Book Review: Viral Therapy of Human Cancers
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The editors pose the following question: “Could viruses contribute to the cure of cancer?”

“Viral Therapy of Human Cancer” is a summary of investigations and of scientific thought driving the biotherapeutics of cancer. It is an exceptional collection of data on viral oncolysis, molecular virology, basic tumor cell biology, and viral-cellular interactions. It presents experimental results ranging from tissue culture studies to Phase I and II clinical trials.

The authors are well-known virologists, medical oncologists, and developers of viral therapy who provide an authoritative and fully documented text. Of the 13 chapters, the first 2 are by J.G. Sinkovics. The author begins with a personal narrative, telling of historical experiments of tumor cell–lymphocyte interactions that clarified the role of NK cells, immune T-cells, and dendritic cells before their current nomenclature was assigned. He then proceeds to characterize natural oncolytic viruses, including Influenza-, Newcastle disease-(NDV), Measles-, Vesicular Stomatitis- (VSV), Herpes- (HSV), Reo-, Vaccinia-, and Adenoviruses. New strains of these viruses created by genetic engineering are designed to attack tumors selectively or to insert genes into the genome of tumor cells. These may be tumor suppressor or cytokine genes, genes of immunologic co-stimulators, or genes that trigger apoptosis. Viral vectors can deliver antisense oligonucleotides that antagonize the replication of genomic sequences of oncogenes, and of genes that promote neovascularization. Viral oncolysates (VO) were introduced to clinical testing in 1971. Vaccines were prepared from autologous or allogeneic tumor cultures lysed by PR8 Influenza or 73T NDV. Melanoma patients vaccinated in addition to standard treatment have shown survival advantages. VO vaccines proved highly immunogenic. Budding virions provoked an immediate reaction by NK cells. Later a memory cell directed immune T-cell reaction with release of lymphokines (eg, TNFα) led to apoptosis of tumor cells and post oncolytic immunity.

The second chapter reviews the new biological therapeutics and how virotherapy may be integrated with them. In an encyclopedic survey, the author summarizes much of molecular biology of normal and transformed cells and the targets they present for viral therapy. He reviews recent experience with monoclonal antibodies, immunotoxins, and cancer vaccines and the role of adaptive immune lymphocytes in cancer therapy. The amount of information on the molecular level that is condensed in this chapter is exceptional. However, a number of errors escaped proof-reading (not so much in the text as in the index).

In the following chapters, J.C. Horvath and the invited contributors present their groups’ experimental and clinical results or introduce new concepts for the enhancement of long-term survival. V. Schirrmacher discusses stimulation of pre-existing anti-tumor memory T-cells from cancer patients that could improve survival. C. Springfield describes the molecular biology and reverse genetics of the measles virus as a way to improve its oncolytic properties. J.C. Horvath reports experiments with NDV oncolysates as adjuvant tumor vaccine, and W.A. Cassel presents his long-term clinical study showing the remarkable 20-28 yr melanoma-free
survival of Stage III malignant melanoma patients managed with NDV oncolysates. M. Berman discusses Influenza A virus with deletion in the NS1 gene. The virus replicates in tumor cells but not in interferon-competent normal tissues. R. A.C. Taylor reviews the oncolytic activity of VSV dependent on defects in the IFN signaling pathway. J. Rommelaere evaluates engineered parvo-viruses as potential anti-cancer agents with improved efficiency, and targeting. X. Fu reports on fusogenic HSV that incorporates syncytia-forming capability into oncolytic HSVs so that the virus could kill tumor cells by two complementary mechanisms, direct cytolysis and membrane fusion. M. Merrill presents work on a prototype oncolytic poliovirus recombinant for use against CNS malignancies. F. McCormick writes of his work with oncolytic agents that depend for replication on cellular loss of the tumor suppressor RB gene or of p53. One construct that selectively kills cancer cells is ONYX-015.

This multi-authored volume is well written and is fully documented with an extensive bibliography. The text is complemented by illustrations and tables listing therapeutic targets and their molecular inhibitors. The volume should be of considerable value to investigators, indispensable to medical oncologists, and of interest to clinical scientists.

Viruses can indeed contribute to the cure of cancer!