



Four Year Report (2023)

Biotechnology Graduate and Undergraduate Programs (reviewed 2018-19)

A. Summary of Review

1. This review was conducted under the terms and conditions of the IQAP approved by Senate on May 25, 2016.
2. The academic programs offered by the Centre for Biotechnology which were examined as part of the review were:
 - PhD
 - MSc
 - BSc (Honours)
 - BSc (Honours) Co-op
 - BSc with Major
 - BSc (Pass)
3. The Review Committee consisted of two external reviewers: John Vederas (University of Alberta) and Joelle Pelletier (University of Montreal) and an internal reviewer, Wendy Ward (Brock University).
4. The site visit occurred on March 19-21, 2019.
5. The Final Assessment Report was approved by Senate on October 9, 2019.

6. The reviewers assigned the programs the following outcome categories:

Program(s)	Excellent Quality	Good Quality	Good Quality with Concerns	Non-Viable
PhD	X			
MSc	X			
BSc (Honours)	X			
BSc (Honours) Co-op	X			
BSc with Major	X			
BSc (Pass)	X			

7. The next review of the graduate and undergraduate programs in the Centre for Biotechnology will be in 2026/27.

B: Recommendations

Recommendation #1

If space permits, the formation of an undergraduate “Biotechnology Club” with a room allocation could further enhance communication among students in this program.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation. The Committee expects that the Centre is best-positioned to determine strategies for an effective Biotechnology Student Club and a suitable meeting space.

Implementation Plan (1st Priority)

Responsible for approving: Centre
 Responsible for resources: Centre
 Responsible for implementation: Centre
 Timeline: Dean of Mathematics and Science to report by the end of academic year 2019/20

Actions Taken	Year Action Started	Year Action Completed
Action #1 Discuss this idea with present club members.	2019	2019
Action #2 Form new Brock Chemistry Club.	2019	2020
Action #3 Provide ongoing encouragement to students to join clubs.	2019	0

Explanation of Actions Taken, Status and Results:

While there isn't currently an undergraduate "Biotechnology Club" at Brock University there is a club "Molecular Research Technologies Club" that is open to Biotechnology undergraduates. We have had discussions with members of the club about how best to encourage more first-year students to get involved. Providing dedicated space to the club is difficult but registered undergraduate clubs can book rooms for the duration of the term when they are not in use for teaching. Further to provide additional resources for undergraduates the "Brock Chemistry Club" was created, and Biotechnology students are encouraged to participate in this club.

Recommendation #2

A plan for replacement of senior Biology and Chemistry faculty who may consider retirement in the next years should be considered.

ARC Disposition of the Recommendation

ARC considers the recommendation to plan for faculty renewal to be accepted and in the process of implementation. The Committee recognizes that hiring decisions lie outside of its purview and expects that the Centre will proceed through normal channels of advocacy for faculty resources.

Implementation Plan (1st Priority)

Responsible for approving: Centre
 Responsible for resources: Centre
 Responsible for implementation: Centre
 Timeline: Dean of Mathematics and Science to report by the end of academic year 2019/20

Actions Taken	Year Action Started	Year Action Completed
Action #1 Strike Committees in both Biology and Chemistry to plan for faculty renewal.	2019	2021
Action #2 Biology and Chemistry to meet to discuss plans for faculty renewal.	2019	0

Explanation of Actions Taken, Status and Results:

This recommendation is being implemented. Because the faculty in the Centre are appointed to either Biology or Chemistry the plans for faculty replacement must be developed within the respective departments. Both departments have met and subsequently hired several new replacement faculty over the past three years. In the Chemistry Department, Physical Chemists Dr. Divya Kaur Matta and Dr. Jianbo Gao, in addition to Analytical Chemist Vaughn Mangal were hired in 2022. Currently, efforts are underway to hire one replacement faculty for the Organic Chemistry division and it is anticipated this new position will be filled in early 2023. In the Biology Department, Biologists Dr. Ian Patterson, Dr. Kiyoko Gotanda, Dr. Stephen Glasgow and

Dr. Jim Willwerth were recently hired. In addition, two brand new ½ hires: YiFeng Li (Cross-appointment with Computer Sciences) and Alonso Zavafer (Cross-appointment with Engineering) were hired.

Recommendation #3

We suggest prioritizing acquisition of modern instrumentation to give an edge to the teaching labs: fermentation and modern automation.

ARC Disposition of the Recommendation

ARC considers the recommendation to plan for the acquisition of modern instrumentation to be accepted and in the process of implementation. The Committee recognizes that equipment purchase decisions lie outside of its purview and expects that the Centre will proceed through normal channels of advocacy for these resources.

Implementation Plan (1st Priority)

Responsible for approving:	Centre
Responsible for resources:	Centre
Responsible for implementation:	Centre
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2019/20

Actions Taken	Year Action Started	Year Action Completed
Action #1 Acquire funding for purchasing modern instrumentation.	2020	0
Action #2 Hold meetings with the Chemistry department to discuss what instrumentation will be purchased.	2019	0

Explanation of Actions Taken, Status and Results:

In prioritizing the acquisition of modern instrumentation over the past three years we applied for and received Fed Dev funding to support establishing a state-of-the art testing, prototyping and early-stage manufacturing centre at Brock. This equipment in part is being made available for student training. Further in 2021 we drafted two CFI grant proposals to support the purchase of much need equipment for the Chemistry and Biology departments. Unfortunately, these CFI grant proposals were not internally selected by the Brock administration to go out for review by the respective Canadian governmental funding agencies.

Recommendation #4

An additional group orientation during 1st year, prior to entering the undergraduate Biotechnology program could be helpful for new students. This could help students be proactive about seeking support of the guidance person when they need it and for planning future years.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation.

Implementation Plan (1st Priority)

Responsible for approving: Centre
 Responsible for resources: Centre
 Responsible for implementation: Centre
 Timeline: Dean of Mathematics and Science to report by the end of academic year 2019/20

Actions Taken	Year Action Started	Year Action Completed
Action #1 Hold meetings in this upcoming year to discuss the creation of an additional group orientation during 1 st year, prior to entering the undergraduate Biotechnology program.	2019	0

Explanation of Actions Taken, Status and Results:

The Centre is working with Chemistry and Biology Academic Advisors and undergraduate club members to explore ways that such a session could be offered.

C. Unit Summative Analysis and Evaluation**1. To what extent has the Centre achieved the improvements suggested by the reviewers?**

The Biotechnology Centre in conjugation with the Chemistry and Biology Departments has made important progress in achieving the improvements suggested by the reviewers. For one, replacement faculty for retiring senior Biology and Chemistry faculty were acquired. Second, in prioritizing the acquisition of modern instrumentation we applied for CFI and Fed Dev funding. These efforts resulted in funding of the Fed Dev grant application and the monies from this award were used to support establishing a state-of-the art testing, prototyping and early-stage manufacturing centre at Brock. In contrast, funding was not secured from CFI as these proposals were not internally selected by the Brock administration to go out for review, while the requested infrastructure requested in these CFI proposals is absolutely required. It is our hope that revised versions of these CFI proposals will be sent out to Canadian governmental funding agencies in 2023-2025 and funded. Lastly, we have worked to create undergraduate clubs which are enhancing communication among students.

2. What overall impact has it had on the Centre's programs?

The improvements suggested by the reviewers have helped to identify potential areas of improvements for making the Biotechnology program more successful. Accordingly, we appreciate these suggestions and have worked to implement them into the program. The overall impact of these suggestions is hard to gauge, however, the outcomes have been positive.

3. Is the Centre adopting a process of continuous quality improvement for its programs?

Yes, the Centre is continually adopting processes for quality improvement. This action is being realized through departmental meetings to address areas of concern and/or discuss ideas for implementing new directions for adding value and quality to our programs. Further undergraduate and graduate thesis committee meetings provide another forum for quality improvement, by way of improving the skills and knowledge of our students. In addition to these efforts, is improving the research potential of our students and the program as seen through publications, research funding, conference presentations, etc. We are also implementing protocols to curb issues of student misconduct which have risen sharply since the COVID 19 pandemic. Of course, finally we welcome reviewer suggestions for improving the quality of the Biotechnology program.

4. How well do the programs now align with Brock University strategic priorities?

The Biotechnology program is well in accord with the Brock University strategic priorities. We continue to build research capacity across the University that is enhancing the life and vitality of our local region and beyond. In achieving this goal, we support a culture of inclusivity, accessibility, reconciliation, and decolonization that is providing a transformational and accessible academic and university experience. Further we continue to improve our program with a strong focus upon research and graduate student recruiting in conjunction with strengthening the learning experience of students at all levels.

5. How does this review and its results position the programs as the Centre moves into the next review cycle?

This review and its results have positioned the Biotechnology program at a strong strategic point for moving forward into the next review cycle. Having acted upon the suggestions of the reviewers the Centre was able to (1) secure much needed new faculty to replace retiring senior Biology and Chemistry faculty, (2) acquire critical modern instrumentation for supporting state-of-the-art testing, prototyping and early-stage manufacturing centre, and (3) enhance communication among students through group orientations and club activities. Moving forward, the Biotechnology Centre in the next review cycle hopes to secure funding for purchasing additional modern instrumentation that is still needed. The Centre is also working to foster partnerships with local industry that are beneficial for both Brock University as well as researchers and students, while elevating student learning and offering a transformational and accessible academic and university experience. Lastly, we will continue to strive to cultivate a welcoming environment for all individuals at Brock that embraces inclusivity, accessibility, reconciliation, and decolonization.

D. ARC Final Summary

In final summary of the 2018-2019 cyclical academic review of the programs offered by the Centre for Biotechnology, ARC has determined the following:

1. That the Reviewers' Recommendations have been addressed satisfactorily.
2. That the Centre has established a direction for next steps as it prepares for the next review cycle.
3. That the Centre has achieved a broad-based, reflective, and forward-looking self-assessment.