

Alondra Schweizer Burguete, PhD

CURRICULUM VITAE

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EDUCATION

M.Sc. 1994-1998 Lund University, Department of Molecular Genetics, Sweden.
Dip. 1997-1998 Lund Graduate School of Biomedical Research, Swedish Foundation for Strategic Research.
Ph.D. 2000-2006 Stanford University School of Medicine, Biochemistry Department, USA. Field: Membrane Traffic. Advisor: Suzanne R. Pfeffer.

RESEARCH POSITIONS

1998-2000 Research Assistant, Departments of Clinical Genetics and Neurobiology, Lund University, Sweden. Field: Fusion Oncogenes, and GPCR Discovery. Advisors: Pierre Åman and Christer Owman.

2006-2008 Postdoctoral Associate, Howard Hughes Medical Institute, Stanford University, USA. Field: Structural Biology. Advisor: Axel T. Brunger.

06/2009-03/2017 Postdoctoral Fellow, University of Pennsylvania, Biology Department, and Howard Hughes Medical Institute. Field: Repeat RNA Toxicity in Neurodegenerative Disease, and *Drosophila* Models for Microsatellite Expansion Disorders. Advisor: Nancy M. Bonini.

09/2017-present Officer, Associate Research Scientist, Taub Institute for Research on Alzheimer's Disease and the Aging Brain, Columbia University.

RESEARCH

Ph.D. work was with Suzanne Pfeffer in Biochemistry at Stanford University. A method to predict and select surface residues that mediate protein:protein interactions was developed, and selected affinity-altered mutant proteins were assayed for their function in living cells. The interactions between a Rab GTPase and a Golgin, two key players in a vesicle trafficking pathway, were characterized and the studies were extended to an atomic level with Axel Brunger, also at Stanford University. A structure-derived model that explains how Rab and Arf-family members may interact with the same binding partner at different distances from the cell membrane was generated. In addition, the first-ever instance of a cooperative relationship between different GTPase family members in directing incoming vesicles to the Golgi membrane prior to fusion, was described.

Postdoctoral work was on the mechanisms behind microsatellite repeat expansion disorders, with Nancy Bonini in Biology at the University of Pennsylvania. Using cell biological and genetic tools at subcellular resolution, we surprisingly found that expanded repeat RNA, linked to

ALS/FTD, Huntington's disease, and the Myotonic Muscular Dystrophies is incorporated into neuritic ribonucleoprotein particles in mammalian primary spinal cord neurons, as well as in induced pluripotent stem cell-derived neurons from expansion carriers. The disease-associated repeats function as RNA localization signals: they assemble into RNA/protein granules that undergo transport into distal segments of neurites, and furthermore, neuritic localization of expanded repeat RNA correlates with loss of primary arbors. The establishment of *Drosophila* models for repeat RNA toxicity in sensory neurons allowed the identification of striking dendritic arborization defects, and mRNP components were identified as strong modifiers of the expanded GGGGCC repeat-induced phenotype. The human homologues of these modifiers (FMRP, CPEB3, as well as FMRP targets, e.g. PSD-95) were shown to be upregulated in human GGGGCC expansion carrier-derived iPSCs, suggesting disrupted local translational regulation. These findings indicate transport granule dysfunction as a novel disease mechanism that may contribute to microsatellite expansion disorder.

AWARDS, FELLOWSHIPS AND HONORS

2015	Carl Storm Underrepresented Minority Fellowship
2015	Travel Award from the organizing committee of the EMBO RNA Conference on Localization and Local Translation.
2010	The Ruth L. Kirschstein National Research Service Award, National Institute for Neurological Disorders and Stroke, Percentile: 12.0.
2009	Training grant, appointment from T32 "Training in Age-Related Neurodegenerative Diseases", by Dr. Virginia M.-Y. Lee.
2008	Faculty of 1000, Associate Faculty Member with Frederick M. Hughson, Princeton University, NJ.
2000-01, 2001-02	The Foundation BLANCEFLOR Boncompagni-Ludovisi, née Bildt Fellowship, award with one year of competitive renewal.
2000-2001	The Sweden-America Foundation Fellowship.
2000	Fulbright Fellowship (declined due to repatriation restriction).
1996, 1997, 1998	Lund University, Biochemistry Department Fellowship, competitively awarded each year.

INVITED SPEAKER

2016	Indiana University School of Medicine, Indianapolis, IN.
2015	EMBO Conference, RNA Localization and Local Translation, Hersonissos, Greece.
2015	EMBO/EMBL Symposia, Mechanisms of Neurodegeneration, Heidelberg, Germany, (flashtalk).
2015	Gordon Research Conference, Triplet Repeat Disorders, Lucca, Italy.
2015	Gordon Research Seminars, Triplet Repeat Disorders, Lucca, Italy.
2015	Ronald M. Loeb Center, Icahn School of Medicine at Mount Sinai, NY.
2014	MRC Laboratory of Molecular Biology, Cambridge, UK.
2014	ICM Brain and Spine Institute, Paris, France.
2013	Max Planck Institute for Biology of Ageing, Cologne, Germany.
2013	Cold Spring Harbor Meeting, Neurobiology of <i>Drosophila</i> , NY.
2013	Cold Spring Harbor Meeting, Eukaryotic mRNA Processing, NY.

- 2011 The 11th Annual Marian S. Ware Neurodegenerative Diseases Research Retreat, University of Pennsylvania, Philadelphia, PA.
- 2011 Center for Neurodegenerative Disease Research, University of Pennsylvania, Philadelphia, PA.

ORAL PRESENTATIONS

- 2007 Stanford University Molecular and Cellular Physiology Departmental Research Conference, “Dual GTPase Regulation of the GCC185 Golgin: Communication between adjacent Rab6 and Arl1 binding sites”, Monterrey, CA.
- 2007 Stanford University Structural Biology Departmental Research Conference, “Dual GTPase Regulation of the GCC185 Golgin: Communication between adjacent Rab6 and Arl1 binding sites”, Asilomar, CA.
- 2002 and 2004 Stanford University Biochemistry Departmental Research Conference, “Structural Analysis of TIP47 by Misincorporation Proton-Alkyl Exchange”, Lake Tahoe, CA.

POSTER PRESENTATIONS

- 2015 EMBO Conference, RNA Localization and Local Translation, Hersonissos, Greece.
- 2015 EMBO/EMBL Symposia, Mechanisms of Neurodegeneration, Heidelberg, Germany.
- 2013 The 13th Annual Marian S. Ware Neurodegenerative Diseases Research Retreat, “Localization of Microsatellite Repeat RNAs”, University of Pennsylvania, Philadelphia, PA.
- 2013 The 23rd European *Drosophila* Research Conference, “Localization of Microsatellite Repeat RNAs”, Barcelona, Spain.
- 2012 The 7th International Conference on Unstable Microsatellites and Human Disease, Mont Ste Odile, Strasbourg, France.
- 2011 Gordon Research Conference, Triplet Repeat Disorders, Lucca, Italy.

INDEPENDENT COURSE WORK

- 2013 Leadership in Bioscience, Cold Spring Harbor Laboratory, NY.
- 2010 Neurobiology of *Drosophila*, Cold Spring Harbor Laboratory, NY.

MENTORING EXPERIENCE

- 05-07, 2013 Josh Black, University of Pennsylvania Senior Undergraduate, Bioengineering Major, supervised research project.
- 2011-2013 Rosaline Zhang, University of Pennsylvania Undergraduate, supervised research project.
- 05-07, 2011 Samantha Maliha, University of Pennsylvania Undergraduate, supervised research project.

LANGUAGES Spanish, Swedish, and English. (French; 7th grade – end of high school)

MATERNITY 2011 and 2014

LIST OF PUBLICATIONS

1. **Burguete, A.S.***, Almeida S., Gao F.B., Kalb R., Akins M., Bonini N.M.* (2015) GGGGCC repeat RNA is neuritically localized, induces branching defects, and perturbs transport granule function. *eLife*, 2015;10.7554/eLife.08881

***co-corresponding authors**

Featured in:

Amber Dance (2016) Repeat RNAs hitchhike to ends of neurons, attacking neurites (2016) *ALZFORUM* <http://www.alzforum.org/news/research-news/repeat-rnas-hitchhike-ends-neurons-attacking-neurites>

2. **Burguete, A.S.**, Fenn, T.D, Brunger, A.T., Pfeffer, S.R. (2008) Rab and Arl GTPase family members cooperate in the localization of the Golgin GCC185. *Cell* 132 (2): 286-298.

Featured in:

Emily J. Chenette (2008) Membrane trafficking: GTPases stack up. *Nature Reviews Molecular Cell Biology* 9:266-267.

Richard Robinson (2008) Reach out and gRab something. *J Cell Biol.* 180(4): 651.

Stanford Collaboration Reveals a Case of Microscopic Teamwork. (2008) *SLAC Today* <http://today.slac.stanford.edu/feature/2008/cell.asp>

GTPase Family Proteins Show Microscopic Teamwork. (2008) *SSRL Science Highlight* http://www-ssrl.slac.stanford.edu/research/rab-arl_gtpases_summary.html
http://www-ssrl.slac.stanford.edu/research/highlights_archive/rab-arl_gtpases.html

3. Reddy, J.V., **Burguete, A.S.**, Sridevi, K., Ganley, I.G., Nottingham, R., Pfeffer, S.R. (2006) A functional role for the GCC185 golgin in mannose 6-phosphate receptor recycling. *Mol. Biol. Cell.* 17(10):4353-4363.
4. **Burguete, A.S.**, Sivars, U., Pfeffer S. (2005) Purification and analysis of TIP47 function in Rab9-dependent mannose 6-phosphate receptor trafficking. *Methods Enzymol.* 403:357-366.
5. **Burguete, A.S.**, Harbury, P.B., Pfeffer., S.R. (2005) Misincorporation Proton-Alkyl Exchange (MPAX): Engineering Cysteine Probes into Proteins. *Current Protocols in Protein Science*, John Wiley & Sons, Inc. Unit 26:1.
6. **Burguete, A.S.**, Harbury, P.B., Pfeffer., S.R. (2004) *In vitro* selection and prediction of

TIP47 protein-interaction interfaces. *Nature Methods* 1:55-60.

7. Challa, A., Eliopoulos, A.G., Holder, M.J., **Burguete, A.S.**, Pound, J.D., Chamba, A., Grafton, G., Armitage, R.J., Gregory, C.D., Martinez-Valdez, H., Young, L.S., Gordon, J. (2002) Population depletion activates autonomous CD154 -dependent survival in biopsylike Burkitt lymphoma cells. *Blood* 99(9):3411-3418.
8. Thelin-Jarnum, S., Goransson, M., **Burguete, A.S.**, Olofsson, A., Aman, P. (2002) The myxoid liposarcoma specific TLS-CHOP fusion protein localizes to nuclear structures distinct from PML nuclear bodies. *Int. J. Cancer* 97(4):446-450.
9. Arnason, U., Gullberg, A., **Burguete, A.S.**, Janke, A. (2000) Molecular estimates of primate divergences and new hypotheses for primate dispersal and the origin of modern humans. *Hereditas* 133(3):217-228.