ALLISON MARIE BURNS

PhD, Bioinformatician and Genomicist

I am a bioinformatician and scientist with more than 8 years of experience working with NGS datasets. I am passionate about using multi-omics approaches to explore the genetics of diseases and to develop novel therapeutics to ameliorate those disorders. My motivation is to leverage my skills as part of a team to successfully conduct and communicate data-drive research.

⚒ EXPERIENCE

2022 | 2016

Doctoral Researcher and Bioinformatician
Laboratory of Neuroepigenetics - Gräff Lab   📍 EPFL
- Integrated multi-omics datasets to determine mechanisms of HDACi treatment in memory amelioration
- Designed, performed and analyzed molecular and bioinformatic experiments
- Created and managed analysis pipelines for myself and colleagues
- Advised colleagues on best methods for NGS sample and library preparation
- Maintained and organized computational storage needs for the lab

2016 | 2013

Bioinformatician / Research Associate
Baumann Laboratory   📍 Stowers Institute for Medical Research
- Analyzed RNA-seq data and performed transcriptome assembly with Trinity
- Performed basic tissue culture and molecular experiments

2012 | 2010

Undergraduate Researcher
Bradshaw-Holzapfel Laboratory   📍 University of Oregon
- Measured animal fitness in extreme light environments
- Studied the evolutionary divergence of circadian clock genes in mosquitos

🎓 EDUCATION

2022

Ph.D. in Neuroscience
Lausanne, Switzerland   📍 École Polytechnique Fédérale de Lausanne

Title: Epigenetic memory aids: Synaptic and molecular effects of HDAC inhibition that support memory formation

2013

M.Sc. in Bioinformatics
Eugene, Oregon, USA   📍 University of Oregon

Title: Effects of the splicing inhibitor, Isoginkgetin, on human Telomerase RNA

2012

B.Sc. in Biology
Eugene, Oregon, USA   📍 University of Oregon

Project: Evolutionary genetics of geographical variation, seasonal development and circadian timing in the North American mosquito species, Wyeomyia smithii

CONTACT INFO

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- in allisonmburns

PERSONAL DATA

- 🎂 DOB: April 12, 1990
- 🌐 Nationality: USA
- 🏠 Current: Switzerland

LANGUAGES

English (Native)
French (A2)
German (A1)

📈 TECHNICAL SKILLS

Bioinformatics and NGS Data Analysis
• R/Bioconductor (highly proficient), Bash (proficient), Python (competent)
• Data wrangling, statistical analysis, and data visualization in R (tidyr, dplyr, ggplot, etc)
• Quality control and processing of sequencing data (FastQC, STAR alignment, Bowtie suite, CellRanger, etc)
• Analysis and integration of RNA-seq (edgeR, DESeq2), scRNA-seq (Seurat, RNAvelocity) and ChIP-seq (DiffBind)
• Exploration and interpretation of complex omics datasets (BiomaRt, Gprofiler2, TopGO, Cytoscape, etc)
• Ability to link transcription and epigenetic data analysis to behavioral phenotypes

Computing Experience
• Version control with git and Github
• Software download and maintenance (conda, homebrew, etc)
• Experience using cloud computing and high performance clusters for analysis and storage of large datasets

Communication
• Documentation with Rmarkdown (Pagedown and KnitR), Emacs Org Mode and Jupyter Notebooks
• Presenting and communication (Microsoft Office and Adobe Suite) with scientists in my field and unrelated fields
• Excellent written communication in the form of manuscript and thesis writing
• Website development (R Blogdown and Wordpress with basic markdown and HTML)

Laboratory Techniques
• Techniques for NGS experimentation (nuclear and RNA extractions, ChIP, library preparation, etc)
• Molecular Biology Techniques (FANS, Western, qPCR, etc)
• Animal Handling (mouse and insect)

✳ COURSES AND TRAINING

2022 **Genome variant analysis**
Swiss Institute of Bioinformatics

2021 **Scientific writing for biomedical articles**
École Polytechnique Fédérale de Lausanne

2020 **Advanced topics in single-cell transcriptomics**
Swiss Institute of Bioinformatics

2019 **Genetic and epigenetic mechanisms underlying brain disorders**
FENS-Hertie Winter School 2019

2018 **Science and Engineering Teaching and Learning**
CAPE-Teaching Support Centre, EPFL

2016 **Image Processing for Life Scientists**
École Polytechnique Fédérale de Lausanne

2016 **High Performance Computing (HPC) in Life Sciences**
Swiss Institute of Bioinformatics

📖 TEACHING AND MENTORING

2019 — **Robust data analysis: an introduction to R**
Designed and taught introduction to R in an afternoon lecture 📍 Open Science in Practice Summer School

2017-21 — **Project Supervisor for Bachelor Students**
Mentored students for projects (3wks - 1yr) involving lab techniques and bioinformatic analysis 📍 EPFL

2017-19 — **Laboratoire Intégré en Sciences de la Vie I/II**
Taught and demonstrated lab techniques and analysis to first year bachelor students 📍 EPFL

🖥 SELECTED PRESENTATIONS

2020 — **Federation of European Neuroscience Society Forum 2020 (virtual poster)**
Testing the theory of Epigenetic Priming in Fear Memory Conditioning 📍 Glasgow, Scotland

2019 — **FENS-Hertie Winter School 2019 (poster)**
Testing the theory of Epigenetic Priming in Fear Memory Conditioning 📍 Obergurgl, Austria

2019 — **Society For Neuroscience Annual Meeting 2019 (poster)**
Testing the theory of Epigenetic Priming in Fear Memory Conditioning 📍 Chicago, Illinois, USA

2019 — **Molecular and Cellular Cognition Society 18th Annual Meeting (talk)**
Testing the theory of Epigenetic Priming in Fear Memory Conditioning 📍 Chicago, Illinois, USA

2019 — **Single Cell Biology Symposium (talk)**
Variations of epigenetic priming across hippocampal cell types during memory formation 📍 Lausanne, Switzerland

2019 — **Lemanic Neuroscience Annual Meeting (poster)**
Testing the theory of Epigenetic Priming in Fear Memory Conditioning 📍 Diableret, Switzerland

2018 — **Neural Circuits and Behavior (talk)**
HDAC inhibitors that prime in fear memory conditioning 📍 Lausanne, Switzerland

2018 — **Federation of European Neuroscience Society Forum 2018 (poster)**
Epigenetic Priming and Fear Memory Conditioning 📍 Berlin, Germany

2018 — **Functional Genomics Symposium (talk)**
Epigenetic priming in fear memory conditioning 📍 Lausanne, Switzerland

📄 PUBLICATIONS

2021 — **The HDACi inhibitor CI-994 acts as a molecular memory aid by enhancing synaptic and intra-cellular communication after learning**
Allison M. Burns, Mélissa Farinelli-Scharly, Sandrine Hugues-Ascery, Jose Vicente Sanchez-Mut, Giulia Santoni,Johannes Gräff
BioRxiv

2021 — **A thalamo-amygdalar circuit underlying the extinction of remote fear memories**
Bianca A. Silva, Simone Astori, Allison M. Burns, Hedrik Heiser, Lukas van den Heuvel, Giulia Santoni, Maria Fernanda Martinez-Reza, Carmen Sandi, Johannes Gräff
Nature Neuroscience

2020 — **Cognitive epigenetic priming: Leveraging histone acetylation for memory amelioration**
Allison M. Burns, Johannes Gräff
Current Opinion in Neurobiology

2018 — **A cFos activation map of remote fear memory attenuation**
Bianca A. Silva, <u>Allison M. Burns</u>, Johannes Gräff
Psychopharmacology

2015 — **Human Telomerase RNA Processing and Quality Control**
Chi-Kang Tseng, Hui-Fang Wang, <u>Allison M. Burns</u>, Morgan R. Schroeder, Martina Gaspari, Peter Baumann
Cell Reports

⚙ LEADERSHIP AND OUTREACH

2019-22 — **Pint of Science**
Webmaster (https://pintofscience.ch/)

2019 — **EDNE Neuroscience Student Association**
Event Organizer

2018-21 — **R-Ladies Lausanne**
Member

2018-21 — **Letters to a Pre-scientist**
STEM Professional

2018-20 — **Association of Doctoral Students in Life Sciences (ADSV)**
Webmaster & Head of Coaches