now widely accepted that OV induced tumor regression is multi-mechanistic and host immune reaction plays a pivotal role. In the present study, we reported a novel oncolytic HSV-1 virus VG161 that carries three immune stimulating factors: IL12, IL15 with its receptor alpha unit and a PDL-1 blocking peptide. We have shown that this virus expresses the three major factors in infected cancer cells and shown enhanced immune cell cytotoxicity in vitro when co-cultured with PBMC. We also showed that VG161 caused stable and complete tumor regression in both syngeneic mouse tumor and human tumor in nude mouse models. The same tumor failed to grow in previously treated animals. Transcriptional profiling of the tumors treated with VG161 demonstrated a dramatically changed immune microenvironment in the tumor compared to infection with a similar virus VG160 that does not carry the anti-tumor immune stimulating factors. The above results suggest that co-expressing multiple factors by an OV can have enhanced and durable anti-tumor efficacy.

Biography

William Jia has completed his PhD in 1991 at University of British Columbia (UBC) in Molecular Neurosciences. He has been an Associate Professor since 1999 at UBC and an Associate Scientist of BC Cancer Research Centre. He has been a Conjunct Professor of Fudan University, Shanghai Institute of Pharmaceutical Industry and the VP (research) for Shanghai Innovative Research Centre of Traditional Chinese Medicine (SIRC-TCM). He was the first in Canada and the first few scientists in the world using human Herpes simplex virus to treat cancer, which pioneered the field of oncolytic virotherapy for cancer treatment. He has developed one gene therapy drug for malignant gliomas has completed a phase I clinical trial in China. His most recent contribution is to raise the concept of transcription and translation dual regulated (TTDR) oncolytic viruses for cancer treatment. In the past years, he has received many awards and research funds. Since 1997, he has been a Scholar of Canadian Institute of Health Research. He has also received Petro Canada Young Inventors Award in 2007.

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