

# Eric Kelsic

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## Education

- 2015: PhD in Systems Biology, Harvard University, Cambridge MA
- 2006: BS in Physics with Honors, California Institute of Technology, Pasadena CA
- 2002: High School Valedictorian, Longmont High School, Longmont CO

## Work Experience

**CEO & Cofounder**, Dyno Therapeutics, Cambridge MA, 2018-present

- Dyno Therapeutics creates novel adeno-associated virus (AAV) vectors that enable safe, efficient and targeted *in vivo* delivery for new gene and genome editing therapies

**Staff Scientist**, Wyss Institute at Harvard Medical School, Boston MA, 2015-2018

- Developed gene therapy technologies in lab of Prof. George Church
  - Developed a machine-guided AAV capsid engineering platform utilizing high-throughput DNA synthesis, DNA sequencing and machine learning
  - Developed assays to improve AAV capsids for higher delivery efficiency, better tissue and cell-type specificity, improved production titer, lower immunogenicity and evasion of pre-existing immunity

**PhD in Systems Biology**, Harvard University, Cambridge MA, 2008-2015

- Systems biology research in the lab of Prof. Roy Kishony
  - Discovered a new mechanism in which 3-way species interactions enable antibiotic producing, resistant and sensitive species to coexist, and developed experimental assays to measure these interactions
  - Developed MAGE-Seq, a method for high-throughput and systematic genome editing and phenotyping. Analyzed data from an essential gene to decipher multi-functional selection for optimal codon usage

**English Instructor**, Nankai University, Tianjin China, 2007-2008

- Taught 6 classes in speaking and writing to English majors (100 students)
- Mentored team China for the High School International Young Physicists Tournament

**Puzzle box inventor**, Longmont CO, 2000-2002

- Designed, constructed and marketed wooden puzzle boxes to collectors world-wide

## Selected Awards

- National Defense Science and Engineering Graduate (NDSEG) Fellowship

## Publications

Traud, **Kelsic**, Mucha, Porter. *Comparing Community Structure to Characteristics in Online Social Communities*. SIAM Review. Sept 2011 (cover article)

**Kelsic**. *Systematic approaches to deciphering genes and ecosystems*. PhD Thesis, Systems Biology, Harvard University. Jan 2015

**Kelsic**, Zhao, Vetsigian, Kishony. *Counteraction of antibiotic production and degradation generates stability in microbial communities*. Nature, May 2015

**Kelsic**, Vetsigian, Kishony. *Evolutionary stability of microbial communities with antibiotic degrading species*. Biorxiv, March 2016

Bairey, **Kelsic**, Kishony. *High-order species interactions shape ecosystem diversity*. Nature Communications, Aug 2016

Baym, Lieberman, **Kelsic**, Chait, Gross, Yelin, Kishony. *Spatiotemporal microbial evolution on antibiotic landscapes*. Science, Sept 2016

**Kelsic\***, Chung\*, Cohen, Park, Wang, Kishony. *RNA structural determinants of optimal codons revealed by MAGE-Seq*. Cell Systems, Dec 2016

Sinai, **Kelsic**, Church G, Nowak. *Variational auto-encoding of protein sequences*. Arxiv, Dec 2017

Guo, Chavez, Tung, Chan, Kaas, Yin, Cecchi, Garnier, **Kelsic**, Schubert, DiCarlo, Collins, Church. *High-throughput creation and functional profiling of DNA sequence variant libraries using CRISPR-Cas9 in yeast*. Nature biotechnology, June 2018

### Conference presentations

**Kelsic\***, Ogden\*, Church. *Systematic Functional Characterization of the AAV Capsid Fitness Landscape*. ASGCT 2018

**Kelsic**, Sinai, Ogden, Church. *Deep Search: Next-Gen Strategies for Accelerating AAV Capsid Engineering*. ASGCT 2018

**Kelsic**, Ogden, Sinai, Church. *Systematic Functional Characterization of the AAV Capsid Fitness Landscape*. International Parvovirus Workshop 2018