Alejandro Scaffa

CONTACT ME

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PROFILE

Molecular pharmacologist, physiologist, and biochemist. Excited to work on biomedical innovation, drug discovery and development, oncology, rare disorders, biotech, data science, and exciting problems. Studied how supplemental oxygen (hyperoxia), which is a needed treatment for the survival of premature infants, leads to senescence and metabolic dysregulation.

EDUCATION

Brown University, Providence, Rhode Island, USA
Ph.D., Molecular Pharmacology and Physiology **expected: May 2020**

- Dissertation:"Hyperoxia leads to Senescence and Glycolytic Dysregulation in Alveolar Type II lung cells, a model for Bronchopulmonary Dysplasia"
- 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

CURRENT RESEARCH

Effect of Hyperoxia-induced Senescence in Lung Epithelial Cells - P.I.: Prof. Dennery MD
Severely premature infants are treated with lifesaving supplemental oxygen (hyperoxia). Yet, this hyperoxia may create lung injury leading to bronchopulmonary dysplasia (BPD), a chronic lung disorder characterized by disrupted normal lung development, preventing proper blood oxygenation. I aim to describe mechanisms leading to hyperoxia-induced senescence (a cellular response to stress) in lung epithelial cells and its connection to metabolism in the lung after trauma. I enjoy using technology to improve my research efficiency, for example I collaborated with a computer scientist to develop a segmentation and immunofluorescence quantification program for cell image analysis.

PAST RESEARCH

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 later characterization. Also used voltage clamp techniques to study changes in nAChR to mutations in *X. laevis*' oocytes.

Studying the effect of Splicing in Autism Spectrum Disorders - 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.

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.

SKILLS

Languages: Fluent: English, Portuguese, and Spanish. Basic knowledge of Bulgarian

Research: Problem solving, literature search, experimental design, scientific communication, CRISPR, cell culture, Seahorse Bioanalyzer, Metabolism, E. Coli, western blots, senescence, FACS, developmental lung, Genomics, RNA-sequencing. Experience with X-Ray Crystallography, and LC-MS.

Entrepreneurship: Startups, pitch and deck development, market research, and product dev.

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

Publications, Presentations, and Abstracts

Scaffa A., Peterson, A., Yao, H., Dennery, P. (paper) "Single cell RNA-seq of mouse lungs exposed to hyperoxia as a model for BPD: postnatal day 7 and 60" [in preparation].

Scaffa A., Peterson, A., Dennery, P. (paper) "Hyperoxic exposure leads to metabolic dysregulation and p53 dependent senescence in Type II-like mouse epithelial cells" [in preparation].

Scaffa A Peterson, A., Dennery, P. (abstract) "Hyperoxic Exposure Increases Senescence In Type II-like MLE-12 cells: Role Of p53 Signaling" - American Thoracic Society Meeting 2019.

Dennery P., Peterson, S. Bullock, **Scaffa A.** (abstract) "Hyperoxia Leads to Early Senescence in Neonatal Lungs and Lung Epithelial Cells: Consequences for Alveolar Simplification" - ATS 2019.

Scaffa A Peterson, A., Dennery, P. (abstract and presentation) "Hyperoxic exposure causes senescence in type II-like mouse lung epithelial cells" - Pediatric Academic Society Meeting 2019.

Scaffa A. (review) "CRISPR Gene Editing Congress 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., Levandoski M., Marzluff E. (abstract and presentation) "Elucidating the allosteric binding site of nicotinic acetylcholine receptors via liquid chromatography mass spectrometry" - Midstates Conference for Math and Science, University of Chicago 2013.

Previous Experience

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 Prof. Trimmer Ph.D. during all class sessions.

General Chemistry (CHM 129) Laboratory Assistant, Grinnell College Jan - May 2013
Helped Prof. Trimmer Ph.D. by helping with laboratory safety, protocols, and grading.

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

President of SACNAS, Brown University Jul 2018 - Jun 2019

Department Representative, Brown University Oct 2015 - May 2017

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

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

Honors and Awards

Google Developer Challenge Scholarship, Google and Udacity 2018

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 2010
Intel® International Science and Engineering Fair (ISEF) co-hosted by Google, San Jose, CA

Certifications

Python for Data Science and AI, Coursera. Credential ID DWD5P77TUVQV. 2019

Data Science Methodology, Coursera. Credential ID SBNE8F872BV9. 2019

Open Source Tools for Data Science, Coursera. Credential ID FCHSVSEM8DY2. 2019

What is Data Science?, Coursera. Credential ID 2M5FJFSVQQ4U. 2019

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

Teaching Certificate I, The Sheridan Center for Teaching and Learning. Brown University. 2016