Alejandro Scaffa

Updated: March 2018

CONTACT INFORMATION

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INTERESTS

Research, clinical science, startups, high throughput biology, CRISPR, and physiology.

EDUCATION

Brown University, Providence, Rhode Island USA — expected: Dec 2019
Ph.D. Candidate, Molecular Pharmacology and Physiology

- Dissertation Topic:"The effect of senescence in the neonatal lung exposed to hyperoxia"
- Adviser: Prof. Phyllis Dennery M.D.

M.A., Molecular Pharmacology and Physiology — May 2016

Grinnell College, Grinnell, Iowa USA — May 2014
B.A. with honors, Biochemistry

Danish Institute for Study Abroad (DIS), Copenhagen, Denmark — Aug-Dec 2012
Visiting Student - Biomedicine Semester Abroad

HONORS AND AWARDS

Best Aging in Place Hack, MIT Hacking Medicine Grand Hack, Cambridge, MA 2016

Pharmacology Pre-Doctoral Fellow, Brown University, Providence, RI 2015

1st Prize in Biochemistry, Best in Category, and naming rights of a minor planet, Intel International Science and Engineering Fair (ISEF) co-hosted by Google, San Jose, CA 2010

CURRENT RESEARCH

The effect of Senescence in Neonatal Lung Exposed to Hyperoxia P.I.: Dr. Dennery
If a premature child reaches the age of 38 weeks still needing supplemental oxygen (hyperoxia), they are diagnosed with bronchopulmonary dysplasia (BPD). A chronic lung disorder causing damaged alveoli, severe lung development issues, and even neurological complications. My goal is to study the role of senescence in the neonatal lung's response to hyperoxia, with attention to metabolic shifts.

PAST RESEARCH

Understanding the effect of Splicing in Autism Spectrum Disorders (ASD) - P.I.: Dr. Fairbrother:
I used computational biology techniques, high throughput splicing assays, and CRISPR aimed to characterize pre-mRNA splicing abnormalities on mutations relevant to ASD.

Optimizing expression, purification, and refolding of the MqsR toxin from Y. pestis and P. fluorescens in E. Coli - P.I.: Dr. Page:
We aimed to purify and refold MqsR, the toxin to antitoxin MqsA, acquired from inclusion bodies in E.Coli in order to obtain large amounts for structural analysis.

Elucidating the structure of mutant Protein Tyrosine Phosphatase 1B (PTP1B) using X-Ray Crystallography and NMR - P.I Dr. Peti:
We elucidated the structure of the PTP1B with mutation Y152A/Y153A using X-Ray Crystallography after optimization to obtain better crystals.

Determining the structure of the N-terminal domain (NTD) of TAR DNA-binding protein 43 (TDP-43) and the effect of phosphorylation on its assembly - P.I.: Dr. Fawzi:

Past Research Continued

We studied how phosphorylation and point mutations affect TDP-43's monomeric/oligomeric equilibrium in order to stabilize the NTD monomeric form and solve it via NMR.

Improving purification of Torpedo nicotinic acetylcholine receptor (nAChR) for LC-MS Studies - P.I.: Dr. Levandoski and Dr. Marzluff
Improved purification of nAChR for better LC-MS sample preparation and eventual characterization. Also used voltage clamp techniques to study changes in nAChR to mutations in Xenopus oocytes. Research done throughout academic year and one full-time summer

Publications, Abstracts, and Presentations

Scaffa A. (review) "CRISPR Precision Gene Editing Congress Post Event Report". CRISPR Congress 2016.

Scaffa A., Glidden, D., Soemedi R., Fairbrother W. (abstract) "Engineering splicing mutations in HEK 293 cells using CRISPR/Cas9 system". Genome Engineering: The CRISPR/Cas Revolution, Cold Spring Harbor Laboratories 2015.

Scaffa A. and Page R. (presentation) "Elucidating the structure of Protein Tyrosine Phosphatase 1B YAYA". First Year Talk, Brown University 2015.

Scaffa A., Levandoski M., Marzluff E. (abstract and presentation) "Elucidating the allosteric binding site of nicotinic acetylcholine receptors via liquid chromatography mass spectrometry". Midstates Conf. for Math and Science, U. of Chicago 2013.

Skills

Programming Languages: Python, Julia, Unix, and basic knowledge of HTML/CSS

Languages: Fluent: English, Portuguese, Spanish; basic knowledge of Bulgarian and Danish

Laboratory: Experience with NMR, X-Ray Crystallography, LC-MS, protein purification, DNA manipulation, E. Coli expression, western blots, senescence, developmental lung, voltage-clamp, frog surgery, splicing assays, CRISPR, scientific writing and scientist to layman communication.

Teaching Experience

Effective Performance: Improv. and Performance Techniques Brown University **2018**

Certificate I: Sheridan Teaching Seminar - Reflective Teaching, Brown University **2015**

Brazilian Portuguese Curriculum Developer, Grinnell College **Jan 2013 - May 2014**
Developed a teaching guide and a syllabus for Portuguese courses and online tests.

Biochemistry (BCM 262) Teaching Assistant, Grinnell College **Aug - Dec 2013**
Held mentor sessions and provided support to Dr. Elizabeth Trimmer during all class sessions.

General Chemistry (CHM 129) Laboratory Assistant, Grinnell College **Jan - May 2013**
Helped Dr. Trimmer by enforcing laboratory safety, explaining procedures, and grading students.

Brazilian Portuguese I and II Instructor, Grinnell College **Aug 2011 - Jun 2012**
Created syllabus and developed dynamic presentations about Portuguese language and culture.

Community Involvement

Department Representative, Brown University **Oct 2015 - Present**

Class Representative of Psychopharmacology, DIS, Copenhagen **Aug 2012 - Dec 2012**

Leader on the Internat. Pre-Orientation Program, Grinnell College **Aug 2011 - Oct 2011**

Relevant Coursework

Brown University
- Biomolecular Interactions
- Molecular Pharmacology and Physiology
- Quantitative Approaches to Biology
- Molecular Targets of Drug Discovery
- Computational Molecular Biology

Grinnell College
- Intro to Biochemistry
- Physical Chemistry
- Bioorganic Chemistry
- Advanced Genetics