Genetics and Genomics (G2) Seminar Series

INSTITUTE FOR GENOME SCIENCES AND SOCIETY
TEXAS A&M UNIVERSITY

The Interdisciplinary Faculty of Genetics
Genetics Graduate Student Association

Epi-Evo: insights into epigenetic mechanism from evolutionary analyses

Dr. Peter Sarkies

MRC London Institute of Medical Sciences, Imperial College London

Epigenetic gene regulation is central to eukaryotic biology. Nevertheless, epigenetic gene regulation shows a surprising diversity, such that many pathways that are essential in mammals have been lost altogether several times independently across metazoans. Intriguingly, these epigenetic pathways also show considerable variation in human cancer, including frequent inactivating mutations. We are using comparative epigenomics across metazoans to understand the factors driving diversity of epigenetic regulation, and hence gain insight into its role in cancer development. Here I will present our recent study of cytosine DNA methylation, an ancient epigenetic modification which has none-the-less been lost altogether in many eukaryotic lineages. We discovered coevolution between DNA methylation and a specific DNA repair pathway, and using mechanistic analyses in mammals explained this by demonstrating that DNA methyltransferases have a toxic side-reaction that damages DNA. This may help to explain both the loss of DNA methylation in many species and the frequent observation of hypomethylation in cancer.

Monday, November 6, 2017

4:00 p.m.

Auditorium/Room 108

BioBio Building

Refreshments at 3:30 p.m. in the lobby.

Host: Dr. Vaishali Katju
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Genetics

Texas A&M Institute for Genome Sciences and Society (TIGSS)

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