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Tumor-specific Anergy vs Global immunosuppression in immunity to brain tumors

Valentin Shichkin^{1,2} and Dmitry
Krasnenkov²

¹University Ukraine, Ukraine

²Taras Shevchenko National University of Kyiv,
Ukraine

Induction of immune response to brain tumors is limited by blood brain barrier that bounds access of naïve T cells to the brain as well as failure of brain environment to activate infiltrating T cells inducing the state of anergy. Anergic T cells are neither deleted nor altered with regard to levels of TCR and co-receptor molecules, but are refractory to the recalling antigenic stimulus. A number of studies also support the hypothesis that tumors evade immunological rejection inducing regulatory CD4⁺CD25⁺ T cells and state of global immunosuppression producing TGF- β , IL-10, PG-E2 et al. In this study, mouse B-cell lymphoma engineered to express hemagglutinin (HA) antigen was used as a brain tumor model in which HA-specific CD4⁺ T cells transferred to syngeneic recipients were monitored during the brain tumor progression. T cells demonstrated the activation already on day 2 after the adoptive transfer and became anergic to day 16. Signs of systemic immunosuppression were observed in mice with massive brain tumors and sick symptoms at the late stage of the brain tumor progression. The process is accompanied by very fast reduction of spleen and lymph nodes in symptomatic mice assuming the metabolic stress and corticosteroid emission that dramatically damages the lymphoid organs. However, even at the late stage there still are remaining the tumor-specific T-cells that can be restimulated *in vitro* with HA antigen. Thus, our data suggest at the reasonable conditions the immune response against advanced brain tumors may be reversible at least for some high-resistant CD4⁺ T cells.

Biography

Prof. Shichkin has got his MS (1981) in Biology from Nizhny Novgorod State University (Russia), PhD (1986) and DSc (1991) in Immunology from Institute of Immunology (Moscow). He then improved his expertise in Immunology in the USA (1998-2003) at the National Cancer Institute – NIH, University of Cincinnati and John Hopkins University. He held academic research positions as a Senior Scientist, Principal Scientist and Laboratory Chief. He is now a professor of Immunology at the University “Ukraine” and Taras Shevchenko National University in Kyiv (Ukraine). He is author more 80 publications in fields of immunobiology, hybridoma technology and cancer immunology.