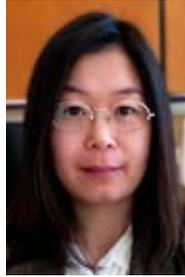




Department of Biomathematics Seminar Series:
Frontiers in Systems and Integrative Biology

Genome-Based HIV-1 Incidence Assay with High Sensitivity and Specificity



Ha Youn Lee, Ph.D.
Associate Professor
Dept. of Molecular Microbiology
and Immunology
University of Southern California

**Thursday, May 17, 2012
4:00 PM**

23-105 Center for the Health Sciences (CHS)

ABSTRACT:

To assess how many people have been recently infected in a given area is an important task in HIV-1/AIDS prevention. Accurately classifying recent or incident infections (e.g. within around the first year since transmission) from chronic infections enables one to track the epidemics, evaluate the impact of antiretroviral treatment, and assess the efficacy of HIV-1 prevention trials including vaccination, microbicides, and other types of interventions. Conventional serological testing is found to have a number of critical limitations which result in notable inaccuracy. In this talk, we turn to utilizing recent advances in understanding early HIV-1 infections and demonstrate that information derived from a set of HIV-1 envelope gene sequences obtained from a single blood sample can accurately distinguish incident infections from chronic ones. By analyzing previously published 5596 full envelope HIV-1 genes from 182 incident and 43 chronic subjects, we find that every incident case displays a robust signature, the presence of closely related strains, regardless of either single-variant or multi-variant transmission. We demonstrate that the sequence similarity used as a biomarker has high specificity and sensitivity over 95% and is not sensitive to viral and host specific factors including the clade of the viral strain, viral load, and the length and location of sequences in the HIV-1 envelope gene. The potency and accuracy of our sequencing-based HIV incidence assay is unprecedented and the assay holds great promise as a means of assessing the level of HIV-1 incidence from a single blood draw in cross-sectional blood surveys.

Host: Van Savage, Ph.D.

To receive e-mail seminar notices, contact David Tomita (dtomita@biomath.ucla.edu)

BIO
MATH