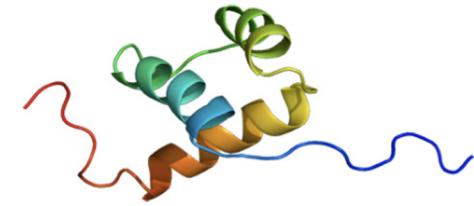


Bioinformatics and Systems Biology



BISB Graduate Program Welcome - 2021

Terry Gaasterland, Program Director

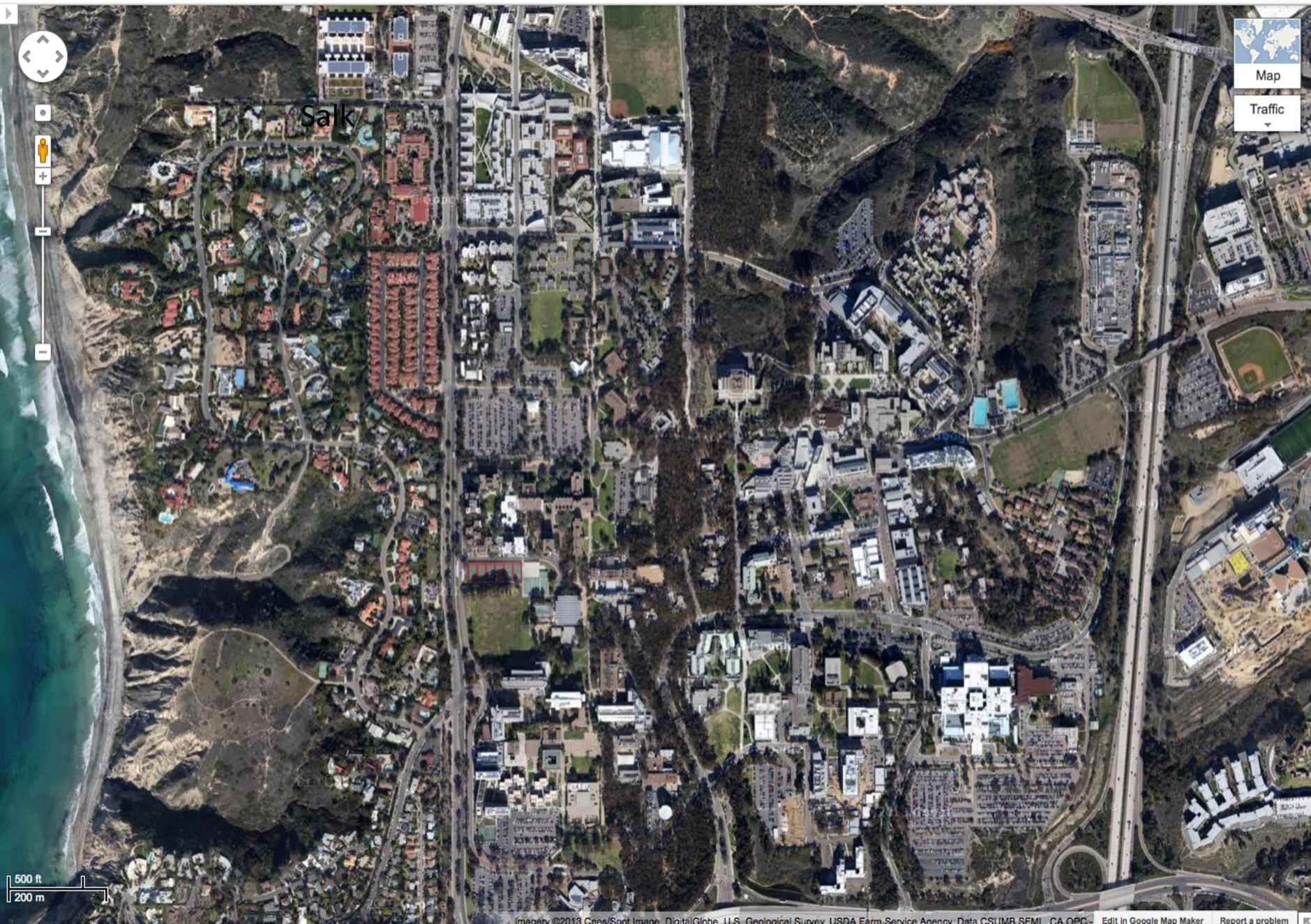
Gene Yeo & Trey Ideker - Program Co-Directors

Lucila Ohno-Machado – BMI Track Director

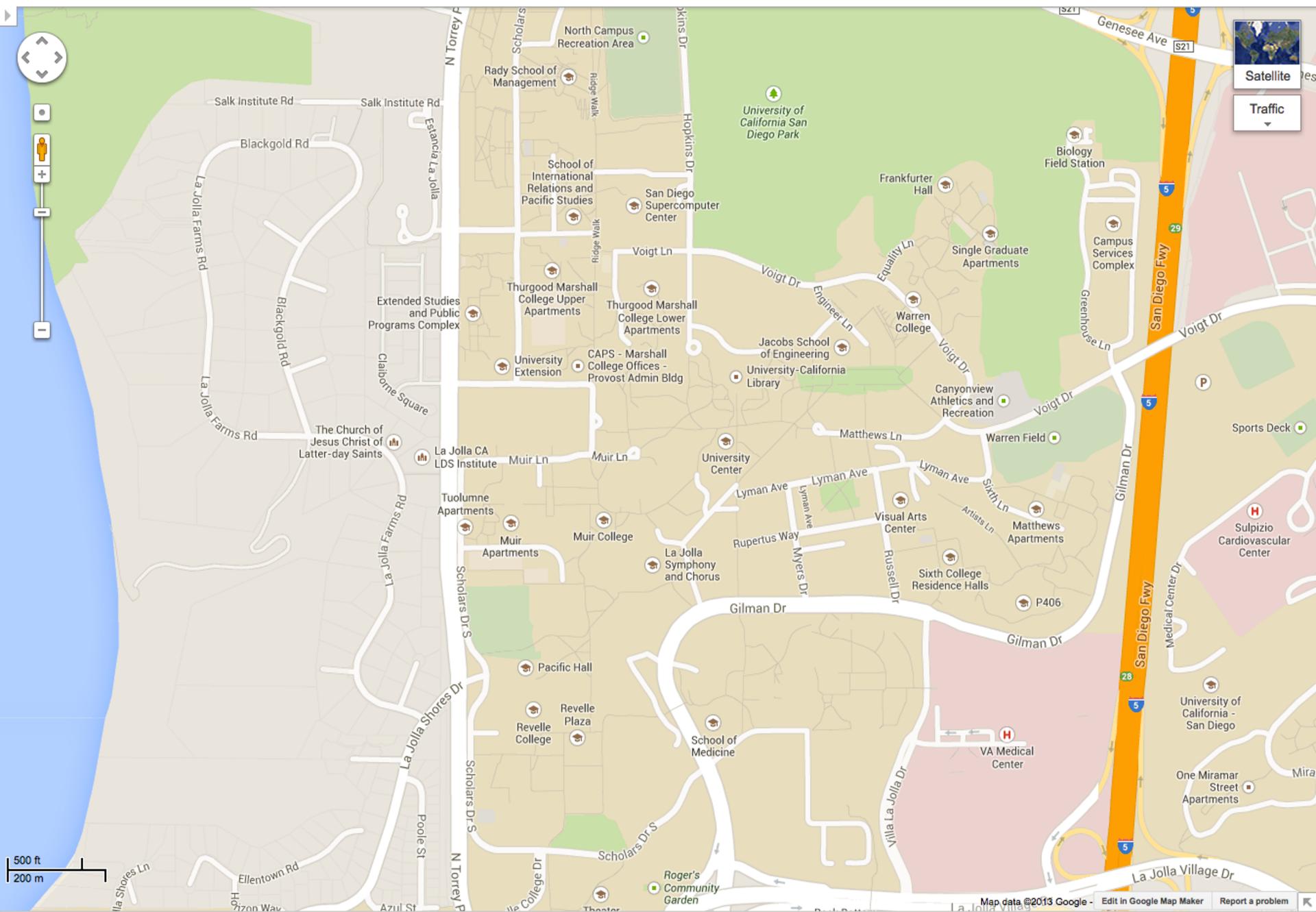
Fran Perez Estrada – Graduate Program Coordinator



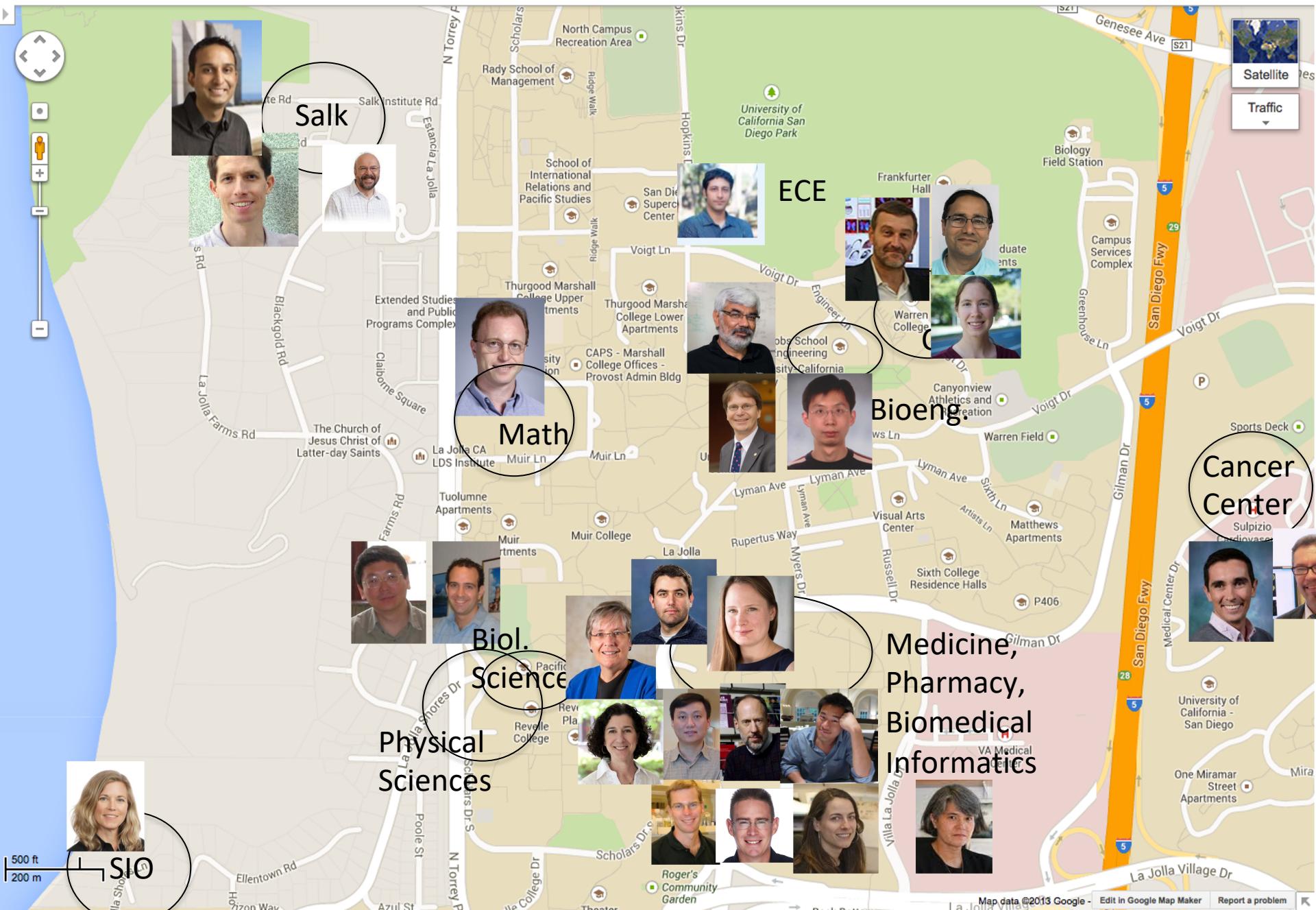
BISB - Diverse, Interdisciplinary Program



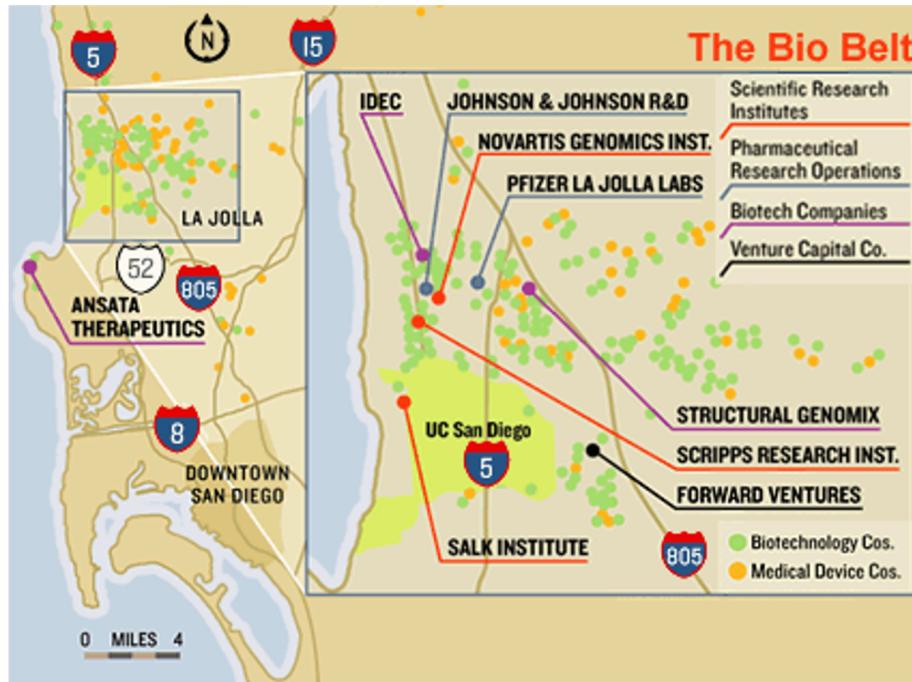
BISB - Diverse, Interdisciplinary Program



BISB - Diverse, Interdisciplinary Program



BISB - Diverse, Interdisciplinary Program



Johnson & Johnson INNOVATION | **JLABS**



History

- 2000** Interdisciplinary Bioinformatics PhD program founded
- 2001** Bioinformatics Training Grant (NIH T32) funded
(PI: Shankar Subramaniam). Renewed 2006, 2011
- 2008** Program renamed “Bioinformatics and Systems Biology” (**BISB**)
6 Schools: *Engineering, Medicine, Biology, Physics, Pharmacy, Scripps Institution of Oceanography*
- 2012** Added Biomedical Informatics (BMI) 2nd Track

100+ students graduated

Directors

- 2001-2008 Shankar Subramaniam (Bioeng)
- 2008-2012 Pavel Pevzner (CSE) / Alex Hoffman (Chem)
- 2012-2013 Alex Hoffman (Chem) / Vineet Bafna (CSE) + Lucila Ohno-Machado (BMI)
- 2013-2017 Vineet Bafna (CSE) / Bing Ren (CMM)
- 2017-2019 Vineet Bafna (CSE) / Trey Ideker (Med)
- 2019- Trey Ideker (Med) / Gene Yeo (CMM)/ Terry Gaasterland (SIO)

Mission

"The ability to harvest the wealth of information contained in biomedical Big Data will advance our understanding of human health and disease; however, lack of appropriate tools, poor data accessibility, and insufficient training, are major impediments to rapid translational impact."

*-NIH BD2K initiative
(Phil Bourne, former
BISB Faculty Member)*

Train students in the interdisciplinary fields
of Bioinformatics, Computational and
Systems Biology.

Training at a glance

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Bootcamp	✓					
Core courses (3+1)		✓	✓			
Research Rotations		✓				
Electives (~4)+Ethics(1)		✓	✓			
Quals			✓			
TAship			✓	✓		
Advance to Candidacy				✓		
Colloquium		✓	✓	✓	✓	✓
IDP/seminars		✓	✓	✓	✓	✓
Defense					✓	✓

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Colloquium		✓	✓	✓	✓	✓
IDP/seminars		✓	✓	✓	✓	✓
Defense					✓	✓

1st Year Rotations

- Each Quarter Year 1
- Goal 1: Learn how to define a problem, lay out a plan of attack, generate results, evaluate next steps
- Goal 2: Connect with 1 to 3 labs, find a PI/Advisor, gravitate toward a lab to join by summer
- Each Quarter:
 - Rotation Proposal + Rotation Report

Rotation Projects

- *The goal of a rotation is to select an academic advisor.* Take it seriously.
- **Questions:**
 - Is the PI looking for an advisee?
Will they support you financially if it works out?
 - Do the projects excite you?
Do they match with your career goals? Remember, rotation project may not be your thesis project.
 - Read some of the PI's publications.
Can you see yourself doing similar work?
 - Talk to some of the lab members.
Does the PI's working style match your own?

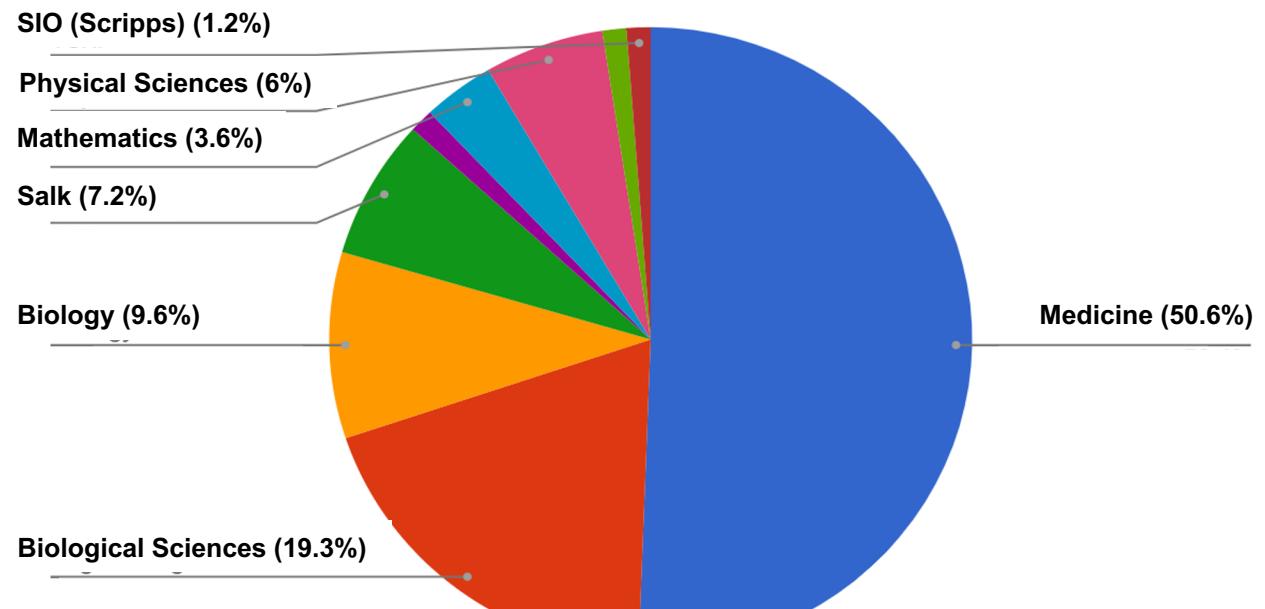
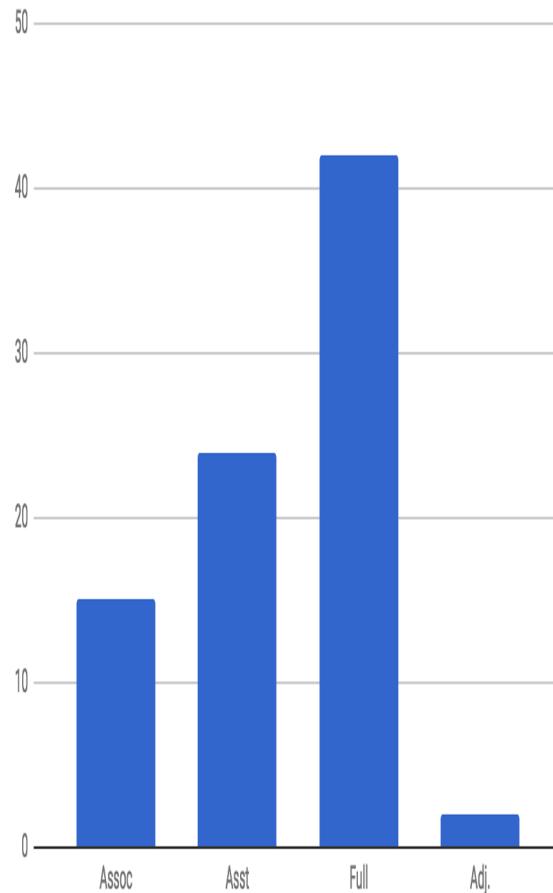
2nd Year Qual Exams

- Spring Quarter Year 2
- Goal: Evaluate, are you are ready for independent research?
- You will propose a research project, show preliminary data with significant progress, answer questions and lead discussion about your problem area
 - Challenges
 - Open questions
 - What have others done? What is missing so far?

Faculty Committees

- Steering Committee (Gaasterland)
- Curriculum Committee (Tesler)
- Outreach and Student Affairs (Tesler)
- Admissions and Recruitment (Carter, Tesler)
- Diversity (Bafna)
- Training Grant (Subramanium/
Gaasterland/Bafna)
- Fellowship Training (Carter)
- Fellowship Selection (Mali)

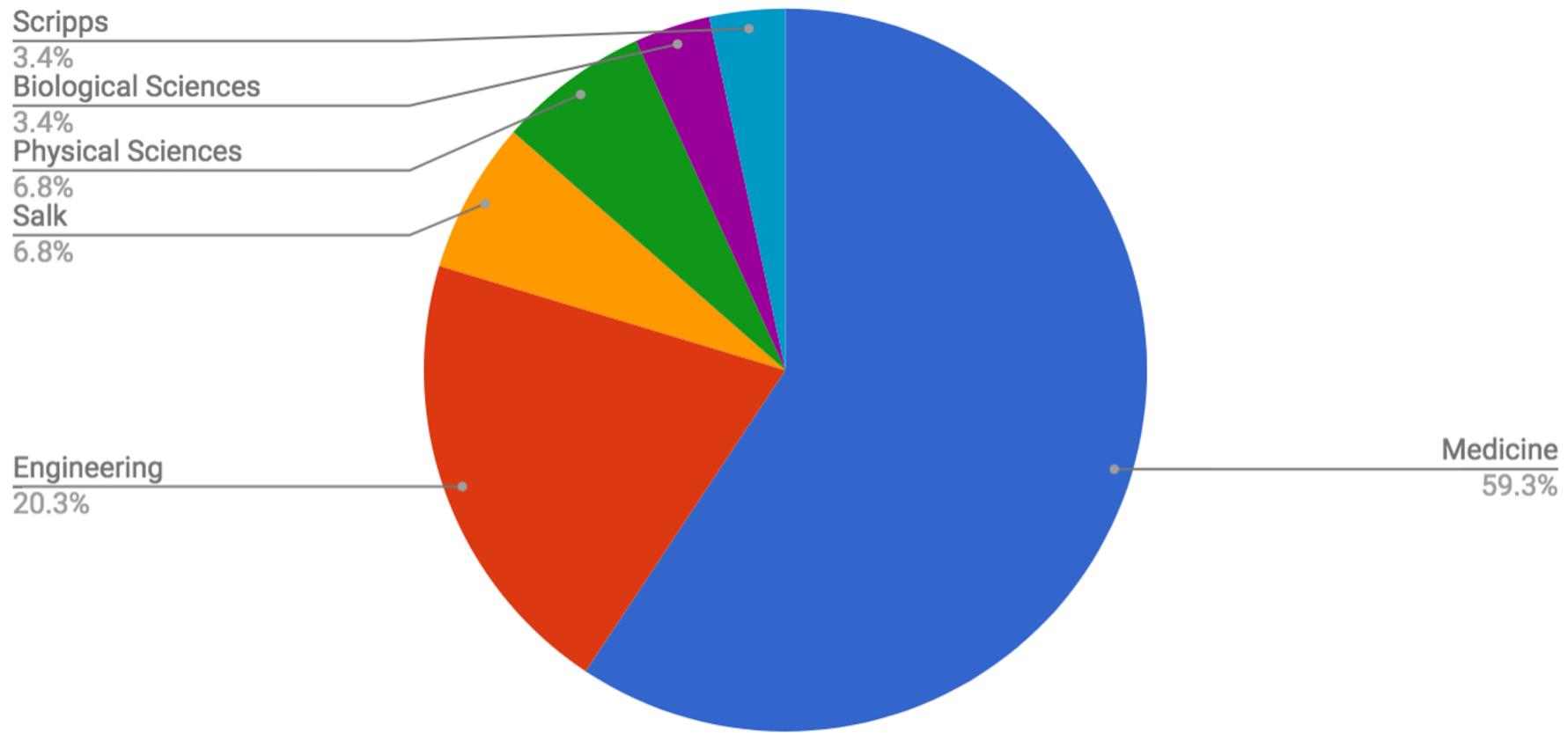
BISB Faculty Affiliation – by School (83)



Faculty Engagement

- Admissions
- Research rotations
- Teach core and elective classes
- Serve on qualifying exam committees
- Thesis advising and senate exam committees
- Thesis committees
- Participate in visit day, colloquium series, student seminars and journal clubs

BISB Students – Lab Home Schools



Funding (typical one year snapshot)

		Budget	
Admin Budget	SVCAA	\$15,000	
	Biol Sciences	\$14,250	
	JSOE	\$14,250	
	Physical Sciences	\$14,250	
	Medicine	\$19,250	
	Expenses	-\$77,000	
	Net	0	
Student Budget	Training Grant	\$845,000	includes “overhead”
	Block Grants	\$214,996	
	Salk	\$49,000	
	GSGEI	\$224,128	

Key people

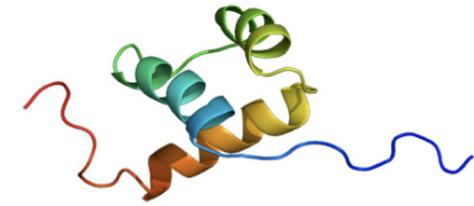
- Graduate Coordinator: Fran Perez Estrada
- Finances & Operations: Elizabeth Soos
- Steering Committee: 15+ faculty
- Admissions Chairs: Glenn Tesler
- Carter
- Admissions Committee: Hannah
- BISB Students 30+ faculty

Alumni in ACADEMIA - examples

Name	Position	Institution/Company
Markus Covert	Professor	Stanford University
Sourav Bandyopadhyay	Asst. Professor	UC San Francisco
Nathan Price	Professor	Institute for Systems Biology
Jason Papin	Asoc. Professor	University of Virginia
Shaojie Zhang	Assoc. Professor	Univ. Central Florida
Samuel Payne	Senior Scientist	Pacific Northwest Natl Laboratory
Ines Thiele	Asst. Professor	University of Iceland
Degui Zhi	Asst. Professor	University of Alabama
Ali Bashir	Asst. Professor	Mount Sinai Medical School
Noah Zaitlen	Asst. Professor	UC San Francisco
Gary Hon	Asst. Professor	UT Southwestern
Albert Hsiao	Asst. Professor	UC San Diego
Juan Rodriguez	Instructor	Weill Cornell Medical College

Alumni in INDUSTRY - examples

Name	Position	Institution/Company
Nitin Udpa	Bioinformatics Scientist	Illumina
Stephen Tanner	Senior Director	Illumina
Sam Payne	Senior Scientist	Pacific NW labs
Ryan Kelly	Senior Scientist	Illumina
Derren Barken	Bioinformatics Scientist	Prometheus
Han-Yu Chuang	Bioinformatics Scientist	Illumina
Jan Schellenberger	Scientist	ID Analytics
Jocelyne Bruand	Scientist	Illumina
Markus Kinsella	Scientist	Pacific Biosciences
Sid Selvaraj	Founder, CEO	Arima Genomics, Inc.
Vipul Bhargava	Senior Scientist	Janssen Labs (J&J)
Roy Ronen	VP	Data4Cure
Matt Schulz	Scientist	Human Longevity Inc
Boyko Kakradov	Scientist	Human Longevity Inc



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