

UCLA Institute for Quantitative & Computational Biosciences

QCBio Updates

A newsletter – Summer 2020

“As UCLA adapted to remote learning, QCBio led the way with workshops, collaborative opportunities and mentorship. BIG Summer 2020 - thanks to the enthusiasm of our faculty and direct research mentors - demonstrated that remote undergraduate research programs can work !”

CONTENTS:

QCB Research Talks

- Spring 2020 – postdocs and students
- Summer 2020 – QCB faculty

BIG Summer

- New BIG Summer Programs Manager
- Alumni news
- Record enrollment in 2020
- Unprecedented Success in 38 laboratories

QCB Collaboratory

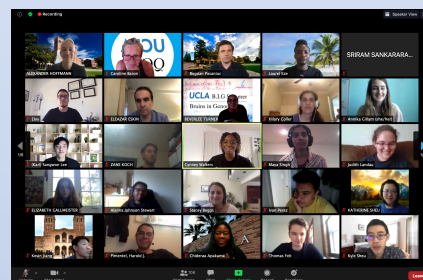
- New QCBio Collaboratory Programs Manager
- Spring 2020 - record enrollment!
- Welcome new Collaboratory fellows
- Schedule for Fall 2020 posted!

QCBio Retreat 2020

New QCBio members: Faculty and Grad Students

QCB's ongoing Projects

- Computational Needs Survey
- Graduate Programs Navigator
- Undergraduate Research Match Maker



UPCOMING EVENTS:

- **QCB Research Seminars**
Fridays 11am
- **Joint Bioinformatics/
Genomics Seminars**
Mondays 11am
- **Career Development
Workshop** Nov 20 2pm

QCB's 5-year review was completed last April and was a great success!

Greg Payne, GPB Director, Review Committee Chair

Song Li, Chair, Department of Bioengineering, UCLA

Tom O'Dell, Executive Vice-Chair, Physiology, UCLA

Mark Alber, Director, Interdisciplinary Center for Quantitative Modeling, UC Riverside

Terry Gaasterland, Director, Scripps Genome Center, UC San Diego

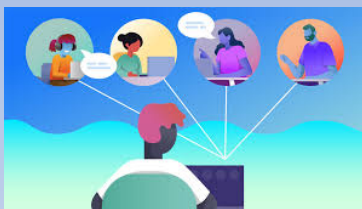
QCBio Research Talks

Thank you to all the presenters!

Spring 2020 Postdocs & Students

- **Ying Tang** (Hoffmann Lab)
- **Gabe Hassler** (Suchard Lab)
- **Brandon Jew** (Halperin & Sul Labs)
- **Dibakar Sigdel** (Ping Lab)
- **Julie Miller** (Pinter-Wollman Lab)
- **Katherine Sheu** (Hoffmann Lab)
- **Zhenyu Zhang** (Suchard Lab)
- **Tzitziki Lemus Vergara** (Krugyak Lab)
- **Rob Brown** (Sankararaman Lab)
- **Chrysostomos Marasinou** (Hsu Lab)
- **Leah Briscoe** (Garud Lab)
- **David Pan** (Pajukanta Lab)
- **Ruochen Jiang** (Li JJ Lab)
- **Russell Littman** (Yang Lab)
- **Luca Bottcher** (Chou Lab)
- **Ha Vu** (Ernst Lab)
- **Shuo Li** (Zhou Lab)
- **Benny Borremans** (Lloyd-Smith Lab)
- **Yidan Sun** (Li JJ Lab)
- **Colin Farrell** (Pellegrini Lab)
- **Kofi Amoah** (Xiao Lab)

Check out our archived videos at:
<https://qcb.ucla.edu/events/list/?eventDisplay=past>



Summer 2020 (in Collaboration with B.I.G. Summer): QCBio Faculty

- **Richard Ahn**
QCBio Faculty Fellow, UCLA Microbiology, Immunology & Molecular Genetics
"Gene Expression Dynamics in Kidney Transplantation Patients with Cytomegalovirus Viremia"
- **Dan Geschwind**
Gordon and Virginia MacDonald Distinguished Professor in Neurology, Psychiatry and Human Genetics, Senior Associate Dean and Associate Vice Chancellor for Precision Health
Director, Center for Autism Research and Treatment, Semel Institute
"Using transcriptomic networks to identify new pathways and drugs in brain diseases"
- **Xia Yang**
Professor Integrative Biology and Physiology,
"Multitissue Multiomics Systems Biology of Complex Diseases"
- **Nandita Garud**
Assistant Professor, Department of Ecology and Evolutionary Biology,
"Detection of Hard and Soft Selective Sweeps from Population Genomic Data"
- **Xinshu (Grace) Xiao**
Maria R. Ross Chair in Biological Sciences
Director, Bioinformatics Interdepartmental Program, Professor of Integrative Biology and Physiology
"Isoform and Sequence Diversity in RNA: Genetic Basis and Beyond"
- **Eleazar Eskin**
Professor and Chair, Department of Computational Medicine
"UCLA's Genomics and AI efforts against COVID-19"

B.I.G. Summer 2020

The Bruins in Genomics (B.I.G.) Summer Research Program is an 8-week full-time immersion program for undergraduates interested in learning about Bioinformatics, Computational Biology and Genomics — and developing some of the skill-sets that are critical for 21st century Biological and Biomedical Research, and Precision Medicine. For more information on B.I.G. Summer, please visit our webpage: <https://qcb.ucla.edu/big-summer/>



Welcome Beverlee Turner, BIG Summer Programs Manager!

Meet Bev Turner, our new Undergraduate Research Programs Manager. Bev joins us with a background in research, medical school recruitment and multicultural affairs. She was brought on board to manage our first Remote B.I.G. Summer Program and is excited to be a part of the QCBio Community!



Computational Genetics (19)

Lohmueller Lab
Nina Sachdev
Ophoff Lab
Daniel Noah
Lizbeth Gonzalez

Sinsheimer/Papp
Rowan Christie
Karina Rodriguez

Eskin Lab
Elizabeth Gallmeister
Annika Gilliam

Tward Lab
Ophelia Yang
Jaqueline Lu

Zhou Lab
Jordan Dockstadter
Adam DeHollander
Eileen Yang
Jessica Wu

Pimentel Lab
Jingyou Rao
Yiwen Chen
Ashwin Ranade

Boutros Lab
Ashlynn Crisp
Samuel Shenoi
Matthew Laderoute
John Lee

Pasaniuc Lab
Sandra Lapinska
Jessie Chen

Sul Lab
Stephen Hwang
Jordan Dockstadter

Park Lab
Sean Dickson

Butte Lab
Humza Khan

Franco Lab
Judith Landau

Savage Lab
Shaili Mathur

Wollman Lab
Claiborne Tydings

Garud Lab
Daisy Chen
Shovanna Jackson
Kevin Delao
Etan Dieppa-Colon

Zaitlen Lab
Molly Smullen

Sankaranarayanan Lab
Oona Risse-Adams
Estelle Han
David Tang
Michael Cheng
Maya Singh

Epigenomics (19)

Arboleda Lab
Stephanie Horsfall
Ameenah Jackson
Cynney Walters

Ernst Lab
Mudi Yang
Megan Andren
Joseph Galasso
Zane Koch
Kale Anshul

Xiao Lab
Tori Conception
Bridget Phillips

Luo Lab
Chideraa Apakama

Pellegrini Lab
Janna Kleinsasser
Anthony Sun
Adam Dery

Jessica Li Lab
Manasvi Malepati

Fan Lab
Arnold Pfahnl

Graeber Lab
Kyle Sheu

Alber Lab
Serafina Turner

Deeds Lab
Sandy Kim
Anna Spiro

Hoffmann Lab
Chidera Okeke
Minh Nguyen
Kevin Jiang

Meyer Lab
Madison Wahlsten

Geschwind Lab
Shruti Gupta
Thomas Felt

Some facts about B.I.G. Summer 2020...

- June 22 to August 14, 2020
- 5th annual program
- 370+ applications
- 74 admitted students
- 38 faculty mentors
- 38 direct research mentors
- 54 mentors nominated by their mentees for outstanding mentorship!

Talks & Abstracts Posted on the QCBio Website at <https://qcb.ucla.edu/big-summer/big2020/>

Huge thank you to all mentors!

Alumni News:

Congratulations goes to B.I.G. Summer Alumna: Michele Ramos Correa on her 2020 NSF Graduate Research Fellow Award!

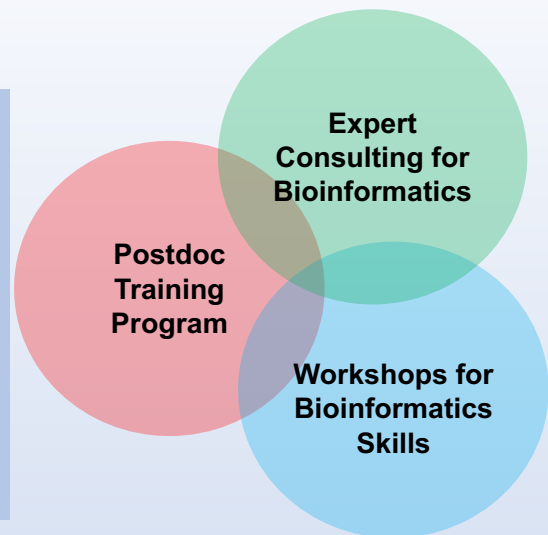
Michele was in Grace Xiao's lab in summer 2018. This shaped her scientific interests as she is currently pursuing a PhD at UC Santa Cruz with Dr. Susan Carpenter studying the roles of long non-coding RNAs in inflammation. BIG Summer alumnae and alumni from 2015 to 2019 are doing incredible things all over the country they joined the BIG Summer cohort of 2020 this summer in a special zoom session and form an active a Linked-In community.

Thanks to Lizbeth Gonzalez:
Awardee for best T-Shirt design!

```
<!DOCTYPE html>
<html>
<head>
<title> UCLA QCBIO </title>
</head>
<body>
<h1> B.I.G. Summer 2020 </h1>
<p> COVID-19 Edition </p>
<!-- Summer Undergraduate Research Program -->
</body>
</html>
```

The QCBio Collaboratory

The mission of the QCBio Collaboratory is to provide computational research support to projects initiated by experimentalists. This mission pursued at three levels: (i) collaborative support or consulting work, (ii) workshops to convey commonly used bioinformatics skills for the analysis of Next Gen Sequencing data, (iii) the QCB Bioinformatics Core offers a semi-automated workflow for common types of analyses of next generation sequencing data. These activities are supported by the QCB Collaboratory postdoctoral fellows, who are selected from a broad applicant pool for renewable annual appointments.



Welcome Eloy Lopez III, QCBio & QCBio Collaboratory Programs Manager!



Eloy provides academic, administrative and analytic support for the Institute for Quantitative and Computational Biosciences (QCBio) and the QCBio Collaboratory. His role includes overseeing marketing, recruitment, hiring, and inter-departmental financial support the QCBio Collaboratory postdoctoral fellows; as well facilitating an inclusive learning environment for our postdoc fellows who teach the latest next-generation sequencing techniques.

Record number of students registered for QCBio Collaboratory Workshops in Spring 2020

Position Type	# of Participants
Alumni	2
Assistant Project Scientist	13
Faculty	27
Graduate Student	379
HS Student	1
Other	62
Postdoc	199
Project Scientist	4
Research Assistant	1
Research Biologist	2
Resident	2
Senior Research Associate	1
Brain and Body Lab	
Staff	119
Tech	1
Undergraduate Student	92
Volunteer	1
Volunteer Research Assistant	4
Volunteer Senior Research Assistant	3
Assistant	
Total Number of Participants	913

The Collaboratory: Workshops for Fall 2020:

- Intro to Unix
- Intro to Python
- Using NGS Analysis Tools
- Advanced Python
- Intro to MATLAB
- Library Prep for NGS
- Intro to R
- Intro to Modern Statistics
- Protein Interactions with Cytoscape
- Digital Imaging Processing
- Single-Cell RNA-Seq
- Metagenomics Analysis
- DNA Methylation
- Variant Discovery with GATK
- RNA-seq I Analysis
- Galaxy for NGS
- RNA-seq II Analysis
- RNA-seq III Analysis

Interested? Check out!

<https://qcb.ucla.edu/collaboratory/schedule-of-workshops/>



Introducing new Collaboratory Fellows:



Lukasz Salwinski, Ph.D.

Dr. Lukasz Salwinski is currently an assistant researcher in the laboratory of Professor David Eisenberg who, for over a decade, has been responsible for development and maintenance of The Database of Interacting Proteins (<https://dip.doe-mbi.ucla.edu>). He received his master degree in biology at the Jagiellonian University, Krakow (Poland) and earned Ph.D. at UCLA, in the group of Professor Wayne Hubbell where he applied EPR spectroscopy to study structure of pore-forming bacterial toxins.

Ibraheem Ali, Ph.D.



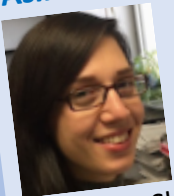
Dr. Ibraheem Ali is currently the Sciences Data Librarian at the Louise M. Darling Biomedical Library. There, he serves between the UCLA Library and the graduate programs in the biosciences and preclinical research. Ali recent efforts have focused on building advanced computation and data visualization strategies for researchers and promoting scholarly communication tools that support reproducibility and data management in biomedical and clinical research. Ali received his Bachelor's Degree in Biology at Fresno State University, and a Ph.D. in Biomedical Sciences at UCSF.

Breanne Sparta, Ph.D.



Dr. Sparta is a postdoctoral fellows in Eric Deed's Lab at the Department of Integrative Biology and Physiology. Breanne's work explores theories of biological organization and variation. Their current research centers questions of how cellular identities are realized. Breanne completed her B.S. in Biochemistry at Northeastern University and her Ph.D. at the University of California, Davis, where she studied the coordination of growth and metabolism in single, living cells.

Asli Yildirim, Ph.D.



Dr. Asli Yildirim is a postdoctoral fellow in Dr. Frank Alber's lab at the Department of Microbiology, Immunology, and Molecular Genetics. She received her Ph.D. in Chemistry from Michigan State University, and B.S. and M.S. degrees in Chemistry from Bogazici University in Turkey. Her research focuses on developing computational methods to build 3D genome structures and understanding the relationship between genome structure and function.

Marina Linardic, Ph.D.



Dr. Marina Linardic is a postdoctoral fellow in Dr. Siobhan A. Braybrook's laboratory at the Department of Molecular, Cell and Developmental Biology. She received advanced degrees in Ecology and Nature Protection at the University of Zagreb, and also was awarded the ERASMUS scholarship to study at the University of Vienna. She received her Ph.D. from the University of Cambridge where she focused on understanding cell wall-mediated expansion in the brown algal lineage. Using both experimental and computational approaches, she is currently investigating cellular and molecular mechanisms of abiotic stress adaptation in intertidal brown algae.

QCBio Retreat 2020

Our annual retreat was an opportunity to welcome new faculty, postdocs, and students, but also to take stock of where we are, to set goals, and define agendas.

This year, on September 30, we had more than 180 registrants. It was exciting to learn updates from associated program directors and recognize the synergies between each of the component parts of the UCLA ecosystem in quantitative and computational biosciences. Scientific sessions were inspiring thanks to the Faculty and selected students who delivered such interesting and engaging scientific talks.



If you have missed the event, please visit our website to listen to some of the recordings or view our program:

<https://qcb.ucla.edu/events-seminars/retreat/2020-retreat-gallery/>

A big thank you to those who participated in the best T-shirt contest!

- Elaine Huang
- Dylan Steinecke
- Katherine Sheu
- Samir Akre
- Al Rahrooh

And won a \$75 Amazon gift card

Congratulations to

Cindy Wen

Who won the best
Retreat 2020 T-shirt
design!



Any QCB Retreat participants may pick up
their T-shirt in Boyer Hall.

E-mail: QCBOffice@lifesci.ucla.edu

Introducing the new Faculty:



Daniel Tward
*Assistant Professor,
Departments of Computational
Medicine and Neurology*

Dr. Daniel Tward's research focuses on building computational tools that use imaging data to understand how disease affects the brain's structure. One application is studying neurodegeneration in the earliest stages of Alzheimer's disease, connecting information in clinical MRI with microscopy data from autopsy. Daniel obtained his Ph.D. in biomedical engineering from Johns Hopkins University, and completed postdoctoral training in biomedical engineering and neuropathology at the Kavli Neuroscience Discovery Institute. He holds a joint appointment in the Department of Computational Medicine, and the Department of Neurology as part of the Brain Mapping Center.



Harold Pimentel
*Assistant Professor, Departments
Computational Medicine and
Human Genetics*

Harold received an MA in statistics and a PhD in computer science from UC Berkeley with Lior Pachter working on ultrafast pseudoalignment and small sample estimation with RNA-seq data. In his postdoc at Stanford with Jonathan Pritchard he worked on methods for integrating human genetics and gene regulation estimation. At UCLA he is continuing the focus of combining gene regulation and human genetics by developing models for screen inference, experimental design, network inference, and improving pseudoalignment approaches.

Abigail Bigham, Associate Professor of Anthropology



Dr. Abigail Bigham is an Associate Professor of Anthropology at UCLA. Abby received her B.A. from the University of Arizona and her PhD from The Pennsylvania State University. She completed a postdoctoral fellowship at the University of Washington. Prior to joining UCLA, Abby was on the faculty at the University of Michigan. Her current research is focused on understanding human genetic adaptation to environmental pressures and how these adaptations affect the range of modern human phenotypic diversity.



Loes Olde Loohuis
*Assistant Professor of Psychiatry &
Biobehavioral Sciences*

Dr. Loes Olde Loohuis' lab studies the underlying molecular mechanisms of severe mental illness. Specifically, the lab aims to characterize and predict psychiatric disease trajectories using genetic and high-dimensional phenotypic data resources, such as electronic health records. The lab has a special focus on the study of populations from Latin America.



Shane Campbell-Staton
*Assistant Professor, Department of
Ecology and Evolutionary Biology*

Shane Campbell-Staton is an evolutionary biologist who studies how climate shapes demographic history and adaptation over prehistoric and contemporary time periods. He combines comparative physiology, genomics, field experimentation and environmental niche modeling to understand how novel environments produce phenotypic and genetic differences between lineages. He believes the study of evolution in response to human-mediated environmental change is key to understanding, predicting and mitigating deleterious effects of such events.

Introducing the new Graduate students:

Bioinformatics



Caroline Chen



Huiling Huang



Matthew Heffel



Harold Wang



Trevor Ridgley



Ran Hu



Elaine Huang



Kathy Ngo



Jonathan Perrie



Mark (Yankai) Xiang



Jamie Matthews



Jonathan Mah



Helen (Xin) Huang



Angela Wei



Ye Wang



Albert Xue

Medical Informatics



Al Rahrooh



David Zheng



Mingzhou (Joy) Fu



Dylan Steinecke



Xiangting Li



Apeksha Singh



Ellen Visscher

Genetics & Genomics



Isabella Lin (MSTP)



Laila Sathe



Alexander Espinoza



Jennifer Grundman



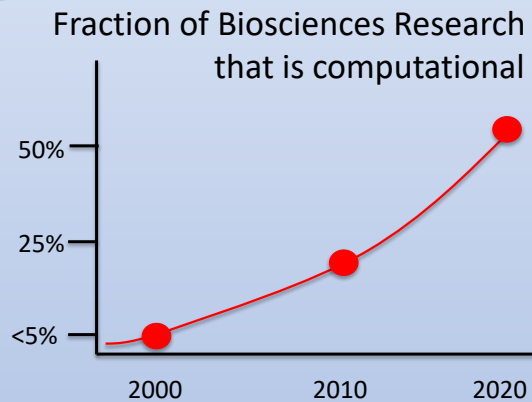
Ye Yang



Nicole Zeltser

Ongoing Projects

Survey of Computational Resource Needs
200+ Bio-Faculty members responded to the survey.
It is not too late to participate and submit your needs:
<https://docs.google.com/forms/d/e/1FAIpQLSflqE-U-LFYkVjeXj4GUmmQMBhkAnoigmqOOx1mDtbrbpBruw/viewform>
There is a wealth of data that is being analyzed.



Thanks for your participation!
Congratulations for winning the raffle
for Undergraduate Fellowships

Felipe Zapata,

Assistant Professor, EEB
Awarded to **Ary Sanchez-Amaya**
Environmental Science Major

Keriann Backus,
Assistant Professor, Biological Chemistry
Guillaume Chanfreau,
Professor, Chemistry & Biochemistry

Undergraduate Research Portal,

<https://bioinformatics.ucla.edu/undergraduate-research/>

Recognizing that computational biology research encompasses diverse disciplinary areas, we are expanding the scope of this site also, to connect UCLA undergraduates and PIs in these areas.

- Computational Genetics and Genomics
- Biomedical Imaging and Informatics
- Computational Neuroscience
- Mathematical Biology and Ecology
- Systems and Synthetic Biology

Coming soon: Graduate Programs Navigator,

a new online overview and navigation tool that clarifies how different UCLA Graduate Programs fit into the ecosystem of Quantitative and Computational Biosciences. Each has a unique combination of characteristics that may be shared among others! This should assist prospective applicants in identifying the graduate program best suited to them.

Your QCBio Team: Caroline, Beverlee, Eloy, Matteo and Alex