Two new Programs of Study for the PhD in Biomedical Sciences
Distinct preparation (UG major, graduate degree, research experience)

Targeted outreach and marketing pre-application

Separate admissions committee

Curriculum tailored to specific preparation and objectives

Some requirements common to all (QE, RCR, TRAC, Dissertation Exam)
Currently Seven Programs, mostly thematic

- Biochemistry and Molecular Biotechnology
- Cancer Biology
- Immunology and Microbiology Program
- Interdisciplinary Graduate Program
- Neuroscience
- Bioinformatics and Computational Biology
- Translational Science Program

Common requirements & timeline, Program electives

- BBS 614 SIBR; Research Rotation
- BBS Electives; Research Rotations
- BBS Electives, BBS 602 QE; PREP; Thesis Research
- Q Exam; Thesis Research
- RCR, Seminars, Thesis Research
- Dissertation Completion

Spring Yr 1 BBS Students affiliate with one program

UMBRELLA STUDENT PROGRAM DISTRIBUTION

- NEU 14%
- TSP 3%
- BCB 7%
- BMB 7%
- CA 6%
- IMP 17%
- IGP 46%
New BBS Umbrella Program: Systems, Computational, and Quantitative Biology (SCQB)

Leadership
- Hyun Youk DSB
- Robert Brewster DSB
- Manuel Garber GCB

Membership
- DSB Faculty
- GCB Faculty
- Others by Approval of SCQB Executive Committee

Training in quantitative and systems level approaches for student with undergraduate preparation in life sciences, little exposure to quantitative sciences

Meet high enthusiasm, demand in student community demonstrated by exposure in core course, high enrollment in existing Systems Biology course (BBS746), joining DSB for thesis research

Develop proficiency in computer programming in the context of biological systems

Focus on mathematical analyses and modeling of biological processes

Current BCB Program will be absorbed by SCQB
# SCQB Academic Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>BBS614 SIBR Research Rotation</td>
<td>BBS746 Any BBS Elective Research Rotations</td>
<td>Thesis Research</td>
</tr>
<tr>
<td>2</td>
<td>BBS ### Quantitative Modeling and Analysis*&lt;br&gt;BBS706/741 or any other BBS elective/BBS602 QE Prep</td>
<td>Q Exam Thesis Research</td>
<td>Thesis Research</td>
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<td>3</td>
<td>RCR, Seminars Thesis Research</td>
<td>Thesis Research, Seminars</td>
<td>Thesis Research</td>
</tr>
<tr>
<td>4-6</td>
<td>Seminars, Research, and Completion</td>
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</tbody>
</table>

### SCQB Courses
- BBS706 An Empirical Introduction to Statistical Modeling (Existing)
- BBS741 Advanced Topics in Bioinformatics (Existing)
- BBS### Quantitative Modeling and Analysis (New)

*Course Directors: Hyun Youk, Manuel Garber
Other Elements of the training program

- All program faculty must teach in courses, serve on advisory and exam committees
- Students attend and present in weekly trainee research seminar
- Students attend quarterly meeting with Program Directors
- Students attend quarterly meeting with program faculty

Morningside Graduate School of Biomedical Sciences Process to Date

- Proposal presented to GSBS Assembly May 2023
- New Course Quantitative Modeling and Analysis provisionally approved by GSBS Curriculum Committee October 2023
- Program Approved by GSBS Assembly October 2023
- Pending final approval, Program can accept new students in June of 2024
Biophysical, Chemical, and Computational Biology (BCCB) Pathway

- Training future scientists for working at the interfaces between life science and physical sciences, computer science, and engineering
- Enhance visibility of Morningside Graduate School of Biomedical Sciences to prospective applicants whose undergraduate preparation is in physical sciences, mathematics, computer science, engineering
- Tailor applicant evaluation criteria to non-biology STEM majors
- Build curriculum to develop proficiency with biological concepts, and applications of physical and computational sciences to biomedical questions
# BCCB Program Leadership

## Executive/Admissions Committee

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Specialty</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Brewster</td>
<td>(physics)</td>
<td>DSB</td>
</tr>
<tr>
<td>Niko Grigorieff</td>
<td>(physics)</td>
<td>RTI</td>
</tr>
<tr>
<td>David Grundwald</td>
<td>(physics)</td>
<td>RTI</td>
</tr>
<tr>
<td>Song Jie</td>
<td>(chemist)</td>
<td>Orthopedics</td>
</tr>
<tr>
<td>Elinor Karlsson</td>
<td>(bioinformatics)</td>
<td>BIB / PMM</td>
</tr>
<tr>
<td>Francesca Massi</td>
<td>(chemist)</td>
<td>BMB</td>
</tr>
<tr>
<td>Stephen Miller</td>
<td>(chemist)</td>
<td>BMB</td>
</tr>
<tr>
<td>James Munro</td>
<td>(physics)</td>
<td>MAPS</td>
</tr>
<tr>
<td>Manojkumar Saranathan</td>
<td>(physics)</td>
<td>Radiology</td>
</tr>
<tr>
<td>Zhiping Weng</td>
<td>(bioinformatics)</td>
<td>GCB</td>
</tr>
</tbody>
</table>

**Director**  
Celia Schiffer BMB

**Co-Director**  
James Munro MAPS
# BCCB Academic Plan

<table>
<thead>
<tr>
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<th>Spring</th>
<th>Summer</th>
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<tbody>
<tr>
<td></td>
<td>BCCB ### Biophysical, Chemical, Computational Strategies in Biological Research*&lt;br&gt; BBS 706/741 Research Rotation(s)</td>
<td>BCCB ### Biophysical, Chemical, Computational Strategies in Biological Research&lt;br&gt; Approved BBS Elective</td>
<td>Thesis Research</td>
</tr>
<tr>
<td>Year 2</td>
<td>Elective: BBS 706/741, Other Approved BBS Elective</td>
<td>Qualifying Exam&lt;br&gt; Thesis Research</td>
<td>Thesis Research</td>
</tr>
<tr>
<td>Year 3</td>
<td>Common Yr 3 Requirements&lt;br&gt; BCCB Seminars, Thesis Research</td>
<td>BCCB Seminars, Thesis Research</td>
<td>Thesis Research</td>
</tr>
<tr>
<td>Years 4-6</td>
<td>Seminars, Research, and Completion</td>
<td></td>
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</tbody>
</table>

*Course Directors: Francesca Massi, James Munro

**Approved BBS Electives**

- BBS706 An Empirical Introduction to Statistical Modeling
- BBS715 Chemical Biology
- BBS716 Molecular Biophysics
- BBS717 Structural Biology
- BBS719 Cellular Biochemistry
- BBS741 Advanced Topics in Bioinformatics
- Others TBD
Other Elements of the training program

- Pre-research 1:1 tutorial with assigned academic advisor (not thesis advisor)
- Monthly Journal Club/Research Seminar
- BCCB Retreat
- 1:1 Advising with academic advisor to develop academic plan

Morningside Graduate School of Biomedical Sciences Process to Date

- Proposal presented to GSBS Assembly October 2022, Revised May 2023
- New Course provisionally approved by GSBS Curriculum Committee October 2023
- Program Approved by GSBS Assembly October 2023
- "Quiet" (no marketing/social media) outreach, review of eligible applicants in current cycle for admission Fall 2024
- Pending final approval, GSBS will market and recruit for 2024/25 Admissions Cycle