Cytokine-induced killer cells: a novel treatment for allergic airway inflammation

Kitipong Soontrapa, Panwadee Pluangnooch, Sunita Timalsena, Adisak Wongkajornsilp

Pharmacology, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

Cytokine-induced killer (CIK) cells, a widely studied cell-based immunotherapy for cancer treatment, are generated ex vivo by culturing peripheral blood mononuclear cells with the timely addition of interferon gamma (IFN-g), monoclonal antibody against CD3 (anti-CD3) and interleukin-2 (IL-2) for 3-4 weeks, and their major effector cells are identified as CD1d independent CD8+ NKT cells expressing CD3+ CD8+ CD56+ (for murine CIK cells: CD3+ CD8+ NK1.1+). Due to high productions of Th1 cytokine (IFN-g) and cytolytic granules (perforin and granzymes) in a non-major histocompatibility complex (MHC)-restricted manner, the effectiveness of CIK cells for treatment of cancers has long been appreciated. Here, based on the mouse model of ovalbumin-induced allergic airway inflammation, we report for the first time that CIK cells can be applied to treat allergic airway inflammation. Treatment with CIK cells could significantly reduce lung inflammation as evidenced by reductions in all of important parameters of allergic airway inflammation, bronchoalveolar lavage cellularity, T helper type2 cytokine levels and lung histology, without any obvious adverse effects. Interestingly, the observed effects were comparable to those treated with dexamethasone. We hope that our novel therapeutic approach using CIK cells to treat allergic airway inflammation will be beneficial especially for patients with severe asthma in the future.