



**THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY**  
**Division of Life Science**

**Discovery of a novel immune pathway with  
implications to HIV/AIDS and cancer immunotherapy**

by

**Prof. Zhiwei Chen**

*The founding director of the AIDS Institute  
The University of Hong Kong*

**Abstract**

The innate immune cells underlying mucosal inflammatory responses and damage during acute HIV-1 infection remain incompletely understood. Here, we report a V $\delta$ 2 subset of gut-homing  $\gamma\delta$ -T cells with significantly upregulated  $\Delta$ 42PD1 (a PD1 isoform) in acute (~20%) HIV-1 patients compared to chronic HIV-1 patients (~11%) and healthy controls (~2%). The frequency of  $\Delta$ 42PD1<sup>+</sup>V $\delta$ 2 cells correlates positively with plasma levels of pro-inflammatory cytokines and fatty acid binding protein before detectable lipopolysaccharide in acute patients. The expression of  $\Delta$ 42PD1 can be induced by in vitro HIV-1 infection and is accompanied by high co-expression of gut-homing receptors CCR9/CD103. To investigate the role of  $\Delta$ 42PD1<sup>+</sup>V $\delta$ 2 cells in vivo, they were adoptively transferred into autologous humanized mice, resulting in small intestinal inflammatory damage, probably due to the interaction of  $\Delta$ 42PD1 with its cognate receptor TLR4. In addition, blockade of  $\Delta$ 42PD1 or TLR4 successfully reduced the cytokine effect induced by  $\Delta$ 42PD1<sup>+</sup>V $\delta$ 2 cells in vitro, as well as the mucosal pathological effect in humanized mice. Our findings have therefore uncovered a  $\Delta$ 42PD1/TLR4 pathway exhibited by virus-induced gut-homing V $\delta$ 2 cells that may contribute to innate immune activation and intestinal pathogenesis during acute HIV-1 infection.  $\Delta$ 42PD1<sup>+</sup>V $\delta$ 2 cells may serve as a target for the investigation of diseases with mucosal inflammation.

**Biography:**

*Dr. Zhiwei Chen is the founding director of the AIDS Institute at The University of Hong Kong. He graduated from the Aaron Diamond AIDS Research Center of the Rockefeller University, and obtained his Ph.D. degree from New York University School of Medicine in 1996. He is currently a tenured full professor in Microbiology with great interests in HIV vaccine and cure research as well as immunotherapy against cancer.*

*He has published over 100 SCI papers and received numerous research grants as a PI from NIH32, amFAR, NIHR01, Gates Foundation in US; RGC, HMRF and ITF in Hong Kong, as well as a project leader of 973, 11th- and 12th-Mega grants in Mainland China. He serves as an editorial board member for AIDS, JAIDS, and JNIP, and the only researcher from China in generating the "International AIDS Society global scientific strategy: towards an HIV cure 2016" (Nat Med 2016). He will present his discovery on a novel immune regulatory pathway, which has just been published in Nature Microbiology in October 2017.*



**Date : 4 October 2017 (Wednesday)**

**Time : 10:30 a.m. – 11:30 a.m.**

**Venue : Lecture Theater C**

(Host faculty: Prof. Ning Li)

***All are Welcome!!***