

# Rays H.Y. Jiang

USF genomics, Global Health Infectious Disease Research Center (GHIDR), Department of Global, Environmental, and Genomic Health Sciences, College of Public Health, University of South Florida, Tampa FL USA

I am an interdisciplinary researcher with a translational focus on precision medicine, cancer metabolism, and host–microbe interactions. As founding leader of USF’s first Precision Medicine Program (CREATE), I have built cross-college infrastructure spanning omics, AI, and translational science. My lab discovered the original concept of *porphyrin overdrive*, a cancer-universal metabolic rewiring process now under patent review. I have led or co-led over 15 federally and state-funded projects, established the USF Genomics Graduate Program, and mentored students across public health, engineering, chemistry, and biomedical sciences. I am recognized as a Highly Cited Researcher by Clarivate, ranking in the **top 1% globally** by citations, with the additional distinction of high-impact contributions across multiple scientific fields. My publications include work in *Nature*, *Science*, and *Cell*.

## Pioneering in genomics

**As the founding PI of the first genomics laboratory** at the University of South Florida, I have played a central role in building USF’s genomics research ecosystem. My lab helped catalyze institutional capacity in high-throughput sequencing, single-cell biology, and computational genomics.

**I served as lead PI in securing major infrastructure**, including next-generation sequencing platforms and single-cell profiling systems, which laid the foundation for the USF Genomics Core.

**As a founding member of the USF Genomics Program**, I also launched and continue to direct the university’s first Genomics Master’s concentration. This interdisciplinary program provides hands-on training at the interface of biology, data science, and public health. Through these efforts, I have contributed to the transformation of omics research, education, and infrastructure at USF.

## Education

Wageningen University, the Netherlands	Biotechnology	Ing	2000
Wageningen University, the Netherlands	Genomics	PhD	2006
Virginia Tech USA, Broad Institute USA, Wageningen University, the Netherlands, Visiting scholar (Funded by Dutch genomics initiative NGI#050-72-404) 2006-2007			

## Appointments

**Associate Professor** 2020- current  
**(Currently tenured associate professor rank)**  
 College of Public Health, University of South Florida, FL, USA

**Assistant Professor** 2014-2020  
 College of Public Health, University of South Florida, FL, USA

**Research associate** 2012 - 2013  
 Department of Infectious Disease and Immunology, Harvard School of Public Health, Harvard University, MA, USA

**Computational biologist** 2008- 2013  
 Broad Institute of MIT/Harvard, MA, USA

## Languages:

**Human:** Chinese, Dutch, English

**Computational:** Python, Perl, PHP, Java, Javascript, R, SQL, noSQL

## Recent honors

**USF provost's CREATE award** on the first precision medicine program, 2024

**Dr. Moore Faculty Excellence Award**, Women in Leadership and Philanthropy, 2023

**Outstanding Faculty Award**, University of South Florida, 2020

## Professional activities

**USF Microbiome Institute Management Team, 2024-**

**Dissertation Committee University of Stockholm, Sweden 2023**  
 Department of Molecular Biosciences, The Wenner-Gren Institute, Sweden

**International Malaria database advisory committee 2017-**

**Faculty recruiting committee 2015 - current**  
 Public Health Genomics, College of Public Health, USF, Disease Biologist,  
 College of Arts and Sciences,

**Reading committee of PhD thesis 2013**  
 Theoretic biology and Bioinformatics at Utrecht University, the Netherlands

## Mentoring

I provide intensive, individualized mentorship as a major professor and PhD committee member across a wide range of disciplines, including *biomedicine, computational biology, engineering, chemistry, and public health*. My approach emphasizes scientific rigor, intellectual independence, and translational relevance. I have guided Honors students, MPH candidates, and international trainees through research projects, theses, and capstone experiences. Many of these students have gone on to co-author peer-reviewed publications, present at national conferences, and secure competitive placements in graduate programs, biomedical research institutes, and industry.

As a core mentor in the Moffitt–USF Odyssey Program, I work with exceptional undergraduates to develop their skills at the interface of medical biology, data science, and precision medicine. These early-stage scholars are integrated into active research projects in my lab, where they gain exposure to real-world biomedical challenges and cutting-edge genomic technologies. My mentorship also extends globally, including co-mentoring PhD students in Sweden and other European institutions.

## Teaching

### **Quantitative Genomics and Genetics (Course Director)**

Developed and launched this graduate-level course integrating classical genetics with advanced genomics technologies, including single-cell and spatial omics.

### **Antimicrobial Drug Discovery (Course Director)**

Co-developed and co-taught with the Departments of Chemistry and Global Health; focuses on translational drug discovery, from natural products to omics-guided therapeutic development.

### **USF Genomics Master's Program (Founding Concentration Director)**

I initiated and have led USF's first genomics and data science concentration within the MPH program, designed to bridge public health, molecular biology, and computational science. The program emphasizes interdisciplinary, hands-on training in high-dimensional biomedical data. In addition to curriculum development, I oversee mentoring, research integration, and workforce training, helping prepare students for translational careers in academia, industry, and public health innovation.

### **USF's First Hands-On Training Series in Cutting-Edge Omics (*Initiator and Supporter*)**

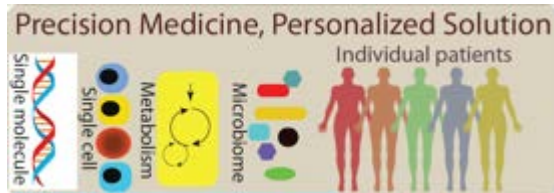
I initiated and continue to support USF's hands-on training series in advanced omics, offered through the USF Genomics Program's Sequencing and Computational Cores. The workshops—one focused on laboratory workflows and the other on computational analysis—provide researchers with expert-guided practical experience. Designed for both bench scientists and computational researchers, the program delivers comprehensive, end-to-end training and directly supports translational research development across the USF community.

## Organizing conferences and leadership in research programs



### USF Provost’s CREATE Award: Precision Medicine Program (2024–2027)

I serve as the founding leader of USF’s first high-profile Precision Medicine Program, launched through the Provost’s CREATE award. I initiated and currently direct this cross-college, interdisciplinary initiative, uniting faculty from medicine, public health, engineering, and life sciences to build a patient-centered research platform focused on chronic and metabolic diseases. Under my leadership, the program has rapidly expanded high-resolution multi-omics infrastructure. I have catalyzed multi-PI grant submissions, built collaborative bridges



from hospital-based clinical care to laboratory research, and led strategic efforts to secure external funding. The program now functions as a platform and interface for advancing precision health innovation at USF.

### Leading Ancient DNA and Pandemic Studies Collaboration Across Four Countries (2025)

I lead an international research collaboration focused on ancient DNA (aDNA) and pandemic studies, uniting researchers across four countries: the United States (USF and FAU), Australia, Jordan, and India. As project leader, I work alongside anthropologists, archaeologists, and geneticists to investigate the origins and spread of early pandemics. Our interdisciplinary team integrates archaeological context, pathogen genomics, and human genetic analysis to study the first recorded pandemic around 560 CE in Jordan and the earliest quarantine systems in Venice. This collaboration aims to uncover how infectious disease shaped human societies and to establish a global framework for paleogenomic research on historical pandemics.



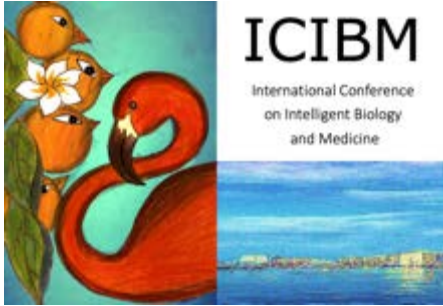
### Mentoring first MIT-VA Codeathon 2024

As a mentor for the inaugural MIT-VA Codeathon for Veterans' Health in 2024, I provided guidance and support to teams working on innovative solutions to improve the health and well-being of veterans. My role involved sharing expertise in genomics and public health, fostering collaboration, and helping participants refine their ideas to make a meaningful impact in the field of veterans' health.

### Inaugural Artificial Intelligence AI+X Symposium, Tampa, FL, 2023

I co-organized the first AI+X Symposium at USF, held in Tampa, FL, in 2023. This interdisciplinary event brought together experts from industry, academia, and clinical fields to explore the intersections of artificial intelligence with various domains,

including biosciences, engineering, and medicine. As the biosciences expert, I was responsible for organizing a full session dedicated to AI applications in biosciences, where I also delivered a presentation.



**International Conference of Intelligent Biology and Medicine (July, 2023, Tampa, FL)**

I co-organize this AI and biology conference, spanning field from computation, engineering and medicine. With invited speakers established in AI research and/or medical sciences.

**Florida Malaria winter club (March 2018, March 2022 USF)**

I co-organized the first malaria research network meeting at USF. Researchers from different institutions from Florida state actively participated and the club conference will continue on a yearly basis.



**Evolutionary System Biology group (Dec-2018 to current, USF)**

I am one of the initiators and organizers of the EvoSysBio group at USF. We have participants from all colleges of USF system and MOFFIT, a partner cancer institute in Tampa. We aim at bringing evolutionary strength to systems biology with quantitative calculations of populations dynamics and evolutionary processes. And we strive to offer concrete biological insight to ecological and population

research with mechanistic studies of cellular processes.

**American Microbiology Society Meeting (March 2018 St. Petersburg, FL, USA)**

I organized a session on eukaryotic pathogenesis, with invited speakers in different domains of parasitology research.

**Global Health and infectious disease symposium (March 2018, USF)**

I organized this symposium centering around cutting-edge technologies of single cell biology, featuring speakers specializing in cancer biology, mathematics, infectious diseases from different institutions and countries.

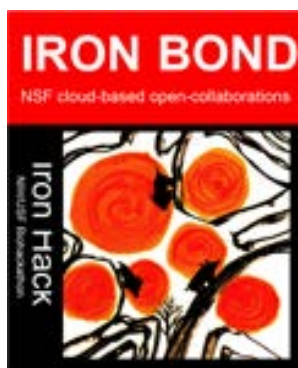
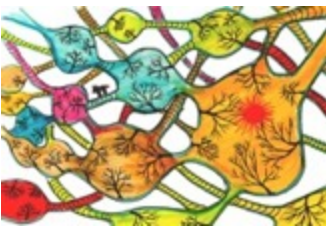
**Symposium cell-to-cell communications underlying malarial life cycle transitions (Oct-2018, New Orleans)**

I organized and chaired the symposium at the conference of American society of tropical medicine and hygiene, New Orleans, Louisiana USA. Established Speakers from 3 continents were invited to present their innovative research results.

**Collaborative coding against pandemics. (Feb-2021 virtual, USF).** In the midst of the COVID-19 pandemic, we organized a virtual workshop focused on collaborative data science solutions to urgent public health challenges. Within 12 months of the WHO's pandemic declaration, vast datasets had emerged to track pathogens, model outbreaks, and inform public response. Our event brought together interdisciplinary teams to rapidly prototype tools addressing these challenges. The workshop produced several functional prototypes and initiated new research collaborations during a critical period of global uncertainty.



**Uncovering host-microbiome interactions in global systems with collaborative programming: a novel approach integrating social and data sciences (Feb-2020 USF)** I organized the *OneHealth Codeathon*—an interactive, hands-on event aimed at solving real-world data challenges at the intersection of microbiology, public health, and computational science. The event brought together participants from the social sciences, data sciences, and biomedical fields to collaboratively explore host–microbiome interactions in global health contexts. This initiative led to the development of a manuscript and catalyzed new, independently funded research projects—particularly fostering novel collaborations between anthropology and microbiome research.



**Iron hack and Iron bond (Feb-2019, USF)** I co-organized the first NIH/NCBI/USF-sponsored biohackathon, *Iron Hack*, bringing together clinicians, researchers, genetic counselors, and programmers to develop innovative solutions to challenges in human genetic disease. This interdisciplinary event fostered cross-sector collaboration and launched *Iron Bond*, an ongoing initiative designed to build sustained research partnerships across disciplines, institutions, and countries. A peer-reviewed publication reporting on this effort has been published, and community-driven collaborations continue as a lasting outcome.

## Selected invited presentations

**Microbiome Institute Townhall, Tampa, FL.** *Beyond Bystanders: Uncovering the Microbiome's Role in Women's Cancers* — April 2025

**Moffitt–USF Collaborative Training Meeting.** *Unleashing Data Science Potential in Honors Students Through Real-World Training* — January 2025

**TGH–USF Collaboration Meeting, Tampa, FL.** *Uncovering the Microbiome–Environment Interface Shaping Tumor Metabolism* — November 2024

**USF Provost’s CREATE Symposium.** *The First Precision Medicine Program at USF* — December 2024

**MIT-USF collaborative meeting,** *Cross-Institutional Synergy* meeting of five labs with five PIs with diverse expertise in two universities. March-2024

**University of Stockholm, Sweden,** From parasites to tumors: exploring metabolic anomalies as therapeutic targets. Sep-2023

**Moffitt Cancer Institute, Tampa FL.** Precision targeting of novel cancer specific metabolism. August-2023

**Scuola Grande di San Marco, Venice, Italy.** “Tracking the First World Pandemic through Modern Genetics and Genomics Technology”. June 2023

**National Oceanographic and Atmospheric Administration (NOAA)|US department of Commerce** “The need for a bold step in US marine mammal management” (webinar). Feb-2023

**Johns Hopkins all children hospital, st Petersburg FL, USA.** “A double-edged sword: the role of heme in malaria infections”. March-2022

**Texas Wesleyan University, USA.** STEM research and career development workshop. (Virtual) Sep-2020

**Texas Tech, USA.** NSF workshop of Machine Learning and life sciences. Oct-2019

**Wageningen University, the Netherlands, genomics seminar.** July-2019

**Nijmegen University, the Netherlands – medical center seminar.** July-2019

**Oban, Scotland, UK – oomycetes molecular genetics.** July-2019

**USF, USA -** Artificial Intelligence and data science series. May-2019

**Oakland, CA, USA –** Gates foundation consortium meeting. March-1019

**New Orleans, USA –** American society of tropical medicine and hygiene. October-2018

**Exeter, UK –** University of Exeter, life sciences. July - 2018

**Osaka, Japan, -** Research Institute for Microbial Diseases. May-2018, Osaka University

**Tsukuba, Japan -** National Agriculture and Food Research Organization May-2018, NARO, Japan

**Athens, GA, USA** - Center for Tropical and Emerging Global Diseases, October-2017, University of Georgia

**Manaus, Brazil** - Gates Foundation liver stage malaria consortium meeting, June-2017

**Bangkok, Thailand** - Joint International Tropical Medicine Meeting, December-2016

**New York, USA** - Red Blood Cell club meeting, Feinstein Institute for Medical Research, October-2016

**Quito, Ecuador** - IV International meeting in infectious disease research and tropical medicine, June-2016

**Kolkata, India** - 17th All India Congress of Cytology and Genetics, December-2015

## Featured publications

The following publications have been highlighted by external publishers and scientific media outlets for their significance and impact in the field.

\*co-first authorship, ^co-senior authorship

Muneer A\*, Adapa SR\*, ... Adams JH, Kim K, Jiang RHY<sup>^</sup> and Cui L<sup>^</sup>.  
Autochthonous Plasmodium vivax Infections, Florida, USA, 2023.

**Emerging Infectious Diseases** 2024 PMID: 38662728

This work is featured by [the CDC \(Centers for Disease Control and Prevention\) on World Malaria Day.](#)

Zhang M\*, Wang CQ\*, Otto TD, Oberstaller J, Liao X, Adapa SR, Udenze K, Li S, Bronner IF, Casandra D, Mayho M, Brown J, Li S, Swanson J, Rayner JC, Jiang RHY<sup>^</sup> and Adams JH<sup>^</sup>.

Uncovering the essential genome of the human malaria parasite Plasmodium falciparum by saturation mutagenesis

**Science** 2018 PMID: 29724925

This work is featured by the [NIH Director's post](#)

Brancucci NMB, Gerdt JP, Wang C, ...Voss TS, Waters AP, Jiang RHY, Clardy J, Marti M. Lysophosphatidylcholine Regulates Sexual Stage Differentiation in the Human Malaria Parasite Plasmodium falciparum.

**Cell** 2017 PMID: 29129376

This work is featured in [a Nature Review Microbiology Commentary.](#)

## Genetics work with global press coverage

Adapa SR, Hendrix K, ... Tripathy S, Jiang RHY.  
Genetic Evidence of Yersinia pestis from the First Pandemic

**Genes** 2025 PMID: 40869973

Dutta S\*, Upadhyay A\*, ... Tripathy S, Jiang RHY.

Ancient Origins and Global Diversity of Plague: Genomic Evidence for Deep Eurasian Reservoirs and Recurrent Emergence.

**Pathogens** 2025 PMID: 40872307

*This work redefining the origins of the world's first pandemic has received global press coverage from major outlets including [The Independent](#), [Newsweek](#), [Discover Magazine](#), [IFLScience](#), [Economic Times](#), [Interesting Engineering](#), [EurekAlert!](#), [Archaeology Magazine](#), [Business Standard](#), [Times of India](#), [Euronews](#), and [NPR](#) etc. . It has been featured in multiple languages, including, such as [Kijk](#) (Dutch) and [cnBeta](#) (Chinese)*

## Rays Jiang Lab's Original Discovery in Cancer Metabolism

My lab has pioneered a new research direction in cancer metabolism, introducing the original concept of porphyrin overdrive—a cancer-universal, cancer-essential, and cancer-specific metabolic rewiring process. This discovery reveals a fundamental vulnerability in tumor bioenergetics and heme metabolism, offering a new avenue for therapeutic targeting across multiple cancer types. The work has resulted in a **cover story** of *Cancers* V17 I(19), a pending U.S. patent (**US Patent 1372.1312.US**)

Adapa SR, Hunter GA, Amin NE, Marinescu C, Borsky A, Sagatys EM, Sebti SM, Reuther GW, Ferreira GC, Jiang RHY

Porphyrin overdrive rewires cancer cell metabolism.

**Life Science Alliance** 2024 PMID: 38649187

Adapa SR, Meshram P, Sami A, Jiang RHY.

Harnessing Porphyrin Accumulation in Liver Cancer: Combining Genomic Data and Drug Targeting.

**Biomolecules**. 2024. PMID: 39199347

Adapa SR, Sami A, Meshram P, Ferreira GC, Jiang RHY.

Uncovering Porphyrin Accumulation in the Tumor Microenvironment

**Genes** 2024 PMID: 39062740

Kazi A, Xiang S, Yang H, Delitto D, Trevino J, Jiang RHY, Ayaz M, Lawrence HR, Kennedy P, Sebti SM.

GSK3 suppression upregulates  $\beta$ -catenin and c-Myc to abrogate KRas-dependent tumors.

**Nature Communications** 2018 PMID: 30514931



## Selected and recent publications

### Tissue, Organ Bioengineering, and Novel Omics

Co-Pioneered the development of minimal, optically accessible human liver tissue models capable of supporting complex metabolic functions. Combined these platforms with advanced transcriptomic analysis to enable high-throughput, high-resolution studies in organoid systems and precision drug testing.

Maher SP, Vantaux A, ... Conway AJ, [Jiang RHY](#), Russell B, Bifani P, Campo B, Nosten F, Witkowski B, Kyle DE.

Probing the distinct chemosensitivity of Plasmodium vivax liver stage parasites and demonstration of 8-aminoquinoline radical cure activity in vitro

**Scientific Report** 2021 PMID: 34620901

Maher SP, Conway AJ, Roth A, Adapa SR..., [Jiang RHY](#) and Kyle DE.

An adaptable soft-mold embossing process for fabricating optically-accessible, microfeature-based culture systems and application toward liver stage antimalarial compound testing

**Lab-on-a-Chip** 2020 PMID: 32055808

*This study reports our minimalistic in vitro human liver system that is capable of robust complex metabolic processes.*

Roth A, Adapa SR, Zhang M, Liao X, Saxena V, Goffe R, Li S, Ubalee R, Saggiu GS, Pala ZR, Garg S, Davidson S, [Jiang RHY](#)<sup>^</sup>, Adams JH<sup>^</sup>.

Unraveling the Plasmodium vivax sporozoite transcriptional journey from mosquito vector to human host.

**Scientific Report** 2018 PMID:30111801

Roth A\*, Maher SP\*, Conway A ...Lanar DE, Nosten F, Davidson S, [Jiang RHY](#), Kyle DE, Adams JH.

A comprehensive model for assessment of liver stage therapies targeting Plasmodium vivax and Plasmodium falciparum

**Nature Communications** 2018 PMID: 29743474

### High-Resolution Bioengineering and Biocomputation

Advanced nanoscale imaging and deep phenotyping platforms for subcellular analysis and single-cell resolution studies. Developed integrated pipelines combining mass cytometry, nano-endoscopy, and deep learning to decode regulatory architecture and cellular maturation with high spatial and computational precision.

Wang C, Dong Y, Li C, Oberstaller J, Zhang M, Gibbons J, Pires CV, Xiao M, Zhu L, [Jiang RHY](#), Kim K, Miao J, Otto TD, Cui L, Adams JH, Liu X.

MalariaSED: a deep learning framework to decipher the regulatory contributions of noncoding variants in malaria parasites.

**Genome Biol.** 2023 PMID: 37845769

Thomson-Luque R, Wang C, ..., Conway A, Adapa SR, Barnes SJ, Adams JH, Jiang RHY.

In-depth phenotypic characterization of reticulocyte maturation using mass cytometry.

**Blood Cells Mol Dis.** 2018 PMID: 30007855

This is the first single-cell human reticulocyte and erythroid study

Cheemalapati SV, Winkas J, Wang H, Konnaiyan K, Zhdanov A, Roth A, Adapa SR, Deonaraine A, Noble M, Das T, Gatenby R, Westerheide SD, Jiang RHY and Pyayt A. Subcellular and in-vivo Nano-Endoscopy.

**Scientific Report** 2016 Oct

### Precision Medicine and Big Data Harnessing

Led interdisciplinary efforts to integrate multi-omics, clinical data, and algorithmic tools for advancing rare disease research, consumer genomics, and gut-brain axis discovery. Developed and coordinated precision health hackathons and applied population-scale data to address challenges in personalized medicine, public health risk communication, and complex system biology.

Bonsack B, Jiang RHY, Borlongan CV.

A gut feeling about stroke reveals gut-brain axis' active role in homeostasis and dysbiosis.

**J Cereb Blood Flow Metab.** 2020 PMID: 32063084

Liu X, Cragun D, Pang J, Adapa SR, Fonseca R, Jiang RHY.

False Alarms in Consumer Genomics Add to Public Fear and Potential Health Care Burden.

**Journal of Personalized Medicine** 2020 PMID: 33113957

Ferreira GC, Oberstaller J, Fonseca R, Keller TE, Adapa SR, Gibbons J, Wang C, Liu X, Li C, Pham M, Dayhoff li GW, Duong LM, Reyes LT, Laratelli LE, Franz D, Fatumo S, Bari AG, Freischel A, Fiedler L, Dokur O, Sharma K, Cragun D, Busby B, Jiang RHY.

Iron Hack - A symposium/hackathon focused on porphyrias, Friedreich's ataxia, and other rare iron-related diseases.

**F1000Res.** 2019 PMID: 31824661

### Large-Scale Genome Engineering

Co-Pioneered forward genetic and transposon mutagenesis platforms to enable high-throughput functional genomics in both human and pathogen systems. Developed scalable tools for genome-wide screening and quantitative phenotyping, advancing

discovery of essential genes, resistance mechanisms, and lineage-specific adaptations.

Zhang M, Wang C, Oberstaller J, Thomas P, Otto TD, Casandra D, Boyapalle S, Adapa SR, Xu S, Button-Simons K, Mayho M, Rayner JC, Ferdig MT, [Jiang RHY](#), Adams JH.

The apicoplast link to fever-survival and artemisinin-resistance in the malaria parasite. **Nature Communications**. 2022 PMID: 34315897

Bronner IF, Otto TD, Zhang M, Udenze K, Wang CQ, Quail MA, [Jiang RHY](#), Adams JH, Rayner JC.

Quantitative Insertion-site Sequencing (QIseq) for high throughput phenotyping of transposon mutants.

**Genome Research**. 2016 PMID: 27197223

Egan ES, [Jiang RHY](#), Moechtar MA, Barteneva NS, Weekes MP, et al

A forward genetic screen identifies erythrocyte CD55 as essential for Plasmodium falciparum invasion.

**Science** 2015 PMID: 25954012

*This is the first large-scale human hematopoietic stem cell mutagenesis study in erythropoiesis.*

### Epigenetics and Pathology

Led and contributed to pioneering studies that revealed how chromatin architecture, histone modifications, RNA regulation, and methylation dynamics control gene expression and virulence. Integrated epigenomics with transcriptomics and vesicle biology to uncover novel regulatory mechanisms underlying pathogenesis, developmental transitions, and host–parasite communication.

Min H, Liang X, ... Adapa SR, [Jiang RHY](#), Ning G, Cao Y, Lindner SE, Miao J, Cui L. The DEAD-box RNA helicase PfDOZI imposes opposing actions on RNA metabolism in Plasmodium falciparum.

**Nature Communications** 2024 PMID: 38702310

Lucky AB, Wang C, Li X, Chim-Ong A, Adapa SR, Quinlivan EP, [Jiang RHY](#), Cui L, Miao J.

Characterization of the dual role of Plasmodium falciparum DNA methyltransferase in regulating transcription and translation.

**Nucleic Acids Res**. 2023 PMID: 37026483

Lucky AB, Wang C, Liu M, Liang X, Min H, Fan Q, Siddiqui FA, Adapa SR, Li X, [Jiang RHY](#), Chen X, Cui L, Miao J.

A type II protein arginine methyltransferase regulates merozoite invasion in Plasmodium falciparum

**Communications Biology** 2023 PMID: 37349497

Wang C, Gibbons J, Adapa SR, Oberstaller J, Liao X, Zhang M, Adams JH, [Jiang RHY](#).

The human malaria parasite genome is configured into thousands of

coexpressed linear regulatory units.

**J Genet Genomics.** 2020 PMID: 33272860

Miao J, Wang C, Lucky AB, Liang X, Min H, Adapa SR, [Jiang RHY](#), Kim K, Cui L.  
A unique GCN5 histone acetyltransferase complex controls erythrocyte invasion and virulence in the malaria parasite *Plasmodium falciparum*.

**PLoS Pathog.** 2021 PMID: 34403450

Babatunde KA, Mbagwu S, Hernández-Castañeda MA, Adapa SR, Walch M, Filgueira L, Falquet L, [Jiang RHY](#), Ghiran I, Mantel PY.  
Malaria infected red blood cells release small regulatory RNAs through extracellular vesicles.

**Scientific Report** 2018 PMID: 29343745

Gibbons J, Button-Simons KA, Adapa SR, Li S, Pietsch M, Zhang M, Liao X, Adams JH, Ferdig MT, [Jiang RHY](#).  
Altered expression of K13 disrupts DNA replication and repair in *Plasmodium falciparum*.

**BMC Genomics.** 2018 PMID: 30486796

### Host–Microbe Interactions

Investigated molecular mechanisms that govern pathogen sensing, antigenic variation, and immune evasion across diverse host–microbe systems. Combined functional genomics, chromatin biology, and environmental modeling to reveal how microbes manipulate host pathways, adapt to transmission cues, and respond to ecological pressures—including light pollution and metabolic scaling in wildlife.

Downs CJ, Schoenle LA, Goolsby EW, Oakey SJ, Ball R, [Jiang RHY](#), Martin LB.  
Large Mammals Have More Powerful Antibacterial Defenses Than Expected from Their Metabolic Rates.

**Am Nat.** 2023 PMID: 36724463.

Pires CV, Oberstaller J, Wang C, Casandra D, Zhang M, Chawla J, Adapa SR, Otto TD, Ferdig MT, Rayner JC, [Jiang RHY](#), Adams JH.  
Chemogenomic Profiling of a *Plasmodium falciparum* Transposon Mutant Library Reveals Shared Effects of Dihydroartemisinin and Bortezomib on Lipid Metabolism and Exported Proteins.

**Microbiol Spectr.** 2023. PMID: 37067430

Kernbach ME, Martin LB, Unnasch TR, Hall RJ, [Jiang RHY](#), Francis CD.  
Light pollution affects West Nile virus exposure risk across Florida.

**Proc Biol Sci.** 2021 PMID: 33757351

Adapa SR, Taylor RA, Wang C, Thomson-Luque R, Johnson LR, [Jiang RHY](#).  
*Plasmodium vivax* readiness to transmit: implication for malaria eradication.

**BMC Syst Biol.** 2019 PMID: 30634978

Ganter M, Goldberg JM, Dvorin JD, Paulo JA, King JG, Tripathi AK, Paul AS, Yang J, Coppens I, [Jiang RHY](#), Elsworth B, Baker DA, Dinglasan RR, Gygi SP, Duraisingh MT.  
*Plasmodium falciparum* CRK4 directs continuous rounds of DNA replication during

schizogony.

**Nature Microbiology** 2017 PMID: 28211852

Pellé KG\*, Jiang RHY\*, Mantel PY, Xiao YP, Hjelmqvist D, Gallego-Lopez GM, Lau AO, Kang BH, Allred DR, Marti M.

Shared elements of host-targeting pathways among apicomplexan parasites of differing life styles.

**Cell Microbiol** 2015 PMID: 25996544

Paul AS, Saha S, Engelberg K, Jiang RHY, Coleman BI, Kosber AL, et al  
Parasite Calcineurin Regulates Host Cell Recognition and Attachment by Apicomplexans.

**Cell Host Microbe** 2015 PMID: 26118996

Coleman BI, Skillman KM, Jiang RHY, Childs LM, Altenhofen LM, et al  
A Plasmodium falciparum histone deacetylase regulates antigenic variation and gametocyte conversion.

**Cell Host Microbe** 2014 PMID: 25121747

### Evolutionary Genetics

Contributed to landmark genome projects and comparative studies that revealed mechanisms of host adaptation, immune evasion, and cross-species transmission. Led or collaborated on analyses uncovering deep evolutionary patterns in pathogens and primates, including host jumps, genetic diversity, and resistance traits, shaping our understanding of pathogen emergence and species-specific immune responses.

McMinds R, Jiang RHY, Adapa SR, Cornelius Ruhs E, Munds RA, Leiding JW, Downs CJ, Martin LB. Bacterial sepsis triggers stronger transcriptomic immune responses in larger primates.

**Proc Biol Sci.** 2025 PMID: 38917861

Sacco MD, Wang S, Adapa SR, ... Wang J, Eswara PJ, Gelis I, Jiang RHY, Sun X, Chen Y.

A unique class of Zn<sup>2+</sup>-binding serine-based PBPs underlies cephalosporin resistance and sporogenesis in *Clostridioides difficile*

**Nature Communications** 2022 PMID: 35902581

Dankwa S, Lim C, Bei AK, Jiang RHY, Abshire JR, Patel SD, Goldberg JM, et al.  
Ancient human sialic acid variant restricts an emerging zoonotic malaria parasite.

**Nature Communications** 2016 PMID: 27041489

Neafsey DE, Galinsky K, Jiang RHY, Young L, Sykes SM et al.

The malaria parasite *Plasmodium vivax* exhibits greater genetic diversity than *Plasmodium falciparum*.

**Nature Genetics** 2012 PMID: 22863733

Raffaele S, Farrer RA, Cano LM, Studholme DJ, MacLean D, Thines M, Jiang RHY, Zody MC, et al

Genome evolution following host jumps in the Irish potato famine pathogen lineage.

**Science** 2010 PMID: 21148391

Baxter L, Tripathy S, ..., Jiang RHY, Judelson H, Kamoun S, et al.  
 Signatures of adaptation to obligate biotrophy in the *Hyaloperonospora arabidopsidis* genome.  
**Science** 2010 PMID: 21148394

Haas BJ, Kamoun S, Zody MC, Jiang RHY, Handsaker RE, et al.  
 Genome sequence and analysis of the Irish potato famine pathogen *Phytophthora infestans*.  
**Nature** 2009 PMID: 19741609

## Funding Support

### Active Awards

**Role:** Principal Investigator (Consortium co-PI) – *Rays H.Y. Jiang*  
**Project Title:** *Integrating spatial analysis of the lipidome, transcriptome, and microbiome to fundamentally advance our understanding of the tumor microenvironment at the single-cell level—a key to cancer cures*  
**Contact PI:** Timothy Yeatman, MD  
**Funding Source:** Florida Department of Health (Casey DeSantis Florida Cancer Innovation Fund #268)  
**Project Period:** 07/01/2025 – 12/31/2026  
**Total Award:** \$1,995,456  
**Summary:** This project integrates spatial lipidomics, transcriptomics, and microbiome profiling using human samples and preclinical models to identify strategies for reprogramming cancer immunity at single-cell resolution.

**Role:** Principal Investigator (Consortium co-PI) – *Rays H.Y. Jiang*  
**Project Title:** *Genomics of Kotzebue Sound beluga whales*  
**Partner PI:** Gregory O’Corry-Crowe, PhD  
**Funding Source:** Alaska Beluga Whale Committee (ABWC)  
**Project Period:** 10/01/2025 – 05/31/2027  
**Total Award:** \$200,000  
**Summary:** Whole-genome sequencing of historical and contemporary beluga whale samples to assess genetic diversity, stock identity, and long-term population viability.

**Role:** Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Precision Medicine USF Provost Initiative – CREATE Award*  
**Funding Source:** USF Provost’s Office  
**Project Period:** 07/01/2024 – 06/30/2027  
**Total Award:** \$500,000  
**Summary:** Leads USF’s first institutional precision medicine program, integrating cross-college faculty and building translational multi-omics platforms for chronic and metabolic disease research.

**Role:** Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Upgrade at USF Genomics – Bridging High-Resolution Technological*

*Gaps*

**Funding Source:** USF Research

**Project Period:** 07/01/2024 – 06/30/2026

**Total Award:** \$265,122

**Summary:** Supports infrastructure enhancement at USF to expand single-cell and spatial transcriptomics capacity for precision health research.

**Role:** Co-Investigator – *Rays H.Y. Jiang*

**Project Title:** *Dolphin Conservation in a Changing Environment: Investigating Impact–Response Dynamics in Florida Dolphin Populations*

**Principal Investigator:** Gregory O’Corry-Crowe, PhD

**Funding Source:** FAU / Harbor Branch Oceanographic Institute Foundation

**Project Period:** 07/2024 – 05/31/2025

**Total Award:** \$32,000

**Summary:** Investigates environmental and pathogenic stressors on dolphin populations; Jiang provides genomic and analytical support for population health assessments.

**Role:** Co-Investigator – *Rays H.Y. Jiang*

**Project Title:** *Multivalent Vaccines Against Clostridioides difficile Infection*

**Contact PI:** Sun Xingmin, PhD

**Co-PI:** Shifeng Wang, PhD

**Funding Source:** NIH/NIAID (Grant #: 2R01AI132711-06)

**Project Period:** 04/01/2024 – 03/31/2028

**Total Award:** \$3,702,788

**Summary:** Supports vaccine development through immunogenomics, host-pathogen interaction profiling, and translational research.

**Role:** Co-Investigator – *Rays H.Y. Jiang*

**Project Title:** *Chemogenomic Profiling of Plasmodium falciparum Responses and Resistance*

**Principal Investigator:** John Adams, PhD

**Collaborators:** Julian Rayner, PhD (Sanger Institute); Thomas Otto, PhD (University of Glasgow)

**Funding Source:** NIH/NIAID (Grant #: R01AI130171)

**Project Period:** 07/2021 – 06/2026

**Total Award:** \$736,437

**Summary:** Uses genome-wide screening to understand antimalarial drug resistance. Jiang contributes genomics expertise to integrative data analysis and target validation.

**Past Awards**

**Role:** Principal Investigator – *Rays H.Y. Jiang*

**Project Title:** *Targeting Heme Dependency in Leukemia*

**Funding Source:** Florida Department of Health (Grant #: 9BC14)

**Project Period:** 06/04/2019 – 03/31/2022

**Total Award:** \$801,000

**Jiang’s Share:** \$301,912

**Role:** Co-Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *IMAGINE: Epigenetic Potential and Range Expansion in the House Sparrow*  
**Principal Investigator:** Lynn Martin, PhD  
**Funding Source:** National Science Foundation (IOS-2027040)  
**Project Period:** 09/01/2020 – 08/31/2024  
**Total Award (USF Share):** \$772,004

**Role:** Co-Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Targeting Mutant KRAS for Cancer Therapy*  
**Principal Investigator:** Said Sebtj, PhD  
**Funding Source:** National Cancer Institute (R35CA197731)  
**Project Period:** 03/01/2016 – 02/28/2023  
**Total Award:** \$3,706,347  
**Jiang's Share:** \$116,254

**Role:** Co-Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Discovering the Essential Genome of Plasmodium falciparum*  
**Principal Investigator:** John Adams, PhD  
**Funding Source:** NIH/NIAID (R01AI130171)  
**Project Period:** 06/15/2018 – 05/31/2022  
**Total Award:** \$1,474,760 through 2020; Anticipated \$2,775,060  
**Jiang's Share:** \$262,606 (anticipated)

**Role:** Co-Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Collaborative Research: Constraints of Biomass on Immunity Across Terrestrial Mammals*  
**Principal Investigator:** Cynthia Down, PhD  
**Funding Source:** National Science Foundation (Grant #: 165668)  
**Project Period:** 05/15/2017 – 04/30/2022  
**Total Award:** \$384,543  
**Jiang's Share:** \$16,684

**Role:** Co-Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Ionic and Structural Mechanisms for Sensory Neuromodulation of the Esophagus*  
**Principal Investigator:** Thomas Taylor-Clark, PhD  
**Funding Source:** NIH/NIDDK (U01DK116311)  
**Project Period:** 09/01/2017 – 08/30/2021  
**Total Award:** \$785,947

**Role:** Co-Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Chemogenomic Profiling of Plasmodium falciparum Drug Responses and Resistance*  
**Principal Investigator:** John Adams, PhD (contact)  
**Collaborator:** Michael Ferdig, PhD, University of Notre Dame  
**Funding Source:** NIH/NIAID (R01AI117017)  
**Project Period:** 02/10/2015 – 01/31/2020  
**Total Award:** \$3,541,531  
**Jiang's Share:** \$220,035

**Role:** Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Single-Cell Genomics and Erythropoiesis: High-Resolution RBC Developmental Map to Address Iron-Deficiency Anemia*  
**Co-Investigators:** Gloria Ferreira, PhD; Elizabeth Sagatys, MD  
**Funding Source:** Women’s Health Collaborative, USF Health  
**Project Period:** 07/01/2018 – 06/30/2020  
**Total Award:** \$15,000  
**Jiang’s Share:** \$15,000

**Role:** Co-Investigator – *Rays H.Y. Jiang*  
**Project Title:** *3D Microfluidic Human Liver Models for Malaria Drugs*  
**Principal Investigator:** Dennis Kyle, PhD  
**Funding Source:** Bill and Melinda Gates Foundation (OPP1023601)  
**Project Periods:**  
 11/10/2010 – 12/29/2016 (primary award to USF)  
 12/30/2016 – 12/31/2019 (subaward to USF)  
**Total Award:** \$4,192,100  
**Jiang’s Share:** \$12,317 (2015–2016); \$707,254 (2016–2019)

**Role:** Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Tracking the Cellular Origin of Malignant Erythropoiesis Using Single-Cell Genomics*  
**Co-Investigators:** Gloria Ferreira, PhD; Said Sebti, PhD; Elizabeth Sagatys, MD  
**Funding Source:** American Cancer Society / Moffitt Cancer Center (IRG-14-189-19)  
**Project Period:** 08/01/2017 – 07/31/2018  
**Total Award:** \$30,000  
**Jiang’s Share:** \$30,000

**Role:** Principal Investigator – *Rays H.Y. Jiang*  
**Project Title:** *Single-Cell Omics – The New Frontier of Life Sciences at USF*  
**Co-Investigators:** John Adams, Gloria Ferreira, Kami Kim, Thomas McDonald, Lindsey Shaw, Xingmin Sun, Michael White  
**Funding Source:** USF Research & Innovation (Equipment Acquisition and Improvement Grant)  
**Project Period:** 04/01/2018 – 06/30/2018  
**Total Award:** \$122,385



## Creative Contributions

Created thousands of original art work; and wrote original computational code to digitally process these art pieces.

Rays Jiang Designed all logos featured in this document for various academic and outreach events.

Personal website [www.raysjiang.org](http://www.raysjiang.org)