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Immuno-targeting ENO1 as a novel strategy for cancer therapy

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Alpha-Enolase (α-ENO; ENO1) is a catalytic enzyme participating in the penultimate step of glycolysis and also poses several non-metabolic functions such as plasminogen-binding. In previous studies, we showed that the statuses of cytosolic and cell-surface ENO1 expression were positively associated with the disease progression and metastatic potential of patients with non-small cell lung cancer (NSCLC) and pancreatic cancers. However, the immune response against ENO1 is reversely correlated with the disease stage of NSCLC patients. Using the ENO1 cancer vaccines in the presence or absence of a novel adjuvant, PELC, to re-build the immune responses, both preventive and therapeutic mouse experiments all showed a remarkable suppression on tumor growth and blockade of lung metastatic colony formation. The anticancer event is merely dependent on an antigen-specific manner. The killing effect is mainly attributed to activation of $CD3^+CD8^+$ T lymphocytes, and partially contributed by antibody-mediated cytotoxicity. However, compared to the absence of PELC adjuvant, the presence of PELC in the ENO1 vaccine significantly provided a better therapeutic and survival benefit in any preclinical mouse model. On the other hand, tumor-bearing mice were administrated with monoclonal ENO1 antibody plus activated complements also demonstrated a dramatic tumor suppression and inhibition of tumor metastasis. Collectively, ENO1 can be a potential good and safe target for MHC-I-dependent cancer immunotherapy when using PELC adjuvant. In addition, cell-surface ENO1 may also provide a great opportunity for an effective antibody therapy in the near future.

Biography

Neng-Yao Shih received his Ph.D. (1996) in molecular and cell biology from the Arizona State University, and followed by a post-doctoral training in the Medical School of Washington University in St. Louis (1997-2000), studying the role of CD2-associated protein in T cell activation. In 2001, he started to develop his scientific career in the National Health Research Institutes, where he is a pioneer on identification of immunogenic tumor-associated antigens (TAAs) from lung cancer patients. In his previous studies, he demonstrated that immune-targeting to those TAAs could significantly provide a better survival benefit on cancer prevention and therapy.

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