

# NOAH DUKLER

1537 Laurel Hollow Road ♦ Syosset, NY 11791

(+1)845-417-8166 ♦ ndukler@gmail.com

## SELECTED PROJECTS

---

### Inferring the determinants of cis-regulatory evolution

- Developed novel method fitting parameters of phylogenetic processes as a function of site-wise covariates, enabling users to directly and jointly test multiple hypothesis about the evolution of discrete traits
- Applied method to apply these methods to previously published epigenetic data that serves as a proxy for gene regulatory element in liver tissue from nine mammals and found evidence for a variety of genomic feature correlating with differential evolutionary rates across multiple classes of cis-regulatory elements
- Implemented in R and C++ as phyloGLM package on GitHub (<https://github.com/ndukler/phlyoGLM>).

### Estimation of nascent transcript abundance

- Developed novel method for quantifying nascent RNA sequencing data at the gene and transcript levels
- Addresses the lack of exonic structure and increased noise particular to nascent RNA data with ML based filtering using TensorFlow that constrains the subsequent deconvolution step
- Implemented in R as the tuSelector2 package on GitHub (<https://github.com/ndukler/tuSelector2>)

### Analysis of rapid transcriptional dynamics after drug treatment

- Analysis of nascent RNA sequencing data to detect changes in transcription levels within minutes to distinguish primary from secondary responses to regulatory signals in response to celestrol, a compound with reported anti-inflammatory, tumor-inhibitory, and obesity-controlling effects
- Applied an auto-regressive clustering model to identify distinct temporal profiles of gene responses and identify associated pathways.
- Regressed estimated transcription factor affinities in promoters against time-course expression profiles to temporally resolve transcription factors driving transcriptional responses

## EDUCATION

---

### SUNY Geneseo

Bachelors of Biochemistry (B.S.) & Mathematics (B.A.)

Department of Biology, Department of Mathematics

*September 2009 - May 2013*

### Weill Cornell Graduate School of Medical Sciences

PhD. in Computational Biology

*July 2013 - December 2018*

### Cold Spring Harbor Laboratory

Post-Doctoral Researcher

*January 2019 - Present*

## SKILLS

---

<b>Machine Learning</b>	Graphical Models, Deep Learning, Generalized Linear Models
<b>Programming Languages</b>	R, Python, C++, Perl, Bash
<b>Pipeline Development</b>	Snakemake
<b>Software Development</b>	GitHub, Travis CI
<b>Data Visualization</b>	ggplot2, Adobe Illustrator

## SELECTED TALKS

---

**Leveraging comparative epigenomics to understand cis-regulatory evolution** Oct 2019  
Presented for Probabilistic Modeling in Genomics; Aussois, France

**Characterizing the genomic determinants of cis-regulatory element evolution with phylogenetic models** Jan 2019

Presented for New York Population Genetics Meeting at Mt. Sinai; NYC, NY

## SELECTED PUBLICATIONS

---

- (1) Noah Dukler, Yi-Fei Huang, and Adam Siepel. “Phylogenetic Modeling of Regulatory Element Turnover Based on Epigenomic Data”. In: *Molecular Biology and Evolution* (Mar. 2020). msaa073. DOI: 10.1093/molbev/msaa073.
- (2) Hussein A Hejase, Noah Dukler, and Adam Siepel. “From Summary Statistics to Gene Trees: Methods for Inferring Positive Selection”. In: *Trends in Genetics* (2020).
- (3) Jeffrey R Adrion et al. “A community-maintained standard library of population genetic models”. In: *bioRxiv* (2019).
- (4) Noah Dukler et al. “Is a super-enhancer greater than the sum of its parts?” In: *Nature genetics* 49.1 (2017), p. 2.
- (5) Noah Dukler et al. “Nascent RNA sequencing reveals a dynamic global transcriptional response at genes and enhancers to the natural medicinal compound celastrol”. In: *Genome research* 27.11 (2017), pp. 1816–1829.

## TEACHING

---

**Cold Spring Harbor Laboratory** 2019  
*ML course tutor*

Tutored machine learning course for graduate students and post-docs. Lectured, assisted with problem sets, and provided support for the application of course topics to individual course attendees projects.

**Cold Spring Harbor Laboratory** 2015-2016  
*CSHL PFF tutor*

Tutor for CSHL Partners for the Future Program. Tutored high school student in research project focused on gene regulation and transcription. Focused on developing scripting skills in R and applications of linear models.