

# SEMINAR

Department of Biological Sciences



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**Hosted by Professor Ding Jeak Ling**



## What can we learn from our genomes?

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The finishing of the human genome sequence showed that raw genomic sequences would not be medically useful. Annotation of the genome sequence is necessary to make personal genome sequencing relevant to human health. A better understanding of human genetics and epigenetics will help us better understand diseases, such as cancer, which occurs due to genetic or epigenetic mutations. Recently, tremendous advances in DNA sequencing throughput, speed, and cost have been made in so-called “next-generation” sequencing. Using these approaches, I and others have helped to develop and refine ultra-high-throughput, genome-wide methods for annotation of genomic elements for functional characterization of the human genome, such as ChIA-PET for identifying chromatin interactions, Apoptoseq for discovering apoptotic DNA breakpoints, and RNA-PET for transcriptome characterization. Our applications of these methods have revealed many interesting features of the human genome, for example, the growing realization that that non-coding regions contain a plethora of functional genomic elements.

### **About Speaker**

Dr. Melissa J. Fullwood completed her undergraduate degree in Biological Sciences in 2005 at Stanford University, with honors, distinction and Phi Beta Kappa. She completed her PhD with the National University of Singapore Graduate School for Integrative Sciences and Engineering (NGS) in 2009, at the Genome Technology and Biology lab of the Genome Institute of Singapore with Dr Ruan Yijun as her PhD supervisor. She has first-authored or co-first-authored research papers and reviews in *Nature*, *Genome Research*, *Genome Biology*, *Nucleic Acids Research*, *PLoS ONE* and *Journal of Cellular Biochemistry*, as well as a protocol in *Current Protocols in Molecular Biology*. She is a recipient of an Agency for Science, Technology and Research (A\*STAR) National Science Scholarship, and one of three recipients of the inaugural L’Oreal-UNESCO for Women in Science National Fellowships in Singapore in 2009. Her PhD work won the “International” regional award in the GE and Science Prize for Young Life Scientists, which involved a trip to Sweden to receive the prize in the same hotel where the Nobel Prize used to be awarded. She is currently a Lee Kuan Yew Post-doctoral Fellow in the Duke-NUS Graduate Medical School under the mentorship of Professor Shirish Shenolikar, in collaboration with the Genome Institute of Singapore where she is an adjunct post-doctoral fellow. She is also an adjunct research fellow with the department of Biochemistry in the National University of Singapore, and serves on the council of the Singapore Institute of Biology.