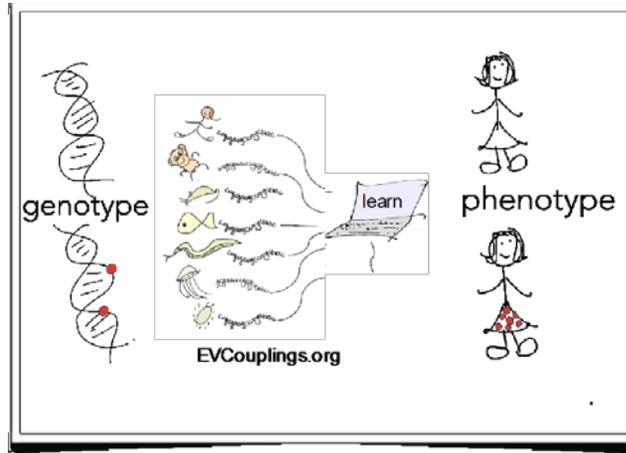




Learning the Secrets of Sequences with Deep Generative Models



What can we do with a million or a billion genomes? Understanding how variation across genomes shapes the properties of biomolecules, cells, and organisms is a foundational question in biomedicine and biotechnology. I will present examples of how generative modeling of genetic variation can give surprisingly direct answers to questions about 3D structures, dynamics and the effects of mutations. Our new work extends from the undirected models of genetic variation to deep directed models using a Variational Autoencoder for genetic variation. From purely unsupervised learning, we double the improvement of prior-art for predicting the effects of mutations. I will introduce challenges for extending these methods to diverse biomedical and engineering applications.

Dr. Debora Marks

Department of Systems Biology
Harvard University

Host: Dr. Gary Bader

Date: Monday October 30th, 2017

Time: 4PM

Place: Room 103, Fitzgerald Building,
150 College Street