

# DAVID N.P. KOPPSTEIN

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## Education

Massachusetts Institute of Technology

Ph.D, Biology

CAMBRIDGE, MA

2015

Yale University

B.S., Molecular Biophysics and Biochemistry

NEW HAVEN, CT

2001 – 2002

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## Experience

Viral Immunology Systems Program, Kirby Institute, UNSW

SYDNEY, AUSTRALIA

**Postdoctoral Fellow**

Apr '17 – present

Developing computational methods for analyzing single-cell transcriptomics data of immune cells in the context of viral infection, including immune receptor reconstruction using VDJ-Puzzle. Mentoring two Ph.D students and one honors student.

Juno Therapeutics

SEATTLE, WA

**Data Scientist**

Jan '16 – Mar '17

Analyzed and communicated immunosequencing analyses for internal projects and external academic collaborators. Conducted analyses for internal RNA-seq and vector integration profiling projects. Served as interim manager of the data science team.

AbViro

BOSTON, MA

**Data Scientist**

Mar '15 – Dec '15

Designed bioinformatics pipeline for single-cell immunosequencing. Mined receptor sequences from tumor-infiltrating lymphocytes and nominated candidates for screening. (*Acquired by Juno Therapeutics*).

David Bartel Lab, MIT

BOSTON, MA

**Graduate Student**

May '10 – Mar '15

Designed, implemented, and analyzed high-throughput sequencing experiments using the Illumina platform to investigate influenza's cap-snatching repertoire. Utilized 3P-seq to precisely examine alternative cleavage and polyadenylation in diverse genetic backgrounds and model organisms.

Joan Steitz Lab, Yale

NEW HAVEN, CT

**Undergraduate Student**

May '06 – Apr '08

Investigated the function of Herpesvirus saimiri Small U RNAs (HSURs) by sequencing candidate targets and pulldowns.

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## Publications and Preprints

Grigaityte K, Carter JA, Goldfless SJ, Jefferey EW, Hause RJ, Jiang Y, **Koppstein D**, Briggs AW, Church GM, Vigneault F, Atwal GS. Single-cell sequencing reveals  $\alpha\beta$  chain pairing shapes the T cell repertoire. 2017. *bioRxiv*.

Rizzetto S, **Koppstein D**, Samir J, Singh M, Reed JH, Cai CH, Lloyd AR, Eltahla AA, Goodnow CC, Luciani F. B-cell receptor reconstruction from single-cell RNA-seq with VDJ-Puzzle. 2017. *bioRxiv*.

Briggs AW, Goldfless SJ, Timberlake S, Belmont BJ, Clouser CR, **Koppstein D**, Sok D, Vander Heiden JA, Tamminen MV, Kleinstein SH, Burton DR, Church GM, Vigneault F. 2017. Tumor-infiltrating immune repertoires captured by single-cell barcoding in emulsion. *bioRxiv*.

**Koppstein D**, Ashour J, and Bartel DP. Sequencing the cap-snatching repertoire of H1N1 influenza provides insight into the mechanism of viral transcription initiation. 2015. *Nucleic Acids Research* 43(10), 5052-5064.

Hezroni H, **Koppstein D**, Schwartz M, Tabin CJ, Bartel DP, and Ulitsky I. 2015. Principles of long noncoding RNA evolution derived from direct comparison of transcriptomes in 14 vertebrates. *Cell Reports* 11(7), 1110-1122.

Nam J-W, Rissland OS, **Koppstein D**, Abreu-Goodger C, Jan CH, Agarwal V, Yildirim, Rodriguez A, and Bartel DP. 2014. Global Analyses of the Effect of Different Cellular Contexts on MicroRNA Targeting. *Molecular Cell*. 53, 1031-1043.

Ulitsky I, Shkumatava A, Jan C, Subtelny AO, **Koppstein D**, Bell G, Sive H, and Bartel DP. 2012. Extensive alternative polyadenylation during zebrafish development. *Genome Research*. 22(10):2054-66.

Agarwal A\*, **Koppstein D\***, Rozowsky J, Sboner A, Habegger L, Hillier LW, Sasidharan R, Reinke V, Waterston RH, and Gerstein M. 2010. Comparison and calibration of transcriptome data from RNA-Seq and tiling arrays. *BMC Genomics*. 11:383.

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\* Authors contributed equally to this publication.

Mukhopadhyay J, Das K, Ismail S, **Koppstein D**, Jang M, Hudson B, Sarafianos S, Tuske S, Patel J, Jansen R, Irschik H, Arnold E, and Ebright RH. 2008. Myxopyronin, Coralopyronin, and Ripostatin Inhibit Transcription by Binding to the RNA Polymerase Switch Region. *Cell*. 135:295-307.

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## Presentations and Posters

**Koppstein D**, Rizzetto S, Samir J, Singh M, Reed JH, Cai CH, Lloyd AR, Eltahla AA, Goodnow CC, Luciani F. VDJ Puzzle: A computational method for BCR and TCR reconstruction from single-cell sequencing data. Australian Bioinformatics And Computational Biology Society. Oral presentation delivered in Adelaide, Australia, November 2017.

**Koppstein D** Rizzetto S, Samir J, Singh M, Reed JH, Cai CH, Lloyd AR, Eltahla AA, Goodnow CC, Luciani F. VDJ Puzzle: A computational method for BCR and TCR reconstruction from single-cell sequencing data. Australian Cellular Panomics Consortium. Poster presentation delivered in Melbourne, Australia, November 2017.

**Koppstein D**, Rizzetto S, Samir J, Singh M, Reed JH, Cai CH, Lloyd AR, Eltahla AA, Goodnow CC, Luciani F. VDJ Puzzle: A computational method for BCR and TCR reconstruction from single-cell sequencing data. Australian Society for Immunology. Oral presentation delivered in Bowral, Australia, November 2017.

**Koppstein D**, Ashour J, Bartel D. Quantitative assessment of influenza's cap-snatching repertoire by RNA sequencing. RNA Society. Poster presentation delivered in Quebec City, Canada, June 2014.

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## Skills

### Wet lab

Extensive experience with Illumina library preparation and custom experiment design: Poly(A)-Position Profiling (3P-Seq), SMART-seq, vector integration sequencing (VIS-seq), and standard RNA-seq. Experience with molecular cloning, tissue culture maintenance and transfection, Northern/Western blots, protein purification, PCR, and yeast genetics.

### Dry lab

Fluent in Python and R. Expertise with modern bioinformatics tools including samtools, bedtools, STAR, featureCounts, edgeR, limma, Picard, Kallisto, etc. Experience with analysing single cell sequencing data using scater, Seurat, SC3, zingeR, etc. Experience writing scalable computational pipelines for industrial next-generation sequencing assays using Snakemake. Experience with statistical methods and machine learning techniques. Experience administering Amazon EC2 clusters using CFNCluster and Ansible. Experience managing a team of computational biologists using agile methods including Scrum and continuous integration.

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## Fellowships and Awards

- Juno CEO Discretionary Award for Outstanding Performance, 2016
  - NSF Graduate Research Fellowship Program, Honorable Mention, 2011
  - Yale STARS II Research Fellowship, 2007-8
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## Extracurricular

- MIT Urban Cycling Skills and Safety Clinic Organizer, 2013-4
  - Whitehead Partner for High School Science Teacher Outreach, 2012
  - MIT Cycling Team Officer, 2012-2014
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## References

References are available upon request.