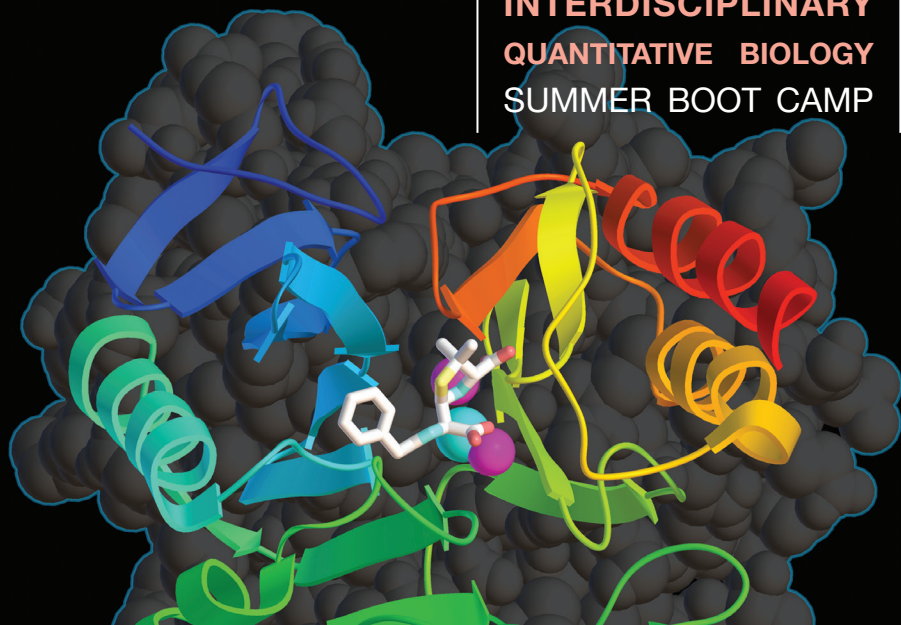


FIRST ANNUAL
INTERDISCIPLINARY
QUANTITATIVE BIOLOGY
SUMMER BOOT CAMP



MECHANISMS OF ANTI-MICROBIAL RESISTANCE

RUTGERS

PROGRAM

June 19 – 23, 2017

Boot Camp Organizers:

Institute for Quantitative
Biomedicine at Rutgers

RCSB Protein Data Bank

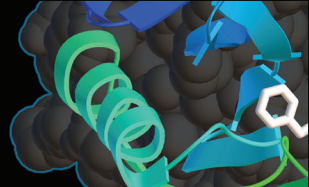
Public Health Research
Institute (PHRI) at the Rutgers
New Jersey Medical School

Rutgers School of
Environmental and Biological
Sciences

Center for Integrative
Proteomics Research

Rutgers University | Busch Campus
174 Frelinghuysen Road
Piscataway, NJ 08854-8076

iqb.rutgers.edu/bootcamp



Interdisciplinary Quantitative Biology Summer Boot Camp

MECHANISMS OF ANTI-MICROBIAL RESISTANCE

The Institute for Quantitative Biomedicine and the Graduate Program in Quantitative Biomedicine are delighted to be collaborating with the Public Health Research Institute (phri.org) and the Rutgers School of Environmental and Biological Sciences to host the First Annual Rutgers Interdisciplinary Quantitative Biology Summer Boot Camp focused on Anti-Microbial Resistance.

The Boot Camp is designed to augment education for quantitative and biological scientists. Our overarching goal is to introduce students of all ages to the value of integrating biology and medicine with mathematics, physics, chemistry, computer science, statistics and biostatistics, and engineering.

This immersive one-week experience will provide broad introductory exposure to the language, culture, and experimental/theoretical underpinnings of molecular biology, macromolecular biochemistry/biophysics, structural biology, computational biology, systems biology, and bioinformatics.

Instruction will take the form of lectures on clinically important antibiotics and bacterial resistance mechanisms, augmented by collaborative hands-on research projects focused on the computational biology, structural biology, biochemistry/enzymology, and evolution of antimicrobial resistance. There will also be career development activities, fun activities for relaxing, and an end-of-week networking opportunity.

The final morning of the Boot Camp will be devoted to a student-led presentation of findings from the collaborative research projects. This event will involve a cooperative synthesis of the material developed during the one-week program.

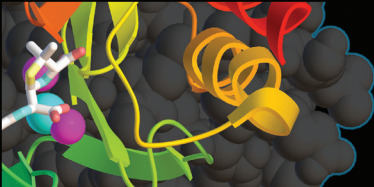
The Boot Camp would not have been possible without tireless efforts of more than 30 contributors from across Rutgers and from our partners at the Rochester Institute of Technology, Cal Poly San Luis Obispo, Ursinus College, Princeton University, SUNY Oswego, and McGill University.

Special thanks to Institute Staff Members Nicole Malkiewicz, Michelle Sanghera, Lia Floreno, Jonathan Hackett, Bernie Cariaga, Don Corrette and Kenneth Dalenberg, and Rutgers students Jason Cariaga, Jennifer Jiang, Hyejin Kim, Christopher Markosian, and Shriya Patel.

On the cover: *PDB Structure 4eyf*

D.T. King, L.J. Worrall, R. Gruninger, N.C. Strynadka (2012).

New Delhi metallo-beta-lactamase: structural insights into beta-lactam recognition and inhibition. *J Am Chem Soc* 134: 11362-11365.



Location:

All sessions will be held in **Proteomics, Room 120** unless designated otherwise.








Laptops:

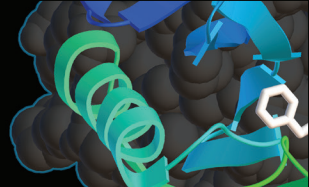
Laptop computers are required for **workshops and group assignments**. See page 11 for software specifications.

Activity Legend











 Lecture	 Group Assignment
 Workshop	 Networking Opportunity

DAY 1








1:00 PM		Introduction and Logistics Stephen K. Burley and Shuchismita Dutta
1:30 PM		<i>Bugs and Drugs</i> Shuchismita Dutta
2:15 PM		<i>An Evolutionary Tale from the PDB</i> Stephen K. Burley
2:45 PM		<i>Coffee/Tea Served</i>
3:00 PM		<i>Introduction to the PDB</i> Shuchismita Dutta
3:30 PM		<i>Workshop: Query and Visualization</i> (Chimera software required; see page 11) Shuchismita Dutta and Team
4:45 PM		<i>Guide to Reading Scientific Literature</i> Ashley Ringer McDonald
5:30 PM		Team Assignments Networking with Light Dinner Proteomics Lobby

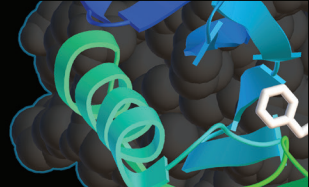


DAY 2

9:00 AM		<i>Bugs vs. Drugs: Antibiotic Resistance in Atomic Detail</i> Albert Berghuis
10:30 AM		<i>Coffee/Tea Served</i>
10:45 AM		<i>Antimicrobial Stewardship</i> Tanaya Bhowmick
11:30 AM		Group Discussion and Assignments Stephen K. Burley and Shuchismita Dutta
12:00 PM		<i>Lunch (independent)</i>
1:00 PM		Career Byte: Being Organized; Making Business Cards Gail Ferstandig Arnold
1:30 PM		<i>Primer on Enzymes and Catalytic Mechanisms</i> Paul A. Craig
2:15 PM		Groups Working on Assignments Participants <i>Coffee/Tea available</i>
4:30 PM		Group Report Out Participants
5:00 PM		Networking with Light Dinner Proteomics Lobby
5:30 PM		<i>Antibacterial Drug Discovery Targeting Bacterial RNA polymerase: Myxopyronins</i> Richard Ebright

DAY 3

9:00 AM		<i>Molecular Epidemiology of Carbapenem Resistant Enterobacteriaceae</i> Barry Kreiswirth
10:30 AM		<i>Coffee/Tea Served</i>
10:45 AM		Groups Working on Assignments Participants
12:00 PM		<i>Lunch (independent)</i>
1:00 PM		Career Byte: Guide to Successful Speaking and Information Sharing Rebecca Roberts
1:30 PM		Groups Working on Assignments Participants <i>Coffee/Tea available</i>
4:30 PM		Group Report Out Participants
5:00 PM		Downtown Meeting, Harvest Moon Gather for carpooling in Proteomics Lobby



DAY 4

9:00 AM



Methicillin and Metal Resistance in S. aureus
Jeffrey Boyd

10:00 AM



Groups Working on Assignments
Participants
Coffee/Tea Available

12:00 PM

Lunch (independent)

1:00 PM



Career Byte: Finding Jobs and Collaborators Using LinkedIn
Gail Ferstandig Arnold

1:30 PM



Groups Working on Assignments
Participants
Coffee/Tea Available

4:30 PM



Group Report Out
Participants

5:00 PM

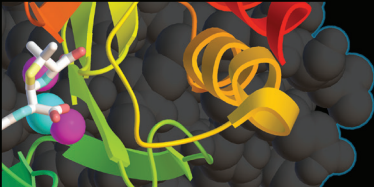


Networking with Light Dinner
Proteomics Lobby

5:30 PM



Finalization of Presentations
Participants



DAY 5

9:00 AM



Final Presentation
Participants

10:30 AM



Coffee/Tea Served

10:45 AM



***Physicians, Farmers, and the Politics of
Antimicrobial Resistance***
Laura Kahn

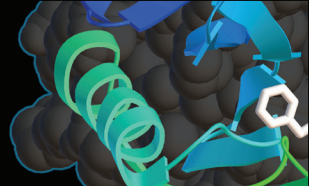
12:00 PM



Lunch Served

1:00 PM

Optional Tours of Structural Biology Instrumentation
for Rutgers Participants;
Departures for NSF Participants



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The organizers would like to extend a special thank you to the boot camp contributors:

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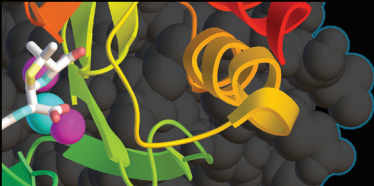
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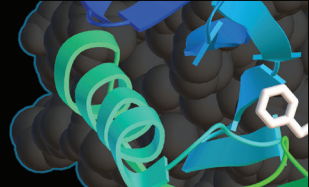
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Software

Boot Camp Participants will be using their own laptops (Windows, Mac, or Linux) for their project research and visualizations. Please make sure you have the following components installed:

1. **Web Browser:** current generation Firefox, Google Chrome, Safari, or Internet Explorer
2. **Java:** latest version. More info at java.com
3. **UCSF Chimera:** free for academic use; follow the download and installation information at cgl.ucsf.edu
4. A **word processing, slide making/presenting, and spreadsheet software** such as Word, Powerpoint, and Excel or any tools with similar functionality.

Additional:

1. Power supply cords
2. External mouse (very useful for Monday's 3:30 Workshop)

Questions?

Contact Michelle Sanghera
or Lia Floreno in

Proteomics, Room 106

or email bootcamp@iqb.rutgers.edu.

Parking

Familiarize yourself with the parking arrangement that applies to you:

- **Faculty/Staff:** Park in faculty/staff lots as usual (shown in yellow-green on the map on the back cover).
- **Students with Parking Permits:** Park near Richardson and Nichols Apartments (shown in pink on the map).
- **Visitors:** Pull up at the Drop Off point in the circle in front of CABM (see back cover) and call 848-445-0103 for your week-long parking permit.

Sakai

Rutgers registrants, log in with your NetID. External registrants have been given access using the e-mail address provided on the IQB registration site.

If you have any complications, please contact Michelle Sanghera at Msanghera@iqb.rutgers.edu to request access.

RUTGERS BUSCH CAMPUS MAP

Center for Integrative Proteomics Research (Proteomics)

Parking with valid Faculty/Staff Permit

Parking with valid Student Permit

Bus Stop

