Christopher J. Benway

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Summary

I am currently a post-doctoral researcher at Brigham and Women's Hospital and Harvard Medical School Channing Division of Network Medicine working on genetics and functional genomics of chronic obstructive pulmonary disease (COPD). My current research involves genome-wide association studies, statistical genetics and fine-mapping, transcriptomics, and chromatin accessibility assays. During my Ph.D. in the lab of John Iacomini at Tufts University Sackler School of Biomedical Sciences I worked on *in vivo* and cell-based models of calcineurin inhibitor nephrotoxicity, using transcriptomics and sequencing methods to detect *in vivo* miRNA:mRNA targeting. In prior work as a research technician I have largely worked on molecular and cell biology projects related to immune function, ER stress, gene therapy, and high throughput chemical biology screens.

Education

2011–2017	Ph.D. in Genetics, Tufts University, Boston, MA. PhD thesis: *Defining a microRNA-mRNA targetome for calcineurin inhibitor induced nephrotoxicity*
2004–2008	A.B. in Biology, Harvard University, Cambridge, MA.

Past Scientific Positions

2017–2020	**Postdoctoral Research Fellow** Brigham and Women's Hospital and Harvard Medical School, Channing Division of Network Medicine, Boston, MA. Advisers: Edwin K. Silverman, M.D., Ph.D. and Xiaobo Zhou, Ph.D.
2011–2017	**Graduate Research Assistant** Tufts University Sackler School of Biomedical Sciences, Department of Developmental, Molecular and Chemical Biology, Boston, MA. Adviser: John Iacomini, Ph.D.
2009–2011	**Research Assistant** Harvard Medical School, Department of Genetics, Boston, MA. Richard C. Mulligan, Ph.D. Laboratory
2008–2009	**Research Assistant** Harvard School of Public Health, Department of Immunology and Infectious Diseases, Boston, MA. Laurie H. Glimcher, M.D. Laboratory
2007	**Research Assistant** Harvard University, Department of Organismic and Evolutionary Biology, Cambridge, MA. Noel Michele Holbrook, Ph.D. Laboratory
2006	**Research Assistant** Harvard University, Department of Molecular and Cellular Biology, Cambridge, MA.

Sam Kunes, Ph.D. Laboratory

2005–2006 **Research Assistant**
Brigham and Women's Hospital and Harvard Medical School, Division of Genetics, Department of Medicine, Cambridge, MA.
Alan M. Michelson, M.D., Ph.D. Laboratory

Research Interests

- Dissecting the genetic contributions to complex disease
- Investigating the biological role of genetic variation associated with complex diseases and decoding the functional role of sequence variation in biological pathways
- Genomics, epigenomics, transcriptomics; special interest in small non-coding RNAs such as microRNAs.
- Integration of multiple 'omic datatypes; network medicine

Scientific Meetings

2019 **COPDGene Investigators Meeting**
Boston, MA
Attendee

2019 **American Society of Human Genetics (ASHG) Annual Meeting**
Houston, TX
Poster Presentation: *Assaying lung-specific accessible chromatin to predict the causal variants in COPD.* C. J. Benway, J. Liu, F. Du, M. H. Cho, E. K. Silverman, X. Zhou. (abstract, poster)

2019 **HMS Epigenetics and Gene Dynamics Symposium**
Boston, MA
Poster Presentation: *Assaying lung-specific accessible chromatin to predict the causal variants in COPD.* C. J. Benway, J. Liu, F. Du, M. H. Cho, E. K. Silverman, X. Zhou. (poster)

2019 **American Thoracic Society (ATS) Conference**
Dallas, TX
Poster Presentation: *Genome-Wide Association Study of Parametric Response Mapping in the COPDGene Study Dissects Genetic Contributions to Emphysema and Functional Small Airway Disease.* C. J. Benway, P. Sakornsakolpat, J. Ross, B.D. Hobbs, M.H. Cho, E.K. Silverman. (abstract, poster)

2018 **COPDGene Investigators Meeting**
Denver, CO
Attendee

2018 **Discover Brigham**
Boston, MA
Poster presentation: *Chromatin accessibility landscapes of large and small airway cells annotate multiple COPD susceptibility GWAS regions.* C. J. Benway, F. Du, M. H. Cho, E. K. Silverman, X. Zhou. (e-poster)
Research Open Mic: *From GWAS to Function: Uncovering the causal genetic variants in COPD*

2018 **American Society of Human Genetics (ASHG) Annual Meeting**

San Diego, CA
Poster Presentation: *Chromatin accessibility landscapes of large and small airway cells annotate multiple COPD susceptibility GWAS regions.* C. J. Benway, F. Du, M. H. Cho, E. K. Silverman, X. Zhou. Reviewer's Choice Abstract (abstract, poster)

2017 **American Society of Human Genetics (ASHG) Annual Meeting**
Orlando, FL
Attendee

2017 **COPDGene Investigators Meeting**
Boston, MA
Attendee

2016 **Tufts Charlton Poster Competition**
Boston, MA
Poster Presentation: *Ago-PAR-CLIP Defines Targetome and Role of MicroRNAs in Cyclosporine-induced Nephrotoxicity.* C. J. Benway, J. Iacomini (poster)

2015 **EMBO/EMBL Symposium: The Non-Coding Genome**
Heidlberg, Germany
Poster Presentation: *Ago-PAR-CLIP Defines MicroRNA Targets in Human Proximal Tubule Epithelial Kidney Cells.* C.J. Benway, J. Iacomini (poster)

2015 **24th Short Course on Experimental Models of Human Cancer**
The Jackson Laboratory, Bar Harbor, Maine
Attendee

2015 **Non-Coding RNA: New Mechanisms and Approaches**
Boston, MA
Attendee

Bioinformatic and Computer Skills

- Data analysis of high-throughput sequencing data including DNA-seq, RNA-seq, ATAC-seq, and ChIP-seq.
- Knowledge and ability to use various bioinformatic databases, APIs, repositories, and tools.
- Knowledge and and ability to script in R and use reproducible research tools such as Markdown/R Markdown.
- Ability to implement bioinformatic pipelines using pipelining tools.

Academic References

Edwin Kepner Silverman, Ph.D., M.D.
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John Iacomini, Ph.D.
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Publications

[1] C. J. Benway, J. Liu, F. Guo, F. Du, M. H. Cho, E. K. Silverman, and X. Zhou. Chromatin Landscapes of Lung Cell Types Predict Functional COPD GWAS Variants. Manuscript in preparation.

[2] Y. Hao*, S. Bates*, B. Pham, H. Mou, J. Liu, W. Qiu, J. D. Morrow, C. P. Hersh, L. Gong, F. Guo, C. J. Benway, I. O. Rosas, M. H. Cho, J. Park, P. J. Castaldi, F. Du, and X. Zhou. Idiopathic pulmonary fibrosis (IPF) functional variant rs2076295 regulates Desmoplakin (DSP) gene-mediated cell migration. *Am. J. Respir. Cell Mol. Biol.*, under review.

[3] K. E. Lowe, E. A. Regan, A. Anzueto, E. Austin, J. H. M. Austin, T. H. Beaty, P. V. Benos, C. J. Benway, S. P. Bhatt, E. R. Bleecker, S. Bodduluri, J. Bon, A. M. Boriek, A. R. Boueiz, R. P. Bowler, M. Budoff, R. Casaburi, P. J. Castaldi, J. P. Charbonnier, M. H. Cho, A. Comellas, D. Conrad, C. Costa Davis, G. J. Criner, D. Curran-Everett, J. L. Curtis, D. L. DeMeo, A. A. Diaz, M. T. Dransfield, J. G. Dy, A. Fawzy, M. Fleming, E. L. Flenaugh, M. G. Foreman, S. Fortis, H. Gebrekristos, S. Grant, P. A. Grenier, T. Gu, A. Gupta, M. K. Han, N. A. Hanania, N. N. Hansel, L. P. Hayden, C. P. Hersh, B. D. Hobbs, E. A. Hoffman, J. C. Hogg, J. E. Hokanson, K. F. Hoth, A. Hsiao, S. Humphries, K. Jacobs, F. L. Jacobson, E. A. Kazerooni, V. Kim, W. J. Kim, G. L. Kinney, H. Koegler, S. M. Lutz, D. A. Lynch, N. R. MacIntye, B. J. Make, N. Marchetti, F. J. Martinez, D. J. Maselli, A. M. Mathews, M. C. McCormack, M. N. McDonald, C. E. McEvoy, M. Moll, S. S. Molye, S. Murray, H. Nath, J. D. Newell, M. Occhipinti, M. Paoletti, T. Parekh, M. Pistolesi, K. A. Pratte, N. Putcha, M. Ragland, J. M. Reinhardt, S. I. Rennard, R. A. Rosiello, J. C. Ross, H. B. Rossiter, I. Ruczinski, R. San Jose Estepar, F. C. Sciurba, J. C. Sieren, H. Singh, X. Soler, R. M. Steiner, M. J. Strand, W. W. Stringer, R. Tal-Singer, B. Thomashow, G. Vegas Sanchez-Ferrero, J. W. Walsh, E. S. Wan, G. R. Washko, J. Michael Wells, C. H. Wendt, G. Westney, A. Wilson, R. A. Wise, A. Yen, K. Young, J. Yun, E. K. Silverman, and J. D. Crapo. COPDGene® 2019: Redefining the Diagnosis of Chronic Obstructive Pulmonary Disease. *Chronic Obstr Pulm Dis*, 6(5):384–399, Nov 2019. [DOI:10.15326/jcopdf.6.5.2019.0149] [PubMed:31710793].

[4] C. J. Benway, P. Sakornsakolpat, J. Ross, B. D. Hobbs, M. H. Cho, and E. K. Silverman. Genome-Wide Association Study of Parametric Response Mapping in the COPDGene Study Dissects Genetic Contributions to Emphysema and Functional Small Airway Disease. *American Thoracic Society*, May 2019.

[5] M. F. Ragland*, C. J. Benway*, S. M. Lutz, R. P. Bowler, J. Hecker, J. E. Hokanson, J. D. Crapo, P. J. Castaldi, D. L. DeMeo, C. P. Hersh, B. D. Hobbs, C. Lange, T. H. Beaty, M. H. Cho, and E. K. Silverman. Genetic Advances in Chronic Obstructive Pulmonary Disease. Insights from COPDGene. *Am. J. Respir. Crit. Care Med.*, 200(6):677–690, Sep 2019. [PubMed Central:PMC6775891] [DOI:10.1164/rccm.201808-1455SO] [PubMed:26221665].

[6] C. J. Benway and J. Iacomini. Defining a microRNA-mRNA interaction map for calcineurin inhibitor induced nephrotoxicity. *Am. J. Transplant.*, 18(4):796–809, 04 2018. [DOI:10.1111/ajt.14503] [PubMed:28925592].

[7] J. Yuan, C. J. Benway, J. Bagley, and J. Iacomini. MicroRNA-494 promotes cyclosporine-induced nephrotoxicity and epithelial to mesenchymal transition by inhibiting PTEN. *Am. J. Transplant.*, 15(6):1682–1691, Jun 2015. [DOI:10.1111/ajt.13161] [PubMed:25854542].