Staff Introductions

Carolyn Lawrence-Dill (trifflid@iastate.edu) BCB Chair

TBD, Associate BCB chair

Trish Stauble (tastaub@iastate.edu) BCB Program Coordinator
Program Overview

One of the first Bioinformatics Ph.D. programs in the US

With 50 Ph.D. students, one of the largest and strongest Bioinformatics Ph.D. programs in the US

About 15 core teaching faculty, with 76 program-associated faculty (from 18 departments) with research projects in BCB

‘Wet’ and ‘dry’ lab research experiences and mentoring by a major and co-major professor (each in a different discipline)
Major Research Thrusts

Structural Bioinformatics
Comparative Genomics
Transcriptomics
Proteomics
Predictive Plant Phenomics
Metabolomics
Machine Learning
Image Processing
Biological Data Mining, modeling and analytics
Outcomes from the BCB Program

Over 100 BCB alums have positions spanning the gamut including:

• 15 tenure-track professors
• 40 in postdoctoral or research associate positions
• 40 in industry – biotech start-ups, pharmaceutical or agricultural
• 5 in government positions
Examples of outcomes for BCB Alums

• Professor at Texas A&M Univ; College Station in Poultry Science
• Bioinformatics Director at Collaborative Health Initiative Research Program (CHIRP), Uniformed Services Univ., Bethesda, MD
• Staff Scientist, Roswell Park Cancer Inst; Buffalo NY
• Research Scientist; Dana Farber Cancer Inst., Boston
• Senior Research Associate at Oregon Health and Science University/Visiting Scientist at Fred Hutchinson Cancer Research Center
Sources of funding

First Year – Research assistantship (RA) provided by program

Afterward – RA (typically) arranged with major professor

Teaching assistantships (typically) arranged with home department

Competitive fellowships funded by internal as well as external sources as available
Questions on funding?
Training timeline

Year 1. Research rotations, finding a home
Years 1-2. Core Curriculum

Year 2. Define dissertation project, additional coursework
Year 2-3. Preliminary examination

Year 5. Ph.D.

Progress monitored by the program - interviews with BCB Chair
Getting Started

Each BCB student is advised by a temporary advisor during the first year.

Temporary advisor helps choose courses, and arrange research rotations.

Carolyn Lawrence-Dill is the current temporary advisor---additional members of the Supervisory Committee may assist.
Background coursework requirements

New students are expected to have a solid undergraduate training in at least one of the foundation disciplines: biology, mathematics, computer science, or statistics.

New students take background courses in computer science, statistics, or biology during the first year to complete their basic training.

In consultation with their advisor, they will register for the courses which will best prepare them for the Core Curriculum.
Background coursework

Computer Science
- Programming and Data Structures (Com 227, 228)
- Discrete Computational Mathematics (Com S 230)

Statistics
- Stat 341, 342 or Stat 401, 447, or 430

Biology
- Genetics (Biol 313)
- Evolutionary Biology (Biol 315)

Mathematics
- Calculus and Differential Equations (Math 165, 166, 265)
- Linear Algebra
Core course requirements

I  BCB 567  Bioinformatics Algorithms
II BCB 568  Statistical Bioinformatics
IV BCB 570  Systems Biology

Advanced Biology Requirement - Examples include:

GDCB 511  Molecular Genetics
AnSci 556  Current Topics in Genome Analysis
EEOB 561  Evolutionary and Ecological Genomics
EEOB 563  Molecular Phylogenetics
Bioinformatics and Computational Biology

Math 265
ComS 230
ComS 227
ComS 228
Stat 341
Stat 342
Biol 313
Stat 401
Stat 447
Stat 430
Math 265
ComS 230
ComS 227
ComS 228
Stat 341
Stat 342
Biol 313
Stat 401
Stat 447
Stat 430
Biol 315

Bioinformatics I
Bioinformatics II
Bioinformatics IV
Adv Biology

Backgrd
Core
Sample Course Plans
For new students

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<th>Year 1</th>
<th>Fall</th>
<th>Spring</th>
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<td>ComS 227/228</td>
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<td>Stat 401/430</td>
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<td>Faculty Seminar</td>
<td>or Stat 447</td>
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<td>Rotations</td>
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<th>Year 2</th>
<th>Bioinformatics I</th>
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<td>Stat 430</td>
<td>Bioinformatics IV</td>
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## Sample Course plans

Students Needing ComS or Stat Background, but with strong Biology background

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Sample Course plans

Students Missing Biology Prerequisites, but with strong Computer Science background

Year 1

**Fall**
- Biol 313
- Stat 430
- Faculty Seminar
- Rotations

**Spring**
- Biol 315
- Bioinformatics II
- Rotations

Year 2

- Bioinformatics I
- Adv Electives

- Adv Electives
- Bioinformatics IV
Questions on Training Timeline or Coursework?
Finding a home

Take Faculty Research Seminar (BCB 691)
Arrange Research Rotations
Choose Major and Co-major Professors
Your major professor’s department becomes your home department.
Major and co-major professors are responsible for research supervision, mentoring, and assistantship support.
Arrange Research Rotations

- Rotations include ‘wet’ and ‘dry’ lab research experiences
- Goal of rotations is to help identify major and co-major professors (each in a different discipline)
- Rotations will be completed with submission of evaluation form
Research Rotation opportunities which were available last year:

- Madan Bhattacharyya, Agronomy
- Anne Bronikowski, EEOB
- Hui-Hsien Chou, GDCB
- Julie Dickerson, ECPE
- Carolyn Lawrence Dill, GDCB
- Karin Dorman, Statistics
More Research Rotation opportunities available with following faculty:

- Oliver Eulenstein – Computer Science
- Iddo Friedberg - VMPM
- Xun Gu - GDCB
- Eric Henderson - GDCB
- Heike Hofmann – Statistics
- Matt Hufford - EEOB
- Robert Jernigan - BBMB
More Research Rotation opportunities available with following faculty:

- Dennis Lavrov – EEOB
- Allen Miller – Plant Path and Microbiology
- Walter Moss – BBMB
- Marit Nilsen-Hamilton – BBMB
- Julien Roche – BBMB
- Ravi Singh – Biomedical Sciences
- Jonathan Smith – Math
And More -- Research Rotation opportunities:

- Guang Song – Computer Science
- Geetu Tuteja – GDCB
- Nicole Valenzuela - EEOB
- Amy Vincent – USDA ARS
- Erik Vollbrecht – GDCB
And More -- Research Rotation opportunities:

- Justin Walley – Plant Path and Microbiology
- Steve Whitham – Plant Pathology and Microbiology
- Roger Wise – Plant Pathology and Microbiology
- Zhijun Wu – Mathematics
- Eve Wurtele – GDCB
- Edward Yu – Astronomy and Physics
Research Rotation Timetable

Deadline for submitting Rotation Planning form Sept 8

Approximate dates for rotations:
- Rotation #1 Sept 12 – Oct 30
- Rotation #2 Oct 31 – Dec 16
- Rotation #3 Jan 9 – Feb 24

There is time for a 4th rotation:
- Feb 27 – April 13

Deadline for final lab decision April 13
Deadline for filing Home Department form April 28
Questions on research rotations and finding a home?
Research and Dissertation

Research Rotations
Thesis proposal and Preliminary Examination
Research and journal and conference publications
Ph.D. Thesis
Thesis Defense
Additional training opportunities

Participation in scientific conferences and symposia
Internships
International experiences
Questions on Training Requirements?
Resources – Graduate College

Professional Development

• **Individual Development Plan (IDP) to** provide a planning process that identifies your professional development needs and career objectives.
• **Regular professional development workshops** centered on core competencies; teaching, research, communication, career, and wellness.
• ISU is a member of **CIRTL** a consortium of 22 universities that makes available a broad range of online courses, webinars and discussions to prepare our graduate students to be better TAs and future faculty members.
Resources for Professional Development
Graduate College

• Center for Excellence in Learning and Teaching
• Preparing Future Faculty
  • We have one of the largest Preparing Future Faculty programs in the country. PFF prepares graduates for faculty careers through a combination of seminars, mentoring, and practical classroom and departmental service experiences.
• Center for Communication Excellence
• Writing a Teaching Philosophy Statement
• Learn @ ISU
Resources

Biology IT
Collaboration with the colleges of Life Sciences and Agriculture
Work closely with the University’s Information Technology group
Provides access to computational hardware, software
Have high performance network attached storage
Collaborate/consult with researchers on complex technology problems

ISU Library – Heather Lewin, Science & Technology Librarian
http://instr.iastate.libguides.com/bcb
BCB program resources

BCBGSO
This student-led group coordinates many BCB activities and research opportunities. Get involved and benefit! The current president of the organization is under consideration.

BCB Office
Trish can and does answer a lot of questions - I can help as well
Read through the BCB Graduate Student Handbook
Use the on-line version: www.bcb.iastate.edu/Handbook.html