

Andrew Vincent Taibi

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Education:

Current: August 2013 – present; Ph.D. Neuroscience, School of Medicine, University of Utah, Salt Lake City, UT.

Advisor: Dr. Jason Shepherd

Co Advisor: Dr. Erik Jorgensen

M.S.: December 2012; Biochemistry & Cell Biology, Stony Brook University, New York

Advisor: Dr. Bernadette Holdener

B.S.: May 2009; Biology, Stony Brook University, New York

Publications:

Research Papers

Monestime C.M., **Taibi, A.V.**, Gates K.P., Jiang, K., Sirotkin, H.I. (2019) CoRest1 regulates neurogenesis in a stage-dependent manner. *Developmental Dynamics*. Doi: 10.1002/dvdy.86. [In Press]

Pastuzyn, E.P., Day, C.E., Kearns, R.B., Kyrke-Smith, M., **Taibi, A.V.**, McCormick, J., Yoder, N., Belnap, D.M., Erlendsson, S., Morado, D.R., Briggs, J.A.G., Feschotte, C., Shepherd, J.D. (2018) The neuronal gene arc encodes a repurposed retrotransposon gag protein that mediates intercellular RNA transfer. *Cell* 172(1-2): 275-288.e18.

Jenks, K., Kim, T., Pastuzyn, E.D., Okuno, H., **Taibi, A.V.**, Bito, H., Bear, M.F., Shepherd, J.D. (2017) Arc restores juvenile plasticity in adult mouse visual cortex. *PNAS* 114(34): 9182-9187.

Duncan, R., Xie, Y., McPherson, A.D., **Taibi, A.V.**, Bonkowsky, J.L., Douglass, A.D., Dorsky, R.I. (2016) Hypothalamic radial glia function as self-renewing neural progenitors in the absence of Wnt/ β -catenin signaling. *Development* 1;143(1):45-53.

Taibi, A.V., Mandavawala, K.P., Noel, J., Okoye, E.V., Milano, C.R., Martin, B.L., and Sirotkin, H.I. (2013) Zebrafish *churchill* regulates developmental gene expression and cell migration. *Developmental Dynamics* 6:614-621.

Taibi, A.V., Lighthouse, J.K., Grady, R.C., Shroyer, K.R., Holdener, B.C. (2013) Development of a conditional Mesd (mesoderm development) allele for functional analysis of the low-density lipoprotein receptor-related family in defined tissues. *PLoS One* 8(10):e75782.

Kok, F.O., **Taibi, A.V.**, Wanner, S.J., Xie, X., Moravec, C.E., Love, C.E., Prince, V.E., Mumm, J.S., Sirotkin, H.I. (2012) Zebrafish *rest* regulates developmental gene expression but not neurogenesis. *Development* 139: 3838-48.

Conference Posters

Taibi, A.V., Shepherd, J.D. "The lost Arc of protein trafficking and release from neurons during plasticity." Janelia Junior Scientist Protein Engineering Workshop. May 19th 2019.

Taibi, A.V., Jorgensen, E., Shepherd, J. "Nanometer resolution imaging of Arc-mediated endocytosis." Gordon Research Conference: Synaptic Transmission. August 14th 2016.

Taibi, A.V., Jorgensen, E., Shepherd, J. "Nanometer Resolution Imaging of Arc-Mediated Endocytosis." Society for Neuroscience Annual Conference. Oct 18th 2015.

Taibi, A.V., Leonard-Melief, C., Vasudevan, D., Grady, R.C., Apte, S.S., Haltiwanger, R.S., Holdener, B.C. "Regulation of Epithelial to Mesenchymal transition by O-fucosylation of the Thrombospondin Type 1 Repeat (TSR) Superfamily". Annual Meeting of the Northeastern Society for Developmental Biology. April 19th 2013.

Kok, F., **Taibi, A.V.**, Wanner, S., Xie, X., Moravec, C., Love, C., Prince, V., Mumm, J., and Sirotkin, H., "Zebrafish rest regulates developmental gene expression but not neurogenesis." 10th International Conference on Zebrafish Development and Genetics. Madison, WI. June 23rd 2012.

Taibi, A.V., Leonard-Melief, C., Holdener, B., and Haltiwanger, R., "Do Geleophysic Dysplasia mutations affect glycosylation and secretion of ADAMTSL2?" Stony Brook Third Annual Retreat. Stony Brook University, Dept of Biochemistry and Cell Biology. May 22nd 2012.

Mandavawala, K., Noel, J., Mullings, O., **Taibi, A.V.**, and Sirotkin, H. "Gene targeting of the zebrafish Churchill gene using zinc finger nucleases". URECA's celebration of undergraduate research, Stony Brook University, Poster presentation. April 25th 2012.

Ibrahim, A., **Taibi, A.V.**, and Sirotkin, H., "Application of the Reporter Gene system in examining the role of RE-1 Silencing Transcription Factor (REST)" URECA's celebration of undergraduate research, Stony Brook University, Poster presentation. April 28th 2010.

Honors and Awards:

2008 Stony Brook University Dean's List

2008 Charles M. Stewart, M.D. Memorial award for leadership in Adapted Aquatics

2009 Dana Bregan & Brian Berman Memorial award for excellence in Adapted Aquatics

2010 Stella Angelo Memorial award for a "Stellar" performance in Adapted Aquatics

Current Research:

(March 2014 – Present). Shepherd Lab/Jorgensen Lab, University of Utah, UT. **Generation of Modular genetic system for reporting and manipulating synaptic activity without disrupting whole-cell or network activity.** I am currently investigating the nature of synapse-specific neuronal communication through the development of a novel system for localizing experimentally functional proteins to distinct

active synapses. The design of the system involves the incorporation of regulatory elements and genetically encoded targeting to endogenous proteins to investigate synapse-specific plasticity. The use of this genetically encoded targeting system will allow the mapping of the experience dependent development of cortical circuits *in vivo*. Equipment used includes: Nikon A1 Confocal Microscope, antibodies, lentivirus, primary neuronal cell culture, standard molecular biology equipment.

(March 2014 – Present). Shepherd Lab/Jorgensen Lab, University of Utah, UT **Assessment of Arc/Arg3.1 mediated AMPAR and membrane trafficking during LTD**. I am currently investigating the role of Arc in membrane dynamics and AMPA receptor organization/endocytosis during long term depression (LTD) in hippocampal neurons. I am also using single molecule tracking fluorescence microscopy to determine what proteins play a role in AMPA receptor organization and endocytosis during LTD. Equipment used includes: Vutara SR-350 fPALM microscope, Nikon A1 Confocal Microscope, antibodies, HALO/SNAPtag dyes (Lavis Lab, Janelia Farms), standard tissue culture facility/equipment, standard molecular biology equipment.

Completed Research:

(September 2016 – January 2018). Shepherd Lab, University of Utah, UT **Arc capsids transfer RNA to naïve cells**. Cell-to-cell communication via secreted extracellular vesicles (exosomes) is known to facilitate endogenous signaling and homeostasis as well as viral pathogenesis. Recently, the Shepherd Lab uncovered a novel role for Activity Regulated Cytoskeletal Protein (Arc) in interneuronal transfer of mRNA mediated by Arc protein released from neurons. My role was primarily to determine how Arc interacts with mRNA using quantitative techniques. I also designed, executed, and taught colleagues similar assays needed to determine specificity of Arc-RNA interactions using mouse brains and purified protein preparations.

(September 2016 – February 2017). Shepherd Lab, University of Utah, UT. **Arc restores juvenile plasticity in adult mouse visual cortex**. Cortical circuit development follows an established genetic program but is also regulated by experience. Arc is a known effector protein responsible for transducing experience into plasticity. In this study, we investigated the role of Arc in facilitating juvenile-like plasticity in visual cortical circuits. My role was to analyze the induction of Arc expression in juvenile and adult mouse visual cortices in both wild-type and transgenic backgrounds by qPCR.

(May 2009 – August 2012). Sirotkin Lab, Stony Brook University, NY **Analysis of Rest mediated transcriptional repression of neural and pan-neural gene expression in zebrafish**. Rest is a known, key regulator of central nervous system development in vertebrates. In order to study the specificity of Rest in regulating gene expression through development, I had utilized a targeted zinc finger nuclease mediated knockout of transcriptional repressor *rest/nrsf* in developing and adult zebrafish for gene expression analysis. I analyzed pan-neural gene expression and cell migration using qPCR, *in situ* hybridization, enhancer trap transgenic lines, and several other available as well as novel transgenic reporter lines.

(June 2011 – December 2012). Sirotkin Lab, Stony Brook University, NY **Analysis of Churchill, chch, mediated regulation of Transforming Growth Factor β , TGF β , and Fibroblast Growth Factor, FGF, signaling in early development**. Early development is guided by numerous signaling pathways that direct cell differentiation in an orchestrated way. In order to study the interaction between FGF and TGF β in directing early development, I had generated several knockout lines using targeted zinc finger nuclease mediated gene editing. This was followed by use of qPCR, *in situ* hybridization, cell transplants,

and transgenic reporter lines to analyze cell migration and expression of salient FGF and TGF β target genes during very early zebrafish development.

Additional Select Completed Research:

Sirotkin Lab, Stony Brook University, NY (January 2012 – August 2013). **Characterization of Rest/Nrsf regulation of *Snap25a* expression in adult zebrafish.**

Holdener Lab, Stony Brook University, NY (February 2012 – December 2012). **Development of conditional knockout line for functional analysis of Low-Density Lipoprotein Receptor Related Proteins, LRP6, *in vivo*.**

Haltiwanger Lab, Stony Brook University, NY (February 2012 – December 2012). **Studying the effect of disease mutations on fucosylation and secretion of ADAMTSL2.**

Sirotkin Lab, Stony Brook University, NY (May 2008 – December 2008). **Application of GAL4-UAS based reporter system to elucidate role of RE1-Silencing Transcription Factor (*Rest*) in early development.**

Teaching Experience:

2014 Molecular Biology Bootcamp (*Laboratory graduate course*), University of Utah, Neuroscience Program. Teaching Assistant for Dr. Megan Williams (course director), Dr. Megan Williams (instructor), and Dr. Yukio Saijoh (instructor).

2014 Cellular and Molecular Neuroscience (*Didactic graduate course*), University of Utah, Neuroscience Program. Teaching Assistant for Dr. Ning Tian (course director).

Academic Service:

University of Utah Neuroscience Graduate Program

2018 – present Lasso Center Associate. New Venture Development Fellow.

2013 – present Department Recruitment Committee. Student Host.

Assist Faculty Admissions committee to host potential neuroscience program students.

2013 – present Brain Awareness Week Committee. K12 Outreach facilitator.

Promote science education to elementary and high school students and teachers.

2016 – 2018 Neuroscience Program Directorate Committee, Student representative.

2015 – 2016 Public Relations Committee, Student Chair.

2015 – 2016 Seminar Series Committee, Seminar organizer.

2016 – 2017 Student Advisory Committee, Chair for faculty tenure review process.

2016 – 2017 Salt Lake City Brain Bee. High school neuroscience exam author and proctor.