

## **A Versatile Interdisciplinary Joint Ph.D. Degree Program Encompassing Quantitative Biomedicine and Partnering Graduate Programs**

Graduate students in the physical, computational, mathematical, and life sciences have the opportunity to add an interdisciplinary component to their academic and research training. The graduate program in Quantitative Biomedicine (QB; formerly Computational Biology and Molecular Biophysics), administered by the Institute for Quantitative Biomedicine at Rutgers (IQB@R; formerly administered by the BioMaPS Institute for Quantitative Biology), is at the nexus of this interdisciplinary foundation and provides a joint Ph.D. degree program that promotes a seamless interface with other core disciplinary graduate programs. The QB program offers both individual and joint Ph.D. and M.S. (and/or M.Phil.) degrees, and is one of a limited number of graduate programs nation-wide that trains students at the interface of the quantitative sciences and experimental and theoretical biology and biomedicine.

The philosophy behind the QB graduate program is to extend core disciplinary training so as to include broader, interdisciplinary experience. In this way, there is no sacrifice in the level of core disciplinary expertise. In fact, many QB students end up satisfying all of the academic requirements of a disciplinary graduate degree (such as a degree in chemistry, physics, or mathematics) on their way to the QB degree. Likewise, most joint students in the partnering graduate programs only require two or possibly three additional interdisciplinary academic courses (often in the form of mini-courses) to provide the complementary coursework needed to poise the Joint Ph.D. student for future leadership roles. One course required of all Joint Ph.D. students is the 2-credit, 2-week Winter Session Interdisciplinary Quantitative Biology Boot Camp, which embodies the value of approaching science in an interdisciplinary, collaborative manner. The Joint Ph.D. graduate program does not change the requirements set by the primary graduate program, allowing students to concentrate fully on research earlier along in their degree timeline and still graduate in a timely fashion. The Joint Ph.D. program is thus ideally poised to provide a flexible mechanism for awarding interdisciplinary degrees.

**What is a joint Ph.D. degree?** A joint Ph.D. degree is a single degree that satisfies two Ph.D. programs. The Joint Ph.D. degree program represents a new model for interdisciplinary graduate education at Rutgers that offers great benefits for students and faculty in partnering graduate programs (PGPs).

**About the program:** The Joint Ph.D. program was designed to adopt different disciplinary tracks that are aligned with those of the PGPs. It is expected that joint degree students will be engaged in at least one interdisciplinary research project as part of their thesis research. There may be nominal academic requirements by the QB degree program beyond those of the PGP, which will be decided in conjunction with the graduate program director or associate director. The 2-credit, 2-week Interdisciplinary Quantitative Biology Boot Camp is required of all Joint Ph.D. students and is described on the [IQB@R](#) website. Beyond the PGP's programmatic requirements, assessment as to progress toward Ph.D. candidacy is evaluated by the student's thesis committee, which includes at least two members of the QB faculty (who are, in many cases, members of both the PGP and QB).

### **Important advantages of the joint Ph.D. degree program:**

- Enriches graduate education of students
- Improves chances for attracting external funding (e.g., IGERT, GAANN, T32, etc.)
- Establishes a new, flexible model for excellence in interdisciplinary graduate education

### **How the QB joint degree program works:**

- Students enroll in one of the partnering graduate programs (PGP).
- Students enroll in the QB program (usually within the first or second academic year).

- Once accepted into the joint degree program, a joint degree track is selected to coincide with that of the PGP conferring the disciplinary degree. (This track follows the degree requirements for the PGP and sets the format for the qualifying examination and the final thesis defense.)
- While all diplomas for graduate degrees from Rutgers are designated as “Doctor of Philosophy” without further specification of the discipline, the formal degree that will be awarded and reflected on the transcript will be the joint degree, designated as “Ph.D. in <PGP> and Quantitative Biomedicine.”

**Course Requirements:**

- Students must satisfy ALL of the course requirements for the PGP degree.
- Students must satisfy any additional course requirements deemed appropriate by the QB graduate program director or associate director. The additional course load is typically 1-2 courses in total.

**Format for the Qualifying Examination and the Ph.D. Defense:**

- The format for the qualifying examinations in the joint Ph.D. degree will be defined by the PGP.
- At least two QB faculty members will be part of the student committee. (If the QB faculty members are PGP faculty as well, there will be no change to PGP faculty requirements. If this is not the case, the graduate program directors will determine the best composition of faculty members for these committees.)
- The PGP and QB faculty will independently assess student performance, providing separate recommendations for candidacy into their respective Ph.D. programs and for granting of a Ph.D. Possible outcomes are that the student can earn: 1) a joint degree in QB and the PGP, 2) a degree in PGP only, 3) a degree in QB only (if a QB advisor agrees to be responsible for the student), or 4) no Ph.D. degree.
- This format will apply to the granting of M.S. and/or M.Phil. degrees as well.

**Admissions:**

There will be two mechanisms by which graduate students can enter the Joint Ph.D. program.

**Direct entry method:**

- Students will direct their graduate applications to the PGP admissions committee for evaluation, requesting consideration for a joint degree (generally in the essay section).
- After acceptance by the PGP, the QB admissions committee will render its acceptance decision.
- Acceptance by both programs will result in admittance to the Joint Ph.D. program.
- Acceptance by the PGP alone will result in a traditional one-discipline education.

**Delayed entry method:**

- Students will apply to the Joint Ph.D. program later in their first or second year of graduate school.
- After choosing a QB co-advisor (if the student’s PGP advisor is not already a member of the QB graduate faculty), students will be evaluated based on a brief personal statement, the student’s original graduate school application material, and a summary of the student’s graduate courses and grades.