



# Genome Sciences Seminar

Wednesday, 3.8.17 | 3:30 | Foege Auditorium

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## Dr. Leonid Mirny

Professor of Medical Engineering and Science, and Physics, MIT  
<http://mirnylab.mit.edu/>

# “Genome in 3D: biophysical models of chromosome folding”

### Mirny Lab:

#### Three dimensional organization of chromosomes

Beyond encoding information in their linear sequences, chromosomes are organized in three dimensions. We believe that chromosomal organization reflects an interplay between biological processes and statistical properties of polymer ensembles. The recent development of the biochemical chromosome conformation capture (3C) techniques, eg. Hi-C, complements advances in optical views of chromosomal organization. Our goal is to synthesize the high-resolution and high-throughput information from the former with information on cell-to-cell variability and dynamics obtained via the latter. Our approach combines bioinformatic and statistical analyses of experimental data with bottom-up polymer physics models of chromosomes.

#### Evolutionary Dynamics of Cancer

The development of cancer can be considered as an evolutionary process within an organism. During cancer progression, cells acquire mutations, compete for resources, and are selected for the ability to grow in a complex and dynamic environment. My goal is to understand how cancer's evolutionary history shapes its current state. For example, I am interested in how classical population genetics concepts, like genetic load, influence cancer progression and present new opportunities for cancer therapy. We are exploring this possibility using computational and analytical stochastic models of cancer progression, by analyzing massive cancer genomics data, and by testing therapeutic strategies in cell lines and mouse models via collaborations.

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Refreshments served outside the Auditorium at 3:20pm

Questions? Contact Brian Giebel at [bgiebel@uw.edu](mailto:bgiebel@uw.edu) or visit the Seminar website at <http://www.gs.washington.edu/news/seminars.htm>

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