



# Genome Sciences Seminar

Wednesday, 3.8.23 | 3:30 | Foege Auditorium

remote viewing option: <https://depts.washington.edu/gstrestrc/remote.htm>

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## Dr. Ian Ehrenreich

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<https://dornsife.usc.edu/labs/ehrenreich-lab-at-usc/>

## “Characterizing genotype-phenotype relationships in yeast using CRISPRi and chromosome synthesis”

Our lab focuses on three main problems.

### 1. Why do mutations show different effects among genetically distinct individuals?

Mutations that impact health and other traits often show different effects among individuals. These 'background effects' are largely caused by genetic polymorphisms that segregate within populations and genetically interact with the mutations. Our goal is to understand the architectures and molecular mechanisms underlying these interactions. Such information should aid efforts to predict how mutations will affect different individuals.

### 2. How do genetic changes individually and jointly produce phenotypic diversity?

Most traits of human interest are caused by multiple genetic variants that interact with each other and the environment. Despite decades of research, how these variants collectively produce phenotypic variation within populations remains a major question. We conduct experiments in model systems that make it possible to identify most of these variants. Our goal in these experiments is to reach definitive conclusions about the complexity and role of genetic interactions in heritable phenotypic variation.

### 3. Using synthetic genomics to understand genome-phenotype relationships.

Synthetic genomics is a nascent biological discipline centered on the synthesis of chromosomes and genomes. By enabling new scales and scopes of genetic manipulation, synthetic genomics has the potential to address longstanding biological questions that might not otherwise be answerable. We use synthetic genomic approaches to explore fundamental questions about genome-phenotype relationships within and between species, as well as to help understand the evolutionary history of life and its diversity.

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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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