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NUS, Blk MD4
Level 2 Seminar
Room @ 5 Science
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The Antiviral And Antitumor Characteristics Of Human $\gamma\delta$ -T Cells



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Abstract

$\gamma\delta$ -T cells represent for a small population of immune cells, but play indispensable role in host defense against exogenous pathogen, immune surveillance on endogenous pathogenesis and even homeostasis of immune system. The activation and expansion of $\gamma\delta$ -T cells are generally observed in diverse human diseases and correlate with the progress and prognosis of diseases. $\gamma\delta$ -T cells have both “innate” and “adaptive” like characteristics in immune responses, and their antiviral and antitumor activities can be carried out by multiple pathways that are under elaborate regulation by other immune components. Recently, we found that human V γ 9V δ 2-T cells expanded by the aminobisphosphonate pamidronate can kill influenza virus-infected cells and inhibit the replication of various influenza viruses, including human and avian seasonal and pandemic influenza viruses. The cytotoxicity of V γ 9V δ 2-T cells against influenza virus-infected cells was dependent on NKG2D activation, and mediated by Fas-FasL and perforin-granzyme B pathways. More recently, we also showed that pamidronate-expanded human V γ 9V δ 2-T cells can efficiently kill EBV-transformed autologous lymphoblastoid B cell tumor lines through γ/δ -TCR and NKG2D receptor triggering, and Fas and TRAIL engagement. Using humanized mouse model, we further demonstrated that targeted activation of human V γ 9V δ 2-T cells can control influenza diseases and EBV-induced lymphoproliferative disease by using pamidronate to selectively enhance human $\gamma\delta$ -T cell immunity. As pamidronate has been already used for decades in osteoporosis treatment, this ‘new application of an old drug’ potentially offers a safe and readily available option for the treatment of influenza virus infection and EBV-induced tumors.

RECOMMENDED READING

Tu W* and Zheng J. Chapter 10. Application of Humanized Mice in Immunological Research . In: Maria Cristina Cuturi and Ignacio Anegón (eds.), Suppression and Regulation of Immune Responses : Methods and Protocols, Volume II, Methods in Molecular Biology , 2016

Chen Q , Wen K, Lv A, Liu M, Ni K, Xiang Z, Liu Tu W*. Human V γ 9V δ 2 T cells synergize CD4 Tfh cells to produce influenza virus specific antibody . Frontiers in Immunology 2018

Xiang Z and Tu W*. Dual face of V γ 9V δ 2-T cells in tumor immunology: anti- versus pro-tumoral activities, Frontiers in Immunology, 2017

Liu Y, Zheng J, Liu Y, Wen L, Huang L, Xiang Z, Lam KT, Lv A, Mao H, Lau YL, Tu W*. Uncompromised NK cell activation is essential for virus-specific CTL activity during acute influenza virus infection. Cell Mol Immunol. 2017