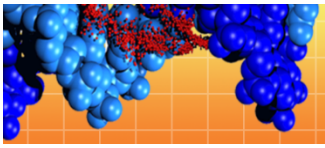

CENTER FOR BIOINFORMATICS & COMPUTATIONAL BIOLOGY

**BIOINFORMATICS 2015 SPRING SEMINAR SERIES**

Hosted by: Department of Computer and Information Sciences,
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Center for Bioinformatics and Computational Biology
http://bioinformatics.udel.edu/seminars

**MONDAY, March 9, 2015**
**3:30pm**
**DBI Room 102**

# Mathematical Modeling Tools for HIV Cure Strategies


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**ABSTRACT:** The life expectancy of individuals with HIV has been dramatically improved since the introduction of combination antiretroviral therapy, but these drugs are still unable to cure the infection. Long-lived latent virus persists despite years of treatment, and if drugs are stopped at any point, the infection will quickly rebound. Major research efforts are now underway to develop therapies to permanently cure HIV. These include methods to eliminate remaining viral reservoirs, to boost immune control of the virus, or to render cells resistant to infection. I will present some of our work using mathematical modeling techniques to predict and assess the outcomes of these potential cure strategies. First, I will discuss how stochastic models of viral dynamics have helped us understand how much the pool of latent virus must be reduced delay or prevent viral rebound following treatment cessation. This model can be used to interpret recent cases of apparent cures, and to help plan and interpret future clinical trials. Secondly, I will discuss examples of how estimating viral dynamic parameters from drug trials data can help us determine mechanisms of drug action. This can be used to disentangle the effects of therapies with multiple modes of action. These models will cover a range of new HIV therapies, such as latency-reversing drugs, stem cell transplants, early treatment initiation, and gene-therapies.