

Curriculum Vitae of Alexandra Whiteley (Greer)

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Education

Ph.D., Biomedical Sciences Ph.D. Graduate Program, University of California, San Francisco
2008-2013

B.S. Biology, *Cum Laude, Phi Beta Kappa*, Davidson College, Davidson NC
2004-2008

Academic Appointment

Jan 2020 - Assistant Professor, Department of Biochemistry, University of Colorado Boulder

Postdoctoral Research

Harvard Medical School, Boston, 2016-2019

- Advisor Dr. Daniel Finley PhD, Professor of Cell Biology
- Identified new clients of UbqIn2 in mouse models of ALS-FTD and developed Dendra2 assay

Genentech, Inc., South San Francisco, 2014-2016

- Advisor Dr. Eric Brown MD, Vice President of Infectious Disease and Immunology
- Discovered a new role for UbqIn1 in B cell proliferation and identified mislocalized mitochondrial proteins as dominant client proteins of UbqIn1

Graduate Research

University of California, San Francisco, 2008-2013

- Advisor Dr. Jeoung-Sook Shin PhD, Associate Professor of Microbiology and Immunology
- Thesis Title: REGULATION AND FUNCTION OF FC ϵ RI ON HUMAN DENDRITIC CELLS

Awards and Fellowships

Harvard Medical School Hearst Fund Award (2016)

Cancer Research Institute Irvington Postdoctoral Fellowship (2016-2019)

UCSF Graduate Student Research Award (2012)

UCSF HHMI Graduate Education in Medical Sciences (GEMS) Training Program Fellowship (2011-12)

NIH T-32 AI007334 Molecular and Cellular Immunology Predoctoral Fellowship NIAID (2009-2011)

Professional Memberships and Activities

2023 – present Mentored member, University of Colorado Cancer Center
2020 – present Member, *American Society for Cell Biology (ASCB)*

2020 – 2023

Affiliate member, University of Colorado Cancer Center

Patents

- (2023) PCT Patent Application #PCT/US23/84278: The use of RTL8-deficient cells as a means of producing biocompatible, PEG10-derived virus-like particles for mRNA vaccine delivery
- (2023) Provisional US Patent Application: The use of anti-retroviral protease inhibitors for the treatment of Amyotrophic Lateral Sclerosis
- (2022) US Patent Application #17/822,992: Methods and Compositions for the treatment of UBQLN2-mediated Amyotrophic Lateral Sclerosis (ALS)
- (2021) Provisional US Patent Application: The use of PEG10 inhibitors to treat ALS
- (2021) US-11059872-B2: Self-assembly of protein-based biomaterials with multiple morphologies

Honors

- National Science Foundation Graduate Research Fellowship Program Honorable Mention (2009-2011)
- Phi Beta Kappa (2008)
- Davidson College Sigma Xi Biology Research Award (2008)

Teaching Experience

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| 2022 | BCHM-5781 Advanced General Biochemistry II |
| 2021 | BCHM-5781 Advanced General Biochemistry II |
| 2020 | BCHM-5781 Advanced General Biochemistry II (guest lecturer) |

Publications

- Campodonico, W., Black, H.H., Lau, C.I., **Whiteley, A.M.** The gag-like gene RTL8 antagonizes PEG10-mediated virus like particles in humans. *BioRxiv* [preprint] February 4, 2023 [cited April 3, 2023]. Available from doi: 10.1101/2023.02.03.527044.
- Black, H.H., Roberts, J.E., Leslie, S.N., Campodonico, W., Ebmeier, C.E., Lau, C.I., **Whiteley, A.M.** (2022) UBQLN2 restrains the domesticated retrotransposon PEG10 to promote neuronal health in ALS. *eLife*, 2023 Mar 23;12, pii:e79452. PMID: PMC10076021.
- Whiteley, A.M.***, Prado, M.A.*, de Poot, S.A.H., Paulo, J.A., Ashton, M., Dominguez, S., Weber, M., Syzpyt, J. Jedrychowski, M.P., Easton, A., Hegde, R.S., Gygi, S., Kurz, T., Monteiro, M.J., Brown, E.J., Finley, D. (2020) Global proteomics of Ubqln2-based murine models of ALS. *Journal of Biological Chemistry* 296: 100153.
- Wu, J.J., Cai, A., Greenslade, J.E., Higgins, N.R., Fan, C., Le, N.T.T., Tatman, M., **Whiteley, A.M.**, Prado, M.A., Dieriks, B.V., Curtis, M.A., Shaw, C.E., Siddique, T., Faull, R.L.M., Scotter, E.L., Finley, D., Monteiro, M.J. (2020) ALS/FTD mutations in UBQLN2 impede autophagy by reducing autophagosome acidification through loss of function. *PNAS* 117 (26): 15230-15241.
- Whiteley, A.M.**, Prado, M.A., Peng, I., Abbas, A.R., Haley, B., Paulo, J.A., Reichelt, M., Katakam, A., Sagolla, M., Modrusan, Z., Lee, D-Y., Roose-Girma, M., Kirkpatrick, D. S., McKenzie, B.S., Gygi, S.P., Finley, D., Brown, E.J. (2017) Ubiquilin1 promotes antigen-receptor mediated proliferation by eliminating mislocalized mitochondrial proteins. *eLife* 6: e26435.
- Shin, J.S., and **Greer, A.M.** (2015) The Role of FcεRI expressed in dendritic cells and monocytes. *Cellular and Molecular Life Sciences* 72 (12): 2349-2360. (REVIEW)
- Greer, A.M.**, Matthay, M.A., Kukreja, J., Bhakta, N.R., Nguyen, C.P., Wolters, P.M., Fahy, J.P., Woodruff, P., Fahy, J.V., Shin, J.S. (2014) Accumulation of myeloid DCs in inflammatory diseases of the lung. *PLoS One* 9 (6):e99084.

- Greer, A.M.**, Wu, N., Putnam, A., Woodruff, P.W., Kinet, J.P., Shin, J.S. (2014) FcεRI expressed in human dendritic cells and monocytes mediates cellular entry of circulating IgE contributing to serum IgE clearance. *The Journal of Clinical Investigation* 124 (3): 1187-1198.
- Baravalle, G., **Greer, A.M.**, LaFlam, T., Shin, J.S. (2014) Antigen-conjugated human IgE induces antigen-specific T cell tolerance in a humanized mouse model. *The Journal of Immunology* 192 (7): 3280-3288.
- Waterfield, M., Khan, I.S., Cortez, J.T., Fan, U., Metzger, T., **Greer, A.M.**, Fasano, K., Martinez-Llordella, M., Pollack, J.L., Erle, D.J., Su, M., Anderson, M.S. (2014) The transcriptional regulator Aire coopts the repressive ATF7ip-MBD1 complex for the induction of immunotolerance. *Nature Immunology* 15 (3): 258-265.
- Greer, A.M.**, Huang, Z., Oriakhi, A., Lu, Y., Lou, J., Matthews, K.S., and Bondos, S.E. (2009) "The *Drosophila* transcription factor Ultrabithorax self-assembles into protein-based biomaterials with multiple morphologies". *Biomacromolecules* 10(4):829-37.

Invited Seminars

- 2023 Uniformed Services University Medical School, Department of Molecular and Cellular Biology, Bethesda MD
Colorado School of Mines, Department of Chemistry, Golden CO
- 2021 University of Utah, Department of Biochemistry, Salt Lake City UT
Regis University, Department of Biology, Denver CO
- 2019 Johns Hopkins SOM, Dept of Molecular Biology and Genetics, Baltimore MD
Vanderbilt University Medical Center, Depts of Pathology, Microbiology and Immunology and VI4, Nashville TN
University of Colorado Boulder, Depts of Biochemistry and MCDB, Boulder CO
Medical Research Council, Protein Phosphorylation and Ubiquitination Unit, Dundee UK
University of California Los Angeles SOM, Dept of Biological Chemistry, LA CA
University of Massachusetts Amherst, Dept of Biochem and Molecular Bio, Amherst MA
- 2018 Medical Research Council, Protein Phosphorylation and Ubiquitination Unit, Dundee UK

Meetings – oral presentations

- "Exploring the role of a proteasome shuttle factor in ALS" Colorado Proteinopathy Symposium, Denver CO (2023)
- "Probing a new model of UBQLN-dependent protein degradation" *Keystone Ubiquitin Biology and Disease*, Keystone CO (2023)
- "Regulation and role of the domesticated retrotransposon, PEG10, in Amyotrophic Lateral Sclerosis (ALS)" *Keystone Transposable Elements Conferences*, Whistler Canada (2023)
- Whiteley, A.M.**, Prado, M.A., Paulo, J.A., Gygi, S.P., Hegde, R.S., Kurz, T., Monteiro, M.J., Brown, E.J., Finley, D. "Correlating proteomic and RNASeq datasets from human ALS samples to identify targets uniquely altered at the protein level." *New York Genome Center Symposium*, New York (2018).
- Greer, A.M.**, Abbas, A., Peng, I., Roose-Girma, M., Brown, E.J. "Ubiquilin 1 is uniquely required for cell cycle entry and proliferation downstream of B-cell receptor signaling." *Keystone Ubiquitin Conference*, Whistler Canada (2016).
- Greer, A.M.**, Wu, N., Putnam, A.L., Woodruff, P.W., Shin, J.S. "Constitutive IgE endocytosis via human trimeric high affinity IgE receptor and its implication in serum IgE clearance." **UCSF Immunology Retreat*, Asilomar CA (2010), and *International Symposium on Dendritic Cells*, Daegu South Korea (2012).

Awarded Research Support

NIH NINDS R01 NS131660 Whiteley (PI) 04/23-3/28
Investigation of UBQLN2-dependent changes to neuronal health and function in ALS-FTD
The goal of this award is to examine the etiology of UBQLN2-mediated ALS-FTD with a focus on the activities of PEG10 on neuronal health and function.
Role: PI

CU Lab Venture Challenge: Proof of Concept Whiteley (PI) 05/22-04/24
PEG10 inhibitors for the treatment of Amyotrophic Lateral Sclerosis
The goal of this award is to identify small molecule inhibitors of PEG10 enzymatic activity for the treatment of ALS.
Role: PI

Strategic Initiative, The ALS Association Whiteley (PI) 12/22-11/24
Shining a light on the dark proteome: investigating retroelements in ALS
This award supports projects in the laboratory examining how retroelement proteins contribute to ALS.
Role: PI

CU TORI/Cancer Center Pilot Award Whiteley (Co-PI) 1/23-12/24
Investigating UBQLN1-mediated retroelement degradation in lung cancer outcomes
This award supports projects in the laboratory that examine UBQLN1's role in lung cancer
Role: Co-PI (Merrick, CU Anschutz)

University of Colorado Boulder Startup Funds Whiteley (PI) 01/20-
The goal of this award is to support the Alexandra Whiteley Laboratory with initial funds for equipment, consumables, and personnel costs.
Role: PI

Completed Research Support

CU Core Facility Assistance Grant Whiteley (Co-PI) 09/22-08/23
Upgrading instrumentation in the Flow Cytometry Shared Facility in JSCBB with a high-throughput sampler
This award goes towards the purchase of an HTS plate reader for the flow cytometry core BD Celesta.
Role: Co-PI (Nahreini and Liu, CU Boulder)

Core Facility Voucher Program Whiteley (PI) 09/21-08/22
Cell culturing and flow cytometry for the investigation of UBQLN function
This award goes towards the use of core facilities for laboratory investigation.
Role: PI