

## Administrative Activities Review (AAR) Integrated Bioscience PhD Program

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### 1. Basic Facts and Description of the Unit

- a. **Mission:** Integrated Biosciences (IB) was proposed as a PhD Program on the idea that *'...the study of complex biological systems is best approached by incorporating many perspectives, bringing together a diversity of complementary disciplines to unravel the complexity that is biology...'* Faculty in the program aim to train scientists that incorporate thinking in *'widely different disciplines, approaches and techniques.'* The UA IB program is internationally unique in its inclusion of subjects such as engineering, polymer science, physics, computer science and biomimicry. The mission of IB is to train the next generation of scientists to prepare for the interdisciplinary research environment of the future.

#### Goals:

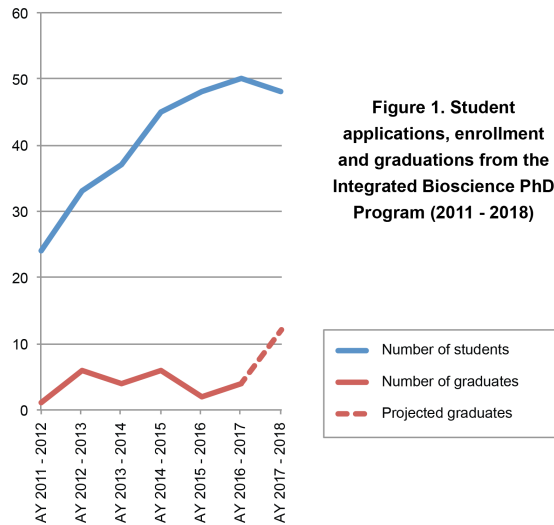
- a. The near-term goals of the program are to:
- Stabilize the funding provided by the graduate school, sufficient to provide the necessary TAs for the Biology Department
  - Develop an in-progress MS to increase SSI share
  - Continue to promote the program, increasing the number and quality of applicants
- b. The long-term goals of the program are to:
- Increase the cross-disciplinary nature of the program, with increasing numbers of students studying with investigators in other departments across campus
  - Increase our relationship with external partners, including industry and the Cleveland Clinic
  - Increase the size and quality of the program to meet faculty needs
- b. **Services:** The administrative services to IB are provided by an administrative load to a faculty member as the Director of Integrated Bioscience. The work effort of the administrator is split between administrative (student contracts, student academic and disciplinary paperwork, student advisement, working with university council, managing courses within IB, and managing program paperwork), and program duties (including meeting with faculty, meeting with regional partners, meeting with other academic units, media enquiries, meeting with prospective students and donors, and program development). There is no formal administrative assistance to the program director.

**Critical partners** – On campus the critical partners are Biology, Polymer Science, Biomedical Engineering, Chemistry, Computer Science, and BRIC. There is a formal overlap with the Biology Department as IB students currently provide all TA services in Biology. The Biology Department administrative assistant provides some assistance with filing and the website. Currently 16 of the 17 PhD students on Biomimicry Fellowships are working toward their degrees through IB.

**Customers** – There are currently 48 students and 37 TT faculty within the program. Other customers include on average over 30 student applicants, and at least 30 undergraduate students carrying out biological problems (3100:497), honors research and research experiences mentored by the IB graduate students. Other customers include the 17 different regional

companies where students are hired, along with regional institutions where the students who graduate the program work as post-doctoral fellows or faculty.

**Key performance analysis** – Our performance is measured through the number of applicants, the numbers of students graduating within 5 years, and the total graduation rate. Our current graduation rate is 81%. The numbers of enrolled students/graduates is shown in Figure 1.



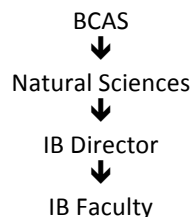
**Brief assessment** – the program has the potential to grow and there is an increasing desire for IB students by faculty across campus. We have an increasing number of students supported by RA funds, with projections for this number to increase in the future. There is also growing demand for access to the Biomimicry Program, allowing us to recruit many quality students to meet this need.

The Director of Integrated Bioscience is provided an honorarium to cover 6 hours of administrative work on IB per month; however, this does not reflect the workload, which is routinely in excess of 40 hours/month.

**c. Resources:**

**Personnel:** The IB Program falls under the Natural Science Division of the Buchtel College of Arts and Sciences. Biology program needs 36 TAs to meet current teaching needs (and significantly more for the new biomedical degree), although IB currently only has 21 TA lines (of which 7 are supported directly by the Dean of Arts & Sciences). The TAs within the program carry out critical teaching duties in the laboratory component of the large courses within Biology. This includes lab preparation, contact hours, additional comeback hours that allow students to stay on target with laboratory exercises, office hours, exam preparation and grading, and grading of homework.

**Organizational chart:**



**Financials:** The expenditures are listed below. Prior to FY2017 the IB director duties were assigned to the Chair of Biology and no separate stipend existed.

|                  | FY14 | FY15 | FY16 | FY17    | FY18    |
|------------------|------|------|------|---------|---------|
| Director         | \$0  | \$0  | \$0  | \$6,000 | \$6,000 |
| Operating Budget | \$0  | \$0  | \$0  | \$0     | \$0     |

**Equipment and technology:** As a cross-disciplinary research program, the equipment and technology resides in the home department/research laboratory of the member faculty. IB does not manage or maintain any equipment.

**Space:** No space is dedicated to IB.

## 2. Future Plans

- a. Potential Changes:** There are a number of opportunities for growth that could dramatically strengthen IB with investment. These include:

*Provide IB with its own budget* - The lack of an operating budget puts the program at a significant disadvantage compared to institutions such as Kent State, as we are not able to advertise, have recruitment days, or even travel to undergraduate institutions to recruit for the program (for example, we were invited to visit John Carroll University, but we were not even provided funds to cover the cost of gas. Funds should also be provided that allow IB program activities during the semester, such as covering some travel expenses for students to attend conferences, bringing in speakers and even printing posters for presentations at national meetings.

There is a significant opportunity for IB to include researchers at both the Cleveland Clinic and NEOMED to mentor PhD students. In addition to mentoring these students, it also provides a unique opportunity for our undergraduate students to carry out experiential research at these biomedical research institutions. Not only would this dramatically strengthen our Pre-med program (where students are specifically looking for research opportunities in biomedical fields, particularly genetics), but it would also provide increased opportunities for honors students. To strengthen these collaborations, we need to hire more faculty within Biology with biomedical expertise that work within relevant fields.

- b. Trends:** The 2017 Ohio Bioscience Growth Report has identified a large and growing bioscience industry within Ohio, with 3,994 bioscience companies and facilities within the state adding over 9,000 jobs between 2015-2017. This bioscience industry employs over 75,000 Ohioans, with over \$5.68 billion in paid salaries (an increase of 24%) over the last decade. Cleveland and Akron lead the state in the number of bioscience jobs, with 1,295 companies within the region (representing more than 30% of all state-wide bioscience jobs). It is therefore likely that there will be an increasing demand within Northeastern Ohio for skilled workers prepared for innovative jobs in the biosciences.