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SIgN Immunology Seminar

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Asymmetric T Lymphocyte Division and the Diversification of Adaptive Immunity

Host
Dr Evan Newell
Singapore Immunology Network, A*Star

Date
Tuesday
7 October 2014

Time
2pm – 3pm

Venue
SIgN Seminar Room
Immunos Building
Level 4
Biopolis

T lymphocytes responding to microbial infection give rise to effector cells that mediate acute host defense and memory cells that provide long-lived immunity, but the fundamental question of when and how these cells arise remains unresolved. We have previously shown that $CD8^+$ T lymphocytes can undergo asymmetric division, potentially enabling lymphocyte fates to diverge early during an immune response owing to unequal inheritance of certain determinants, such as the receptor for interferon-γαμμα and the transcription factor T-bet. We have recently undertaken single-cell gene expression analyses to trace the transcriptional roadmap of individual $CD8^+$ T lymphocytes throughout the course of an immune response *in vivo*. Gene expression signatures predictive of eventual fates could be discerned as early as the first T lymphocyte division and may have been influenced by asymmetric partitioning of the receptor for interleukin 2 during mitosis. These findings emphasize the importance of single-cell analyses in understanding fate determination and provide new insights into the specification of divergent lymphocyte fates early during an immune response to microbial infection.