Fall 2014

BCB Graduate Program

Introduction

www.bcb.iastate.edu
Staff Introductions

Karin Dorman  (kdorman@iastate.edu) BCB Program Chair

Dennis Lavrov (dlavrov@iastate.edu) BCB Associate Chair

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

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

With about 60 Ph.D. students, one of the largest and strongest Bioinformatics Ph.D. programs in the US

About 15 core teaching faculty, but over 70 program-associated faculty (from more than 15 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

Bioinformatics
Computational Molecular Biology
Structural and Functional Genomics
Macromolecular Structure and Function
Metabolic and Developmental Networks
Integrative Systems Biology
Information Integration and Data Mining
Biological Statistics
Mathematical Biology
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
Year 2-3. Preliminary examination
Year 5. Ph.D.

Years 1-2. Core Curriculum
Year 2. Define dissertation project, additional coursework

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.

Karin Dorman and Dennis Lavrov are the current temporary advisors—additional members of the Supervisory Committee may assist.

An important choice to make is Track 1 and Track 2.
Background coursework - Track 1 versus 2

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 often take background courses in computer science, statistics, or biology during the first year to complete their base training.

Some students may be prepared for the Core Course curriculum. In consultation with their advisor, they will register for the core courses immediately and are Track 1. If there are classes a student needs to be prepared for the Core, these students are Track 2.
Background coursework

Computer Science
  Programming (Com S 207, 208 or 227, 228)
  Discrete Mathematics (Com S 330)
  Database Management Systems (Com S 363)

Statistics
  Stat 341 and/or Stat 430

Biology
  Genetics (Biol 313)
  Molecular Cell Biology and Biochemistry (Biol 314)
  Evolutionary Biology (Biol 315)

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

I  BCB 567  Fundamentals of Genome Informatics
II BCB 568  Advanced Genome Informatics
III BCB 569  Structural Genome Informatics
IV BCB 570  Computational Functional Genomics and Systems Biology
GDCB 511  Molecular Genetics
Sample Course plans
Well-prepared Students (Track 1)

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<tr>
<th>Year 1</th>
<th>Fall</th>
<th>Spring</th>
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<tr>
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<td>Bioinformatics I</td>
<td>Bioinformatics II</td>
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<td>Stat 430</td>
<td>GDCB 511 (or Com S 363)</td>
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<td>Rotations</td>
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| Year 2    | Bioinformatics III (Com S 363) | Bioinformatics IV                           |

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## Sample Course plans

### Students Missing Computer Science Prerequisites, but with strong Biology background (Track 2)

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<td>Bioinformatics III</td>
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<td>Biol 313</td>
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<td>BBMB 301</td>
<td>GDCB 511</td>
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<th>Year 2</th>
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<td>Bioinformatics III</td>
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<td>Biol 315</td>
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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 available with the following faculty:

- Steven Cannon - Agronomy and USDA ARS
- Michael Cho - Biomedical Sciences
- Julie Dickerson – Electrical and Computer Engr.
- Drena Dobbs – GDCB
- Karin Dorman - Statistics
More Research Rotation opportunities available with following faculty:

- Xun Gu - Genetics, Development and Cell Biology
- Eric Henderson - Genetics, Development and Cell Biology
- Robert Jernigan – Biochemistry, Biophysics and Molec Biol
- Dennis Lavrov – EEOB
- Allen Miller – Plant Pathology and Microbiology
And More -- Research Rotation opportunities available with following faculty:

- Basil Nikolau – BBMB
- Tom Peterson Genetics Development and Cell Biology
- Donald Sakaguchi Genetics Development and Cell Biology
- Patrick Schnable, Agronomy
- Taner Sen Genetics Development and Cell Biology
- Guang Song, Computer Science
- Eric Underbakke, BBMB
And More -- Research Rotation opportunities:

- Nicole Valenzuela - Ecology, Evolution and Organismal Biology
- Erik Vollbrecht - Genetics Development and Cell Biology
- Roger Wise – Plant Pathology and Microbiology
- Eve Wurtele - GDCB
Research Rotation Timetable

Deadline for submitting Rotation Planning form: Sept 23

Approximate dates for rotations:
- Rotation #1: Sept 25 – Nov 20
- Rotation #2: Nov 27 – Feb 5
- Rotation #3: Feb 12 – Apr 9

There is time for a 4th rotation:
- April 16 – May 28

Deadline for final lab decision: May 15
Deadline for filing Home Department form: May 30
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

Bioinformatics and Computational Biology
Additional training opportunities

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

L.H. Baker Center for Bioinformatics and Biological Statistics
Organizes faculty research
Provides computer infrastructure
Home to computer support staff
Organizes campus-wide seminars and workshops

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

BCBLab
This student led group coordinates many BCB activities and research opportunities. Get involved and benefit! Sweta Roy is the current president of the organization.

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