Born A Killer: Preconfiguration Of Chromatin Landscapes Dictates Virus-Specific CD8+ T Cell Differentiation

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Abstract
Infection triggers large-scale changes in the phenotype and function of virus-specific CD8+ T cells that are critical for immune clearance, yet the gene regulatory mechanisms that control these changes are largely unknown. Genome wide mapping of chromatin interactions (HiC), histone PTMs (ChIP-seq) and chromatin accessibility (ATAC-seq) demonstrated that chromatin structures within naïve CD8+ T cells are pre-configured at both the level of histone PTMs and higher order chromatin contacts. This genomic pre-configuration is associated with targeted epigenetic maturation of lineage-specific genomic elements upon T cell activation, thus implying that the outcome of CD8+ T cell differentiation is largely pre-determined. These data have implications better understanding of the molecular events, and their regulation, that occur during the generation of effective T cell responses and establishment of immunological memory.

About our speaker
Professor Stephen Turner is currently a NHMRC Principal Research Fellow and Head of the Department of Microbiology, Monash University. He was awarded his PhD in Viral Immunology from Monash University in 1997. He completed postdoctoral training with Dr Janet Ruby (University of Melbourne) studying pox viral pathogenesis, and then with Nobel Laureate, Professor Peter Doherty (St Jude Children’s Research Hospital, USA) studying influenza virus-specific T cell immunity. He returned to the University of Melbourne in 2002. He was awarded an NHMRC RD Wright Fellowship in 2005 establishing his own research group. This was followed with awarding of a Pfizer Australia Senior Research Fellowship in 2007, an ARC Future Fellowship in 2012, and is currently CIA on an NHMRC program grant that focuses on T cell immunity to influenza. His research interests utilize a combination of structural biology, genomics, systems biology, recombinant viral technology and cellular immunology to examine molecular factors that impact T cell responses to virus infection.