

Understanding host defense system and its application to drug discovery

Yoshihiro Hayakawa*

Section of Host Defences, Institute of Natural Medicine, University of Toyama, Sugitani 2630, Toyama,
JAPAN

*E-mail address of the corresponding author: haya@inm.u-toyama.ac.jp

The host defense system is a multifaceted immune system of unique, yet highly integrated, responses to potentially harmful antigens, infections or mutated cells, such as cancer cells. The immune system is composed of an innate and an adaptive response, and innate immunity is constitutively present and is mobilized immediately following invasion of non-self- antigens. In this context, our Lab studies the control of immunological diseases focusing on innate immune cells, particularly the biology of natural killer (NK) cells and their importance in the control of cancer progression and metastasis. In clinic, an inverse correlation between the levels of circulating or tumor-infiltrating NK cells and the metastatic spread in several types of cancer patients has been reported. Anti-tumor activity of NK cell is mainly induced by the activation receptors, whereas the counter negative signal by recognizing self MHC molecules or other self-related molecules dampens such activation signal. NK cells control tumor metastasis through its granule-mediated or death ligand-induced cytotoxicity, along with the production of anti-tumor cytokine IFN- γ . While the subsets of NK cell display diversities in their function and tissue distribution, there is no clear evidence whether circulating/infiltrating NK cells and/or tissue-resident NK cells play a dominant role in controlling tumor growth and metastasis. In this presentation, I would like to share the current understanding and our recent efforts on how NK cells control tumor growth, progression and distant metastasis.

Keywords (5 keywords): host immunity; NK cell; cancer; metastasis; cytokine