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Bioengineered Fusokine GIFT4 for cancer immunotherapy

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Emerging evidences show immunotherapy by enhancing our own immune system has become an attractive approach for cancer treatment due to the rapid drug resistance of chemotherapy. Fusion cytokines derived from GM-CSF and common γ -chain interleukins have potent gain-of-function properties to alter host immune response. Recently, we have generated a newly bioengineered fusokine GIFT4 that is derived from GM-CSF and IL-4, and tested the bioactivity of GIFT4 as a potential immunotherapeutic agent against cancer. We observed that GIFT4 directly elicits anti-tumor adaptive B-cell immune response and consequent T cell immunity *in vitro* and *in vivo*. Murine GIFT4 expression suppresses melanoma tumor growth in immunologically intact mouse and administration of GIFT4 protein inhibits murine melanoma growth *in vivo*. GIFT4-B cell primed cytotoxic T cells from melanoma patients specifically kill human melanoma cells *in vitro* and in immune deficient NSG mice. Thus, GIFT4 defines a novel engineered cytokine that mediates endogenous expansion of B-cells with potent anti-tumor effector function. We propose that GIFT4 protein could serve as a novel immunotherapeutic agent and defines a previously unrecognized potential of B-cells for personalized cancer cell immunotherapy. We expect that GIFT4 as an anti-melanoma agent will provide a novel strategy and opens a new avenue for human B cell-based immunotherapy against melanoma. We propose that GIFT4-B cells could serve as a potent immunotherapeutic agent and define a previously unrecognized potential of B-cells for personalized cancer cell immunotherapy.

Biography

Deng received his PhD from Tel Aviv University School of Medicine in Israel in 2005. He completed his postdoc training in Massachusetts General Hospital Harvard Medical School and Emory University. He worked as a Research Associate in Stanford University School of Medicine. In 2011, Dr. Deng became an Instructor of Hematology and Medical Oncology in Winship Cancer Institute at Emory University. He has authored a number of peer-reviewed publications in the elite journals such as *Cancer Research*, *Circulation*, and *Nature Immunology*.

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