

Abigail Lynn Davidson Tadenev

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Education and Training

- 2011-2015 **Postdoctoral Fellow**, The Jackson Laboratory, Bar Harbor, ME
Advisor: Dr. Robert W. Burgess
- 2003-2011 **Ph.D.**, Program in Cellular and Molecular Medicine,
The Johns Hopkins University School of Medicine, Baltimore, MD
Advisor: Dr. Randall R. Reed
- 2003 **B.A.**, Williams College, Williamstown, MA
Biology Major, Neuroscience concentration
Graduated *Magna Cum Laude* with Honors in Neuroscience.

Research Experience

- 2018-present **Program Manager of the JAX Center for Precision Genetics and Associate Research Scientist** in the laboratory of Dr. Robert Burgess, The Jackson Laboratory
- Manage various aspects of the JAX Center for Precision Genetics, including enhancing coordination among units, tracking progress within the cores and projects, and communicating with the funding agency.
 - Evaluate new mouse models of neuromuscular disease using molecular biology and phenotyping approaches including RT-PCR, western blotting, histology, behavioral tests of motor performance, and neurophysiology.
- 2015-2018 **Associate Research Scientist** in the laboratory of Dr. Basile Tarchini, The Jackson Laboratory.
- Responsible for management and daily operations needed to carry out the Specific Aims of Dr. Tarchini's R01 grant entitled *Hair cell polarization and sensory bundle development*.
 - Helped develop and optimize new experimental protocols for the laboratory, including auditory brainstem response testing, dissection of adult mouse cochlea, and preparation of samples for scanning electron microscopy.
 - Co-authored a book chapter on the post-mitotic roles of the mitotic spindle orientation machinery.
 - Developed proficiency in microdissection of murine cochlea for culture, immunofluorescence, and scanning electron microscopy.
- 2011-2015 **Postdoctoral Associate** with Dr. Robert Burgess, The Jackson Laboratory.
- Examined the role of *Down Syndrome Cell Adhesion Molecule (Dscam)* and related genes in retinal development.
 - Characterized the mutation and phenotypes of *high stepper* and related mutant mice.

- 2003-2011 **Doctoral research** with Dr. Randall Reed, Department of Neuroscience & Department of Molecular Biology and Genetics, The Johns Hopkins University School of Medicine.
- Studied the molecular and cellular basis of Bardet-Biedl Syndrome (BBS) phenotypes in olfaction.
 - Investigated pathways for protein trafficking and localization within specialized subcellular compartments.
 - Created and analyzed genetically modified mice to reveal novel phenotypes in a *Bbs8* knockout and to visualize protein trafficking *in vivo*.
- 2001-2003 **Undergraduate thesis research** with Dr. Betty Zimmerberg, Williams College. Thesis title: The Role of Allopregnanolone in Differentiating Lines Selectively Bred for Infantile Vocalizations.

Awards and Honors

- 2013-2015 Recipient of an F32 National Institutes of Health National Research Service Award (NRSA)
- 2012-2016 Recipient of National Institutes of Health Pediatric Loan Repayment Program award
- 2003 Recipient of Turock Award, The Johns Hopkins School of Medicine
- 2002 Phi Beta Kappa

Publications

- Tadenev ALD**, Burgess RW (2019). Model validity for preclinical studies in precision medicine: precisely how precise do we need to be? *Mamm Genome* 30(5-6):111-122. doi: 10.1007/s00335-019-09798-0.
- Tadenev ALD**, Akturk A, Devanney N, Mathur PD, Clark AM, Yang J, Tarchini B (2019). GPSM2-GNAI Specifies the Tallest Stereocilia and Defines Hair Bundle Row Identity. *Curr Biol* 29(6):921-934.e4. doi: 10.1016/j.cub.2019.01.051.
- Tarchini B, Longo-Guess C, Tian C, **Tadenev ALD**, Devanney N, Johnson KR (2018). A spontaneous mouse deletion in *Mctp1* uncovers a long-range enhancer crucial for NR2F1 function during inner ear development. *Dev Biol* 443(2):153-164. doi: 10.1016/j.ydbio.2018.09.011.
- Tadenev ALD**, and Tarchini B (2017). The Spindle Orientation Machinery Beyond Mitosis: When Cell Specialization Demands Polarization. *Adv Exp Med Biol* 1002:209-225. doi: 10.1007/978-3-319-57127-0_9.
- Tarchini B, **Tadenev AL**, Devanney N, and Cayouette M (2016). A link between planar polarity and staircase-like bundle architecture in hair cells. *Development* 143(21):3926-3932. doi: 10.1242/dev.139089.
- Garrett AM, **Tadenev AL**, Hammond YT, Fuerst PG, and Burgess RW (2016). Replacing the PDZ-interacting C-termini of DSCAM and DSCAML1 with epitope tags causes different phenotypic severity in different cell populations. *eLife* 5. pii: e16144. doi: 10.7554/eLife.16144.
- Fairfield H, Srivastava A, Ananda G, Liu R, Kircher M, Lakshminarayana A, Harris BS, Karst SY, Dionne LA, Kane CC, Curtain M, Berry ML, Ward-Bailey PF, Greenstein I, Byers C, Czechanski A, Sharp J, Palmer K, Gudis P, Martin W, **Tadenev A**, Bogdanik L, Pratt CH, Chang B, Schroeder DG, Cox GA, Cliften P, Milbrandt J, Murray S, Burgess R, Bergstrom DE, Donahue LR, Hamamy H, Masri A, Santoni FA, Makrythanasis P, Antonarakis SE, Shendure J, and Reinholdt LG (2015). Exome sequencing reveals

pathogenic mutations in 91 strains of mice with Mendelian disorders. *Genome Res* 25(7):948-57. doi: 10.1101/gr.186882.114.

Tadenev ALD, Garrett AM, Burgess RW. (2013) The role of Dscams in the neural development of the retina and visual system. *The New Visual Neurosciences*. Werner JS & Chalupa LM (Eds). MIT Press.

Garrett AM, **Tadenev ALD**, Burgess RW. (2012) DSCAMs: restoring balance to developmental forces. *Front Mol Neurosci* 5:86. doi: 10.3389/fnmol.2012.00086.

Burgess RW, Garrett AM, **Tadenev ALD**. (2012) Contact is repulsive, but please note the "enclosed". *Dev Cell*. 22(1):5-6. doi: 10.1016/j.devcel.2011.12.017.

Davisson MT, Bronson RT, **Tadenev ALD**, Motley WW, Krishnaswamy A, Seburn KL, Burgess RW. (2011) A Spontaneous Mutation in Contactin 1 in the Mouse. *PLoS ONE* 6(12): e29538. doi: 10.1371/journal.pone.0029538.

Tadenev ALD, Kulaga HM, Katsanis N, Reed RR. (2011) Loss of Bardet-Biedl syndrome protein-8 (BBS8) perturbs olfactory function, protein localization, and axon targeting. *PNAS*. 108(25):10320-5. doi: 10.1073/pnas.1016531108.

Gary DS, **Davidson A**, Milhavet O, Slunt H, Borchelt DR. (2007) Investigation of RNA interference to suppress expression of full-length and fragment human huntingtin. *Neuromolecular Med*. 9(2):145-55. doi: 10.1007/BF02685888.

Zimmerberg B, Kim JH, **Davidson AN**, Rosenthal AJ. (2003) Early deprivation alters the vocalization behavior of neonates directing maternal attention in a rat model of child neglect. *Ann N Y Acad Sci*. 1008:308-13. doi: 10.1196/annals.1301.039.

Conference Presentations

Tadenev ALD, Nick Devaney N, Michel Cayouette M, Tarchini B. Ground Control of Stereocilia Elongation during Hair Cell Differentiation. Gordon Research Conference: The Plastic and Dynamic Auditory System, Lewiston, ME, July 2016.

Tadenev ALD, Lopez GC, Wray A, Fuerst PG, Burgess RW. The role of DSCAMs in neurodevelopment and visual function in the mouse. Development, Functions and Disorders of the Nervous System: Joint Meeting of NeuroDevNet and the International Society for Developmental Neuroscience, Montreal, Canada, July 2014.

Tadenev ALD, Fuerst PG, Lopez GC, Burgess RW. The role of DSCAMs in visual function in the mouse. FASEB SRC: Retinal Neurobiology and Visual Processing, Steamboat Springs, CO, July 2012 (Abstract selected for "data blitz" presentation).

Tadenev AL & Reed RR. Olfactory phenotypes of *Bbs8*-null mice. Keystone Symposium: Cilia, Signaling and Human Disease, Monterey, CA, February 2010 (Abstract selected for platform presentation).

Davidson AL & Reed RR. Olfactory phenotypes of *Bbs8*-null mice. International Symposium on Olfaction and Taste, San Francisco, CA, July 2008.

Teaching Experience

September 2016	Researched, developed materials for, and taught a class on electron microscopy for the study of the inner ear as part of The Jackson Laboratory's course The Mouse as an Instrument for Ear Research.
Summer 2014	Developed materials for and educated local children during a Science Outreach event at the Jesup Memorial Library in Bar Harbor, Maine
Spring 2014	Teaching Assistant for Genetics II course at The Jackson Laboratory.
January 2013	Taught a section of Bard College's <i>Citizen Science</i> course to a group of 20 first-year undergraduates. This entailed selecting materials, designing the curriculum, and over 60 hours of instruction time.
2005-10	Developed materials for and taught inner-city elementary school students during annual Johns Hopkins Basic Sciences Community Science Day Program.
Fall 2004	Tutored peers in Molecular Biology as part of the Pollard Scholars program, The Johns Hopkins University School of Medicine.
2001	Teaching Assistant in Physiology, Williams College.
2000-2001	Peer Tutor in Multivariable Calculus, Williams College.

Mentoring Experience

Summer 2017	Mentored a Worcester Polytechnic Institute freshman, Kate Romero, during The Jackson Laboratory's Summer Student Program. Miss Romero optimized a new assay allowing for the analysis of protein-protein interactions by imaging transport of fluorescently tagged proteins to the filopodia of cultured cells.
Summer 2014	Mentored a Bowdoin College freshman, Allyson Fulton, during The Jackson Laboratory's Summer Student Program. Miss Fulton performed behavioral phenotyping to explore whether <i>Dscam</i> mutant mice model human autism.
2013-2014	Mentored a Mount Desert Island high school junior, Anita Wray, in her internship. Miss Wray performed behavioral experiments to assess vision and social behavior in mutant mouse strains.
2012-2013	Mentored a Mount Desert Island high school junior, Luke Krebs, in his internship. Mister Krebs used histological techniques to examine peripheral nerves in a mouse model of Charcot-Marie-Tooth disease.
Summer 2012	Mentored a Connecticut College freshman, Gabriela Lopez, during The Jackson Laboratory's Summer Student Program. Miss Lopez studied the effects of mutations in <i>Dscam</i> on vision in mice.
2011-2012	Mentored a Mount Desert Island high school senior, Mia Musetti, in her internship. Miss Musetti studied the retinal phenotypes of High Stepper, a spontaneous mouse mutant discovered at The Jackson Laboratory.
Summer 2011	Mentored a Colby-Sawyer College freshman, Courtney Hanley, during The Jackson Laboratory's Summer Student Program. Miss Hanley sequenced candidate genes in an attempt to identify the causative mutation in the High Stepper mouse, a spontaneous mutant mouse.

Other Service

April 2012-2015

F1000Prime Associate Faculty Member. Provided regular reviews of current literature to the F1000Prime website.