RUI FU

RNA Bioscience Initiative, University of Colorado Anschutz Medical Campus

My research interests are in the various aspects of post-transcriptional gene expression regulation, particularly RNA degradation. Alongside 10 years of bench research experience, I have now worked 3 years in computational roles analyzing genomic and high throughput sequencing data.

CONTACT

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EDUCATION

2015 | 2009

Ph.D. Biological Science

University of California San Diego — La Jolla, CA, USA

2009 | 2005

B.S. Biological Science

Xiamen University — Xiamen, Fujian, China

RESEARCH EXPERIENCE

Current | 2017

Semi-Independent Informatics Fellow

Jay Hesselberth's Supervision — University of Colorado Anschutz

- Development of bioinformatics software packages
- RNA post-transcriptional dynamics modeling of steroidogenesis
- RNA-seq analysis and transcriptome annotation improvements for hibernating ground squirrel brain
- Collaboration on various RNA biology projects

2017 | 2016

Postdoctoral Research Fellow

Judy Lieberman's Lab — Harvard Medical School

- Identification of the mitochondrial trigger of apoptotic mRNA decay
- Purification of cytotoxic granules and key cytolytic proteins
- Mouse genetic manipulation by CRISPR-Cas9, and automated genotyping with custom R app

2015 | 2009

Graduate Research Assistant

Jens Lykke-Andersen's Lab — University of California San Diego

- Investigation of co-factors involved in ZFP36 (TTP)-mediated mRNA decay and translational repression during the immune response of macrophages
- Characterization of the ZFP36 family proteins in cell cycle progression regulation of mouse embryonic fibroblasts

2009 | 2007

Undergraduate Research Assistant

Ruichuan Chen's Lab — Xiamen University

- Exploration of cell cycle and apoptosis implications of the transcription elongation regulator HEXIM1
- Mechanistic characterization of p-TEFb activation by HIV-Tat

Bioinformatic tool development:

clustifyr, automated single cell RNA-seq cell identity assignment (author)

squirrelBox, RNA-seq data visualization, exploration, and analysis web browser built with R Shiny and JavaScript (author)

someta, quantification and monitoring of missing cell-level metadata in scRNA-seq GEO deposition (author)

valr, tidyverse-style genomic interval analysis (co-developer)

scraps, extraction of polyadenylation site info from scRNA-seq data (co-developer)

TEACHING EXPERIENCE

Current | 2020

Online Lecture Instructor (Graduate Level Courses)

University of Colorado Anschutz

- *Informatics and Statistics for Molecular Biology* (2020) - teaching and grading on RStudio Cloud platform
- *Foundations in Biomedical Sciences* (2020) - Zoom lecture, paper discussion, and exam/homework design on RNA biology
- *Workshop for scRNA-seq Data Analysis* (2020) - course development and online lectures

Current | 2018

Lecture Instructor (Graduate Level Courses)

University of Colorado Anschutz

- *Rigor in Research* (2020) - lecture on RNA sequencing
- *Foundations in Biomedical Sciences* (2018, 2019) - lectures, paper discussion, and exam/homework design on RNA biology
- *Practical Data Analysis with R/RStudio* (2018, 2019) - course development and lectures
- *Workshop for scRNA-seq Data Analysis* (2019) - course development and lectures

Current | 2018

Teaching Assistant (Graduate Level Courses)

University of Colorado Anschutz

- *Practical Computational Biology for Biologists: R* (2018, 2019)
- *Practical Computational Biology for Biologists: Python* (2018, 2019)
- Paper discussion for *Core Topics in Biomedical Sciences* (2018)

Current | 2017

Weekly RNA Bioscience Initiative Informatics Office Hour

University of Colorado Anschutz

- Guidance on RNA and computational research questions from students and researchers of CU Anschutz Medical Campus

2012 | 2011

Teaching Assistant (Undergraduate Level Courses)

University of California San Diego

- *Molecular Biology* (2012)
- *DNA Recombination Lab* (2011, 2012)

Additional pedagogy training through the Harvard Medical School Scientists Teaching Science Course

Developed computational biology course materials:

rnabioco.github.io/practical-data-analysis

rnabioco.github.io/cellar

MENTORING EXPERIENCE

Current | 2020

RNA Bioscience Initiative Internship Mentoring

University of Colorado Anschutz

- Mentoring of undergraduate computer science student, systemically exploring published scRNA-seq cell type signatures in the NCBI Gene Expression Omnibus
- Mentee's work was integrated into updates to R Bioconductor packages *clustifyr* and *clustifyrdatahub*
- Mentoring is continuing beyond summer intern period, now focusing on manuscript preparation, poster presentation, and further scRNA-seq software development

2017

Summer Research Mentoring

Harvard Medical School

- Mentoring of high school student enrolled in the MIT Research Science Institute program in tissue culture, RNA-related bench experiments, RNA-seq informatics analysis, and scientific writing

2015 | 2013

BS/MS Student Research Mentoring

University of California San Diego

- Mentoring of student research spanning undergraduate honor thesis and master thesis in biochemical investigations of RNA-binding protein functions
- Mentee was awarded Best Poster Presentation Award at 2014 UCSD Biological Sciences Annual Student Research Showcase
- Research project was integrated into the 2016 RNA manuscript, with mentee as second author

PUBLICATIONS, AS FIRST AUTHOR

2021

RNA-binding proteins regulate aldosterone homeostasis in human steroidogenic cells

Submitted to *Molecular Systems Biology*

- **Fu R**[1], Wellman K[1], Daigneault J, Hammer G, Rainey B, Riemondy K, Mukherjee N.

2021

A shifting balance between transcription and RNA stability shapes the dynamic liver transcriptome during hibernation

Submitted to *Frontiers in Physiology*

- Gillen A[1], **Fu R** [1], Riemondy K, Jager J, Fang B, Lazar M, Martin S.

2020

Inclusion of processed cell metadata improves single cell sequencing analysis reproducibility and accessibility

Submitted to *biorxiv* , Under review at *PLOS Biology*

- Puntambekar S, Hesselberth J, Riemondy K[c], **Fu R**[c].

Google Scholar:
tinyurl.com/googlescholar-rf

GitHub Projects:
github.com/rnabioco

squirrelBox Web App:
tinyurl.com/sqRNAbox

2020

Dynamic RNA regulation in the brain underlies physiological plasticity in a hibernating mammal

Frontiers in Physiology

• **Fu R**[†], Gillen A[†], Grabek K, Riemondy K, Epperson E, Bustamant C, Hesselberth J, Martin S.

2020

clustifyr: an R package for automated single-cell RNA sequencing cluster classification

F1000Research

• **Fu R**, Gillen A, Sheridan R, Tian C, Daya M, Hao Y, Hesselberth J, Riemondy K.

2018

PNPT1 release from mitochondria during apoptosis triggers decay of poly(A) RNAs

Cell

• Liu X[†], **Fu R**[†], Pan Y, Meza-Sosa K, Zhang Z, Lieberman J.

2016

Recruitment of the 4EHP-GYF2 cap-binding complex to tetraproline motifs of tristetraprolin promotes repression and degradation of mRNAs with AU-rich elements

RNA

• **Fu R**, Olsen MT, Webb K, Bennett E, Lykke-Andersen J.

PUBLICATIONS, AS CONTRIBUTING AUTHOR

2021

BTK signaling regulates real-time microglial dynamics and prevents demyelination in a novel in vivo model of antibody-mediated cortical demyelination

In prep for *Nature Medicine*

• Barr H, Given K, McClain C, Gruber R, Ofengeim D, **Fu R**, Macklin W, Bennett J, Owens G, Hughes E

2020

Srsf3 mediates alternative RNA splicing downstream of PDGFRa signaling

Submitted to *biorxiv* and *Developmental Cell*

• Dennison B, Larson E, **Fu R**, Mo J, Fantauzzo K.

2020

Molecular tracking devices quantify antigen distribution and archiving in the lymph node

Submitted to *biorxiv*, Revision at *eLife*

• Walsh S, Sheridan R, Doan T, Lucas E, Ware B, **Fu R**, Burchill M, Hesselberth J, Tamburini B.

2020 **Single-cell RNA sequencing identifies macrophage transcriptional heterogeneities in granulomatous diseases**

Revision at *American Journal of Respiratory and Critical Care Medicine*

- Liao S, Shaikh A, Konigsberg I, **Fu R**, Davidson E, Li L, Mould K, Fontenot A, Maier L, Yang I.

2019 **Monocytic Subclones Confer Resistance to Venetoclax-Based Therapy in Acute Myeloid Leukemia Patients**

Cancer Discovery

- Pei S, Pollyea D, Gustafson A, Stevens B, Minhajuddin M, **Fu R**, Riemondy K, Gillen A, Sheridan R, Kim J, Costello J, Amaya M, Inguva A, Winters A, Ye H, Krug A, Jones C, Adane B, Khan N, Ponder J, Schowinsky J, Abbott D, Hammes A, Myers J, Ashton J, Nemkov T, D'Alessandro A, Gutman J, Fesik S, Ramsey H, Savona M, Smith C, Jordan C.

2019 **Chronic Liver Disease in Humans Causes Expansion and Differentiation of Liver Lymphatic Endothelial Cells**

Frontiers in Immunology

- Tamburini B, Finlon JM, Gillen A, Kriss M, Riemondy K, **Fu R**, Schuyler R, Hesselberth J, Rosen H, Burchill M.

2019 **Single cell RNA Sequencing Identifies Transforming Growth Factor β as a Critical Regulator of Alveolar Regeneration**

JCI Insight

- Riemondy K, Jansing N, Jiang P, Redente E, Gillen A, **Fu R**, Anthony G, Hesselberth J, Zemans R.

2019 **Recovery and analysis of transcriptome subsets from pooled single-cell RNA-seq libraries.**

Nucleic Acid Research

- Riemondy K, Ransom M, Alderman C, Gillen A, **Fu R**, Finlay-Schultz J, Kirkpatrick G, Di Paola J, Kabos P, Sartorius C, Hesselberth J.

POSTERS AND TALKS

2021 **clustifyr2.0: leveraging GEO deposited single cell data for automated cell type classification**

Keystone eSymposia on Single Cell Biology (Poster)

2020 **Towards a comprehensive view of dynamic RNA regulation in hibernating 13-lined ground squirrel**

EMBL Conference, From Functional Genomics to Systems Biology (Poster)

2019 **ClustifyR: automated single-cell RNA sequencing cluster classification**

Keystone Symposia on Single Cell Biology (Poster)

2017 **PNPT1 release from the mitochondrial intermembrane space triggers rapid decay of mRNA and poly(A)-tailed ncRNA during apoptosis**
Boston Children's Hospital PCMM Research Poster Session (Poster)

2016 **PNPT1 release from the mitochondrial intermembrane space triggers rapid decay of mRNA during apoptosis**
Boston Children's Hospital PCMM Research Poster Session (Poster)

2015 **TTP-mediated mRNA repression involves recruitment of the 4EHP-GYF2 complex**
Cold Spring Harbor Laboratory mRNA Processing Meeting (Presentation)

2014 **TTP represses translation of target mRNAs through the 4EHP-GYF2 complex**
UCSD Mechanisms of Gene Expression Seminar (Presentation)

2013 **TTP family proteins regulate the stability of retinoblastoma protein mRNAs during serum-stimulated G_0-S transition**
Cold Spring Harbor Laboratory mRNA Processing Meeting (Poster)

2012 **The regulation of TTP family mRNA-decay factors during G_0-S cell cycle progression**
Keystone Symposia on Protein-RNA Interactions (Poster)

PROFESSIONAL SERVICE

Current | 2020 **Organizer for CU Anschutz Immuno-Informatics Joint Journal Club**

Current | 2019 **RNA Bioscience Initiative Grant Review**

Current | 2018 ***GENETICS* Early Career Reviewer (Cellular Genetics section)**
4 manuscripts reviewed for *GENETICS* and *G3*, tinyurl.com/rev-rf

Current | 2011 **Peer review of manuscripts under Dr Lykke-Andersen, Dr Lieberman, Dr Hesselberth**

2012 **Organizer for UCSD Ethics Center's Silent Spring (50th Anniversary) Project**

DIVERSITY, EQUITY, AND INCLUSION SERVICE

Current | 2020 **RNA Society Volunteer - Writer for Scientist Spotlight**

2021 **CU Anschutz Medical Campus Equity Certificate Program training**

2019 **Admissions Committee for CU Graduate Experiences for Multicultural Students**

Society memberships:

RNA Society

International Society for Computational Biology

Genetics Society of America

2019 — **Mentor for CU Anschutz and Denver Campus ISCORE (undergraduate mentorship program)**

RECOGNITION AND TRAINING

2018 — **BioFrontiers Hackathon**

2017 — **Data Incubator Data Science Fellowship**

2016 — **Grant writing training under Dr Lieberman**

2016 — **Harvard Medical School Scientists Teaching Science Course**

2011 | 2009 — **Dr Huang Memorial Scholarship, UC San Diego**

2009 | 2007 — **National College Students Creativity Experiment Project**

2008 | 2006 — **First-Class Scholarship**

2008 | 2006 — **XMU University Merit Student**

SCIENCE OUTREACH

2021 — **Volunteer for CU Anschutz Medical Campus Young Hands in Science Outreach Program**

2020 | 2019 — **Facilitator at Denver Museum of Nature and Science - Prehistoric Journey section**

~500 hours of weekend volunteering time logged

2017 | 2016 — **Visitor Education Volunteer at the New England Aquarium**

2016 | 2015 — **Information Ambassador at the San Diego Zoo**

Made with pagedown.

Code at github.com/raysinensis/cv.

Last updated on 2021-01-29.