

MARY ANN ALLEN

EDUCATION

- PhD** University of Colorado-Boulder, May 2010
Molecular, Cellular, and Developmental Biology
Dissertation: “RNA Processing Events Affecting *C. elegans* Operons: a Computational and Mutational Analysis”
Advisor: Tom Blumenthal
- MS** University of Wisconsin May 2006
Cellular and Molecular Biology
Advisor: Elizabeth Goodwin
- BA** Spring Arbor University May 2000
Biochemistry

HONORS AND AWARDS.

- Sie Research Faculty Fellow** 2017-present
Exploring the molecular basis of expression dysregulation in Down syndrome.
- Sie Post-doctoral Fellow** 2014-2017
Brief description

RESEARCH EXPERIENCE

- Post-doctoral Research Assistant**, University of Colorado, Boulder Co 2010-2014
Advisor: Robin Dowell and Joaquin Espinosa
- Determined global p53 effects on transcription.
- Dissertation**, University of Colorado, Boulder Co 2006-2010
Advisor: Tom Blumenthal
- Investigated 3' end formation of Pol II-transcribed genes and global trans-splicing regulation.
- Graduate Research Assistant**, University of Wisconsin, Madison WI 2002 to 2006
Advisor, Elizabeth Goodwin
- Studied the functions of the *laf-1* sex determination gene.
- Research Technician**, - University of Michigan, Ann Arbor MI 2000 to 2002
PI: Andrzej Dlugosz
- Researched the effects of Hedgehog signaling in sebaceous gland formation.

Lab Assistant, - - Spring Arbor University, Spring Arbor
Supervisors: David Johnson, Ph.D. and Michael Buratovich

- Prepared chemicals, equipment, and cultures.

1999 to 2000

PUBLICATIONS

Journal Papers in Review

Kurland, J.V., Van Deusen, A., Pawlikowski, B., Hall, M., Dalla Betta, N., Antwine, T., Cutler, A.C., Russell, A., Allen, M.A., Dowell, R. and Olwin, B., 2021. Myonuclear maturation dynamics in aged and adult regenerating mouse skeletal muscle. bioRxiv.

Journal Papers Accepted

Hunter, S., Sigauke, R., Stanley, J., Allen, M. and Dowell, R., 2021. Protocol Variations in Run-On Transcription Dataset Preparation Produce Detectable Signatures in Sequencing Libraries.

Journal Publications

Janiszewski, L.N., Minson, M., Allen, M.A., Dowell, R.D. and Palmer, A.E., 2021. Characterization of Global Gene Expression, Regulation of Metal Ions, and Infection Outcomes in Immune-Competent 129S6 Mouse Macrophages. *Infection and Immunity*, 89(11), pp. e00273-21.

Walker, C.J., Crocini, C., Ramirez, D., Killaars, A.R., Grim, J.C., Aguado, B.A., Clark, K., Allen, M.A., Dowell, R.D., Leinwand, L.A. and Anseth, K.S., 2021. Nuclear mechanosensing drives chromatin remodelling in persistently activated fibroblasts. *Nature biomedical engineering*, pp.1-15.

Cardiello, J.F., Sanchez, G.J., Allen, M.A. and Dowell, R.D., 2020. Lessons from eRNAs: understanding transcriptional regulation through the lens of nascent RNAs. *Transcription*, 11(1), pp.3-18.

Stanley, J.T., Gilchrist, A.R., Stabell, A.C., Allen, M.A., Sawyer, S.L. and Dowell, R.D., 2019. Two-stage ML classifier for identifying host protein targets of the dengue protease. In *PACIFIC SYMPOSIUM ON BIOCOMPUTING 2020* (pp. 487-498).

Sasse, S.K., Gruca, M., Allen, M.A., Kadiyala, V., Song, T., Gally, F., Gupta, A., Pufall, M.A., Dowell, R.D. and Gerber, A.N., 2019. Nascent transcript analysis of

glucocorticoid crosstalk with TNF defines primary and cooperative inflammatory repression. *Genome research*, 29(11), pp.1753-1765

Smith, D.G., Martinelli, R., Besra, G.S., Illarionov, P.A., Szatmari, I., Brazda, P., Allen, M.A., Xu, W., Wang, X., Nagy, L. and Dowell, R.D., 2019. Identification and characterization of a novel anti-inflammatory lipid isolated from *Mycobacterium vaccae*, a soil-derived bacterium with immunoregulatory and stress resilience properties. *Psychopharmacology*, 236(5), pp.1653-1670.

Melnick, M., Gonzales, P., Cabral, J., Allen, M.A., Dowell, R.D. and Link, C.D., 2019. Heat shock in *C. elegans* induces downstream of gene transcription and accumulation of double-stranded RNA. *PloS one*, 14(4), p.e0206715.

Allen, M.A., 2019. Train students to navigate ethical swamps. *Nature*, 568(7751), pp.145-146.

Tripodi, I.J., Allen, M.A. and Dowell, R.D., 2018. Detecting differential transcription factor activity from ATAC-seq data. *Molecules*, 23(5), p.1136.

Azofeifa, J.G., Allen, M.A., Hendrix, J.R., Rubin, J.D. and Dowell, R.D., 2018. Enhancer RNA profiling predicts transcription factor activity. *Genome research*, 28(3), pp.334-344.

Ebmeier, C.C., Erickson, B., Allen, B.L., Allen, M.A., Kim, H., Fong, N., Jacobsen, J.R., Liang, K., Shilatifard, A., Dowell, R.D. and Old, W.M., 2017. Human TFIIH kinase CDK7 regulates transcription-associated chromatin modifications. *Cell reports*, 20(5), pp.1173-1186.

Lladser, M.E., Azofeifa, J.G., Allen, M.A. and Dowell, R.D., 2017. RNA Pol II transcription model and interpretation of GRO-seq data. *Journal of mathematical biology*, 74(1-2), pp.77-97.

Azofeifa, J.G., Allen, M.A., Lladser, M.E. and Dowell, R.D., 2016. An annotation agnostic algorithm for detecting nascent RNA transcripts in GRO-seq. *IEEE/ACM transactions on computational biology and bioinformatics*, 14(5), pp.1070-1081.

Azofeifa, J., Allen, M.A., Lladser, M. and Dowell, R., 2014, September. FStitch: A fast and simple algorithm for detecting nascent RNA transcripts. In *Proceedings of the 5th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics* (pp. 174-183).

Allen, M.A., Andrysik, Z., Dengler, V.L., Mellert, H.S., Guarneri, A., Freeman, J.A., Sullivan, K.D., Galbraith, M.D., Luo, X., Kraus, W.L. and Dowell, R.D., 2014. Global analysis of p53-regulated transcription identifies its direct targets and unexpected regulatory mechanisms. *Elife*, 3, p.e02200.

Allen, M. and Dowell, R., 2013. Retrospective reflections of a whistleblower: Opinions on misconduct responses. *Accountability in research*, 20(5-6), pp.339-348.

Galbraith, M.D., Allen, M.A., Bensard, C.L., Wang, X., Schwinn, M.K., Qin, B., Long, H.W., Daniels, D.L., Hahn, W.C., Dowell, R.D. and Espinosa, J.M., 2013. HIF1A employs CDK8-mediator to stimulate RNAPII elongation in response to hypoxia. *Cell*, 153(6), pp.1327-1339.

Grachtchouk, M., Pero, J., Yang, S.H., Ermilov, A.N., Michael, L.E., Wang, A., Wilbert, D., Patel, R.M., Ferris, J., Diener, J. and Allen, M., Lim S, Syu L, Verhaegen M, Dlugosz AA, 2011. Basal cell carcinomas in mice arise from hair follicle stem cells and multiple epithelial progenitor populations. *The Journal of clinical investigation*, 121(5), pp.1768-1781.

Allen, M.A., Hillier, L.W., Waterston, R.H. and Blumenthal, T., 2011. A global analysis of *C. elegans* trans-splicing. *Genome research*, 21(2), pp.255-264.

Lasda, E.L., Allen, M.A. and Blumenthal, T., 2010. Polycistronic pre-mRNA processing in vitro: snRNP and pre-mRNA role reversal in trans-splicing. *Genes & development*, 24(15), pp.1645-1658.

*Cui, M., *Allen, M.A., Larsen, A., MacMorris, M., Han, M. and Blumenthal, T., 2008. Genes involved in pre-mRNA 3'-end formation and transcription termination revealed by a lin-15 operon Muv suppressor screen. *Proceedings of the National Academy of Sciences*, 105(43), pp.16665-16670. (*Contributed equally to this work.)

Vicens, Q., Allen, M.A., Gilbert, S.D., Reznik, B., Gooding, A.R. and Batey, R.T., 2008. The Cech Symposium: A celebration of 25 years of ribozymes, 10 years of TERT, and 60 years of Tom. *RNA*, 14(3), pp.397-403.

Allen, M., Grachtchouk, M., Sheng, H., Grachtchouk, V., Wang, A., Wei, L., Liu, J., Ramirez, A., Metzger, D., Chambon, P. and Jorcano, J., 2003. Hedgehog signaling regulates sebaceous gland development. *The American journal of pathology*, 163(6), pp.2173-2178.

PATENTS

R.D. Dowell, J. Azofeifa and **M.A. Allen**, "Assessment of Transcription Factor Activity,"
Filed Feb 14th, 2018

PCT Application No. PCT/US2018/0182330

CU TTO File No. CU4226B-PCTI

GRANTS

- NIH R01 HL156475; Role: PI 02/01/21-03/31/25
Function of RUNX1 in diverse Down syndrome tissues
- AB Nexus cross campus grant; Role Co-I 12/1/20-12/1/21
Identification of an embryonic cell-intrinsic cancer checkpoint
- NIH R01 GM125871A; Role: Co-I 09/25/18-06/30/22
A Technique for Measuring Transcription Factor Activity
- Sie Research Faculty Fellowship 2017-2000
- Sie Post-Doctoral Fellowship 2014-2017
- 2013 and 2014 LCI Seed Grants (PI: Dowell), co-authored 2013, 2014
- Colorado Biomedical Informatics Training Program 2012-2014
- Computational Bioscience Program Training Grant 2011-2012

PRESENTATIONS AND INVITED LECTURES

- ◆ Research Reproducibility 2020: Educating for Reproducibility
Panel Title: Student Experience & Support 3-Dec-20
- ◆ 34nd Annual MD/PhD Student Conference, Keystone, Colorado.
Talk title: Surviving the ethical swamps of scientific research 14-July-19
- ◆ 33nd Annual MD/PhD Student Conference, Keystone, Colorado.
Talk title: Surviving the ethical swamps of scientific research 14-July-18
- ◆ 32nd Annual MD/PhD Student Conference, Keystone, Colorado.
Talk title: Surviving the ethical swamps of scientific research 16-July-17
- ◆ National Data Integrity Conference, University of Colorado-Denver.
Talk title: “A key to unlocking the function of non-coding variations in disease: data sharing nascent transcription reanalysis” 2-Jun-16
- ◆ Interdisciplinary Quantitative Biology Student Symposium, University of Colorado-Boulder.
Talk title: “The transcriptional landscape of trisomy 21” 10-Mar-15
- ◆ WISE Science Communication Symposium, University of Colorado-Boulder.
Talk title: “Who is typical? An individual with Down Syndrome” 21-Apr-16
- ◆ Linda Crnic Annual Down Syndrome Symposium, University of Colorado-Denver.
Talk title: “The transcriptional landscape of trisomy 21” 31-Oct-14
- ◆ NLM Informatics Training Conference, University of Utah.
Talk title: “The p53 Transcriptome” (plenary session) 18-Jun-13
- ◆ ORI at 20: Reassessing Research Integrity-A Leadership Conference, Baltimore, MD.
Talk title: “Challenges in protecting whistleblowers—A whistleblowers account of a case” (invited speaker) 5-Apr-13
- ◆ 10th Annual Rocky Mountain Bioinformatics Conference, Snowmass Village, CO.
Talk title: “Rediscovery of the p53 transcriptome” 7-Dec-12
- ◆ Committee on Responsible Science, Washington, DC.
Talk title: “Prevention, Protection, Progress” (invited speaker) 14-Aug-12
- ◆ 9th Annual Rocky Mountain Bioinformatics Conference, Snowmass Village, CO.
Talk title: “Rediscovery of the p53 transcriptome” 9-Dec-11
- ◆ 16th International C. elegans Meeting, University of California – Los Angeles.
Talk title: “Analysis of transcription of the entire genome on tiling microarrays” (plenary session) 28-Jun-08

- ◆ Ethics panel, University of Illinois at Urbana – Champaign.
Panel title: “Truth and consequences: What happened when a group of University of Wisconsin students learned their advisor faked data” 8-Dec-06
- ◆ 2004 Mid-West Worm Meeting, Kansas University.
Talk title: “Sex determination gene *laf-1* is a processed non-coding RNA” 12-Jul-04

TEACHING EXPERIENCE

- Instructor of GRAD5000, Responsible Conduct of Research- University of Colorado-Boulder. 2018-present
- Instructor for GRO-seq workshop - University of Colorado-Boulder. 2016, 2019
- Workshop Instructor for Short Read Sequence Analysis - University of Colorado-Boulder. 2014-15 and 2017-19 and 2021
- Research Mentor - University of Colorado Boulder. 2007-present
- Physics Instructor - The DaVinci Institute. (charter high school - Jackson, MI) 1999
- Teaching Assistant- General Chemistry and Organic Chemistry I and II t - Spring Arbor University. 1997-1999

LEADERSHIP

Member of University of Colorado Values and Ethics Committee, CU-Boulder (2018-2020). Participated in a work group with the goal of increasing integrity on the CU Boulder campus. We also reviewed the current state of ethics related policies on campus.

Member of BioFrontiers Compute Committee, BioFrontiers Colorado Boulder (2018-current). Participated in a work group with the goal of optimizing use of the BioFrontiers super computer.

Organized a Down syndrome Journal club, BioFrontiers CU-Boulder (2014-2020). I started this group to create connections between the Down syndrome research community on the Boulder campus and to improve our knowledge of the Down syndrome related literature. I have invited all members of the Boulder campus who work on Down syndrome or wish to work on Down syndrome. We meet once or twice a month to discuss the current Down syndrome related publications.

Developed/Organized a two-week Workshop on Short Read Sequencing Analysis, BioFrontiers CU-Boulder (2014, 2015, 2017,2018, 2019). I outlined each topic to be covered, then recruited Dowell Lab members to teach subsections. Class was taught reverse-classroom style, so I produced and edited videos. Also, undertook advertising and communication with students. Finally, I've lectures that focused short read sequencing analysis steps.

Member of Post-doctoral Writing Group, BioFrontiers CU-Boulder (2011-2014). I started this group to improve post-doctoral writing skills. We meet twice a month to discuss and edit the publication and grant drafts of each member.

Chair of the Graduate Student Symposium Committee, MCDB CU-Boulder (2007- 2008). I led a committee of four students organizing the biennial graduate student symposium. We chose and invited speakers. We developed and prepared all necessities for the symposium held on Oct. 24-25th, 2008.

Faculty Representative for Graduate Students, MCDB CU-Boulder (2007- 2008). I was chosen by fellow students to represent MCDB graduate students at the monthly faculty meetings. I polled the opinions of the graduate students in the department about ideas presented by the faculty and reported student responses back to the faculty.