

# Benjamin Mark Lewis

## Curriculum Vitae

### Professional Experience

#### Bioinformatics Scientist II, Research and Development April 2024 - Present

Actio Biosciences – San Diego, CA

- Primary focus: biomarker discovery and new target triage through analysis of omic datasets
- Single-cell and bulk transcriptomics: project design and data analysis lead
- Developed a bottom up RNAseq analysis pipeline using nextflow and python, achieving 2 day TAT for deliverables

#### Scientist I, Research and Development March 2022 – March 2024

Aspen Neuroscience – San Diego, CA

- Single-cell transcriptomics/multiomics: project design and data analysis lead
- Functional genomics for pipeline development: project design and data analysis lead
- Cross-functional role bridging wet lab and dry lab
- Assisted in both preclinical and IND-enabling studies

#### Research and Development Intern June 2013–December 2013

Hardy Diagnostics, Santa Maria, CA

- Designed and developed chromogenic diagnostic media formulations
- Wrote and performed protocols for 510k validation studies

### Education

#### Ph.D. in Molecular Biology 2022

University of California, San Diego, CA.

- Co-advisors: Dr. Tony Hunter and Dr. Gene Yeo
- Thesis project focus: Bioinformatic analysis of RNA-binding proteins and mitochondrial biology

#### M.S. in Biology, Specialization: Stem Cell Research and Technology 2015

#### B.S. in Biochemistry and Microbiology (Double Major) 2013

California Polytechnic State University, San Luis Obispo, CA

### Key Qualifications and Skills

- Multiomic data analysis – Single cell multiomics | Transcriptomics, Proteomics, ATAC-seq, CLIP-seq
- Bioinformatics and statistical analysis | Predictive machine learning model design and implementation
- Coding skills – Python, pandas, matplotlib/seaborn, scikit-learn, scanpy/adata, scvi-tools, PyTorch
  - Linux, AWS, Cloud/High-performance computing environments, Github, R
  - IBM Data Science Professional Certificate | IBM AI Engineering Professional Certificate
- Molecular Biology – Viral vector design/production | Gene cloning and DNA assembly techniques
- Gene expression analysis – NGS/qPCR| RNA manipulation and analysis techniques | Immunoblotting
- Cell Culture – CRISPR/Cas9 gene-editing in iPSCs & cell lines | Stem cell-based disease modeling
- Cellular Analysis – Extracellular flux analysis | Flow cytometry techniques and analysis (FACS) | Live Cell imaging
- Immunofluorescence microscopy – Confocal, Brightfield, Plate scanner

### Publications

*“LARP4 Is an RNA-Binding Protein That Binds Nuclear-Encoded Mitochondrial mRNAs To Promote Mitochondrial Function”*

- **Benjamin M. Lewis**, Chae Yun Cho, Hsuan-Lin Her, Orel Mizrahi, Gene W. Yeo, Tony R. Hunter
- RNA, November 2023

*“Autologous and Heterologous Cell Therapy for Hemophilia B toward Functional Restoration of Factor IX”*

- Suvasini Ramaswamy, Nina Tonnu, Tushar Menon, **Benjamin M. Lewis**, Kevin T. Green, Derek Wampler, Paul E. Monahan, Inder M. Verma
- Cell Reports, May 2018

*“Functional Gene Correction for Cystic Fibrosis in Lung Epithelial Cells Generated from Patient iPSC”*

- Amy L. Firth, Tushar Menon, Gregory S. Parker, Susan J. Qualls, **Benjamin M. Lewis**, Eugene Ke, Carl T. Dargitz, Rebecca Wright, Ajai Khanna, Fred H. Gage, Inder M. Verma
- Cell Reports, September 2015

*“Drosophila Muller F Elements Maintain a Distinct Set of Genomic Properties Over 40 Million Years of Evolution”*

- G3-Genes|Genomes|Genetics article, May 2015

## Research Training

### Ph.D. Student, UCSD Biology department

Summer 2015-March 2022

Laboratory of Tony Hunter (Co-Advisor) – Salk Institute, La Jolla, CA

Laboratory of Gene Yeo (Co-advisor) - University of California, San Diego, CA

- Ph.D. Project Focus: Post-transcriptional regulation of nuclear encoded mitochondrial mRNAs
- Analysis of CLIP data identified several RNA-binding proteins that bind nuclear encoded mitochondrial mRNAs
- Bioinformatic analysis to show LARP4 binds mRNAs encoding for OXPHOS and mito-ribosomal proteins
- Through quantitative proteomics showed that LARP4 depletion triggers reduction in protein levels of targets
- Functional cellular assays to demonstrate LARP4 contributes to mitochondrial function and homeostasis
- Developed methods to study localized translation at the surface of the mitochondria

### CIRM Bridges to Stem Cell Research Intern

July 2014 – March 2015

Laboratory of Inder M. Verma - Salk Institute, La Jolla, CA

Mentor and supervisor: Dr. Tushar Menon, Postdoctoral Researcher

- Completed several CRISPR genome-editing projects in iPSC cell models and in-vivo models
- Generated novel CRISPR-corrected hemophilia B patient derived iPSC lines: Published in Cell Reports
- Designed and constructed the several HDR targeting vectors the in-vitro/in-vivo correction of hemophilia B

### Undergraduate Student Research Assistant

January 2012–June 2013

Laboratory of Pat Fidopiastis- Cal Poly, San Luis Obispo, CA

Mentor and supervisor: Dr. Pat Fidopiastis, Professor

- Developed and performed agar plate based mucinase assay screens on a library of *V. fischeri* transposon mutants
- Performed bioinformatic screens secreted enzymes with potential activity on mucin molecules

## Posters

*“Proximity-labeling Based Methods for Studying Localized mRNA and Translation at the surface of the mitochondria”*

- **Lewis BM**
- Poster presented at the 2018 UCSD Biology Department retreat, Lake Arrowhead, USA

*“Genome Editing of Stem Cells to Brewing Yeast”*

- **Lewis BM**, Menon T, Black M, and Verma IM
- Poster presented at the 2015 CIRM Bridges Meeting, San Francisco, USA

*“Genomic Editing of Stem Cells for Modeling and Therapy of Monogenic Diseases”*

- Menon T, Firth AL, Parker GS, Gilmore WB, **Lewis BM**, Qualls SJ, Scripture-Adams D, Zack JA, and Verma IM
- Poster presented at the 2014 Meeting on the Mesa, The Salk Institute, La Jolla, USA

## Teaching Experience

**Discussion Section Instructor - “Our Energy Future”**

Spring 2019

**Discussion Section Instructor - “Computational Neurobiology”**

Spring 2018

**Lab Instructor - “Biochemical Techniques”**

Fall 2016

University of California, San Diego, CA

**Lab Instructor - “Introduction to Cell and Molecular Biology”**

Fall 2013

California Polytechnic State University, San Luis Obispo, CA

## Volunteer Service

**Science Fair Judge**

2019, 2021

Greater San Diego Science and Engineering Fair

- Volunteer judge for 7<sup>th</sup>-8<sup>th</sup> grade biology science fair projects

**Science Fair Mentor**

2015

San Luis Obispo Elementary Science Fair Mentor

- Volunteer mentor for 4<sup>th</sup> grade elementary student.

**References:** Available upon request

