Department of Biomedical Sciences

presents a seminar

"Identifying consequential microRNAs and their targets in CD8+ T cells"

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Date : 29 August 2017
Time: 2:30pm to 4:00pm
Venue: Meeting Room 2-130, 1/F, Block 2, To Yuen Building

Abstract

Although microRNAs (miRNAs) contribute to essentially all mammalian gene regulatory pathways, the identification of consequential miRNAs active in a given cell-type remains challenging. To address this challenge, mRNA and miRNA transcriptome profiles can be used to infer the identities of miRNAs with regulatory impacts. We used such approaches to discover miRNAs that might underlie age-dependent differences in CD8+ T cells, which protect organisms from intracellular diseases. In early life, mice and other mammals are deficient at generating memory CD8+ T cells, which protect from re-infection; we hypothesized that age-specific activities of one or more miRNAs underlie these differences. We profiled mouse transcriptomes from CD8+ T cells at different stages of infection, comparing adult and neonatal profiles. Adult and neonatal miRNA profiles were surprisingly similar in effector cell populations created during infection; however, we observed large differences prior to infection; in particular, miR-29 and miR-130 exhibit significant differential expression between adult and neonatal naive cells. Importantly, we detected reciprocal changes in expression of mRNA targets for both miRNAs; moreover, targets include Eomes and Tbx21, key genes that regulate memory CD8+ T cell formation. In addition, the mRNA profiles of neonatal naive cells already resemble those of effector cells. Changes in miR-29 and miR-130 and their targets are conserved in human CD8+ T cells, and in other T cell lineages. Together, these results suggest that miR-29 and miR-130 are important regulators of memory CD8+ T cell formation, and that neonatal cells are committed to a short-lived effector cell fate prior to infection.

About the Speaker

Andrew Grimson is an Associate Professor in the Department of Molecular Biology & Genetics. Dr. Grimson is a member of the Graduate Field of Biochemistry, Molecular and Cell Biology and the Graduate Field of Genetics, Genomics and Development. The Grimson lab focuses on post-transcriptional gene regulation, in particular the identity and function of animal microRNAs and other small RNAs.

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All are welcome!