

**UNIVERSITY COLLEGE CORK**

**NATIONAL UNIVERSITY OF IRELAND, CORK**

**PERIODIC REVIEW**

**SCHOOL OF MICROBIOLOGY**

**ACADEMIC YEAR 2016**

**April 2016**

## PRG Members

Name	Affiliation	
1. Dr. Evelyn Doyle	School of Biology and Environment Science	University College Dublin
2. Dr. Elizabeth Gebruers (Chair)	Department of Physiology (Retired) & Staff Ombudsman	University College Cork
3. Professor Alan McCarthy	Institute of Integrative Biology	University of Liverpool
4. Mr. William McCarthy	3yr year student	University College Cork

## Introduction

A periodic review of the School of Microbiology was held on 6<sup>th</sup> – 8<sup>th</sup> April 2016. The timetable for the visit is provided in Appendix A. The Peer Review Group (PRG) had sufficient time to meet the Heads of School, College, staff, students and other relevant stakeholders of the School but would have appreciated the allocation of more time on day 2 for the meetings with students and to prepare the exit presentation. The meeting with the stakeholders could have been scheduled for the first day when the PRG had more time. While the PRG appreciated the fact that they had the opportunity to meet with PhD students who were at different stages of their PhD programme, the group could have been chosen to represent a broader range of research groups from across the School. The PRG would like to record that all of the interviews and meetings with staff, students, College representatives and stakeholders were both congenial and discursive, enhancing the review process.

The School's contribution to the research income of the College is outstanding. The PRG discussions with representatives of the College confirmed that the School is held in high esteem, regarded as both student focused and very well managed. The School has a well-deserved international reputation, which is recognised both within UCC and by external regional stakeholders. The School produces high calibre graduates who make an important contribution to the national economy. This is particularly impressive from a complement of 13 full-time members of academic staff. This performance can only be sustained by appointment of additional staff (both academic and technical), in tandem with the necessary accommodation at the earliest possible opportunity. To maintain the School's position at the forefront of research and teaching provision at UCC, the age profile of the staff demands that **formal succession planning is a priority**, with appropriate attention paid to gender balance, now recognised as important in providing positive role models for undergraduate and postgraduate students.

## General observations on the documentation

The PRG was very impressed by the SER and judged that a great deal of time and thought had been spent in ensuring that it was a well-structured, concise and informative document. The balance between the SER and the accompanying appendices provided all of the necessary information that the review group needed in order to complete its task.

The SWOT analysis, while valuable, was somewhat out of date. However, the majority of the details were current. Given the detailed attention paid to the SER and the inclusion of a Strategic Plan, the SWOT analysis was therefore considered to be of limited importance.

The Strategic Plan identified key actions in the areas of undergraduate teaching programmes, postgraduate education, research and human capital development. It was a useful addendum to the SER.

The benchmarking exercise against the University of Sheffield and the University of Dundee was excellent and thorough. The analysis was honest and open, and the institutions were well chosen. The comparison was meaningful, the report balanced and the PRG found it useful. The overall quality of the BSc Microbiology offered by UCC is broadly comparable to the benchmarked institutions. The breadth of the curriculum at UCC compares favourably with those in the benchmarked institutions and there are no apparent gaps in the curriculum. Overall the total contact hours with students are similar across the programmes, but the level of practical training is significantly higher in Sheffield and Dundee than at UCC. This is most evident in the foundation years. The institutions offer alternative types of final year project, which may inform the School's current discussion on this topic. The PRG did note that the staff teaching load at UCC is significantly higher than at either of the benchmarked Institutions.

## **Academic provision**

Academic provision is located correctly on the NFQ, and the School of Microbiology produces high quality graduates in all of its programmes.

The School objective is to offer academically challenging degree programmes that provide a rewarding and stimulating educational experience to students, whilst delivering high quality graduates to meet the needs of employers and other stakeholders in society.

The School of Microbiology offers a diverse range of undergraduate and postgraduate programmes. It is responsible for the Honours BSc in Microbiology, shares responsibility for the BSc in Genetics with the School of Biochemistry and Cell Biology and contributes to many other programmes including Biomedical Science and Food Science. The School also delivers MSc degrees in Food Microbiology, Bioinformatics & Computational Biology, Biotechnology and Molecular Cell Biology with Bioinnovation. They also contribute service teaching in Food Business, Process Engineering, Pharmacy, Public Health, Nursing and Graduate Medicine.

There are currently 46 students in final year BSc Microbiology and 28 in BSc Genetics. All BSc Microbiology students and 50% of the BSc Genetics students must be provided with final year projects.

The staff student ratio is ca.1:29.6, which is above the average in UCC. This presents challenges to this small group of staff for the delivery of high quality innovative teaching programmes.

The allocation of students to degree programmes through CK402 is uneven. Microbiology seems to accommodate a disproportionately large number of these students.

There are currently ca. 90 postgraduate students in the School, of whom approximately 70 are studying for a PhD.

The School of Microbiology has a Strategic Plan and engages in periodic SWOT analysis. These exercises have been used to identify areas for new developments and refinement of

existing practice. The School has made a number of changes based on these analyses in the recent past, including the development of a new BSc degree programme in Biotechnology (from September 2016) and has modified the 4<sup>th</sup> year curriculum in Microbiology. At postgraduate level, the MSc Food Microbiology programme was revised and problem based learning approaches were adopted. Other developments include the provision of podcasts and the initiation of online course delivery.

All staff contribute equally to the teaching programmes. There do not appear to be any significant teaching workload management issues. The laboratory classes are extremely well organized and run by a Teaching Assistant under the direction of the relevant staff member, and supported by a cohort of demonstrators. The Teaching Assistant also provides a very valuable mentoring role for Year 1 and 2 students; this makes a significant positive impact on the student experience. It is obviously important that the School continues to support this role. The technical staff are long-serving and highly regarded by students and staff alike.

The PRG identified issues with CK402 (the main CAO entry route for Microbiology students) which had been raised in the SER and reinforced in meetings with staff and students. The loss of practical training in Year 1, due to high student numbers and lack of resources, is a major concern. **The PRG fully support the School's proposal of a revised CK402 dependant on the provision of centralised and integrated laboratory teaching facilities for 1st and 2nd Year 'Biological Sciences' streams. The PRG recognise that such provision takes time, and they strongly urge the University to engage with the Head of School to find an interim solution as a matter of urgency.**

## **Student progress and attainment**

Student progress is excellent, with 98% of the 3<sup>rd</sup> year intake attaining an Honours degree

There has been a 30% increase in students entering 3<sup>rd</sup> year in the last 2 years, and this is significantly above the agreed quota

Demand for the BSc in Microbiology remains high. CAO points for CK402 (the main entry route for Microbiology) have been increasing over the last few years

90% of students attained a second class Honours grade two or higher in the final degree, with 24% achieving a 1H. This pattern is similar to previous years

**The PRG meeting with external stakeholders i.e, local employers in the Life Sciences sector, confirmed that UCC Microbiology graduate quality is continuing to improve year on year.**

The PRG were provided with a very comprehensive list of external examiner reports for all programmes and over a number of years. In all cases, they were complimentary.

## **Student Experience**

The School promotes research-led teaching in year 3 and 4. The School of Microbiology received the highest rating in the 2015 Research Quality Review and this impacts significantly on teaching quality and student experience.

The College reported to the PRG that staff in the School were student focused and this was confirmed by the PRG's interview with representatives of both the undergraduate and postgraduate student body, who universally praised teaching quality in the School and described the staff as very approachable. Undergraduates, and in particular postgraduates, appreciate the support of technical staff.

### Undergraduate

Undergraduate students in the degree programmes delivered by the School of Microbiology were happy overall with their courses and appreciated the high quality education provided. The delivery of the Biomedical Sciences degree programme between UCC and CIT is commendable and appreciated by the students, but is hampered by communication issues. **The PRG recommends that this is reviewed.**

Students identified the gap in academic expectation between Years 2 and 3. They particularly identified the introduction of general skills such as essay writing, oral presentations and scientific paper evaluation in Year 3 for the first time. The PRG commend the School's ambition to explore innovative teaching approaches in years 1 and 2 but are aware that this is resource dependant.

The PRG agreed with representatives of 3<sup>rd</sup> and 4<sup>th</sup> year undergraduates that final year research project allocation should be revised to enable student choice. The students accept that project allocation in this manner, would be on a competitive basis.

Student numbers, if not managed appropriately, will have an impact on the student experience. The School should continue to raise this at College level to ensure their ambition for a high quality student experience is sustained. This will require additional resources. The staff have highlighted in the SER "infrastructure strained to breaking point due to increased student numbers". The impact is already being felt by the removal of practicals from first year, due to space constraints. This also causes unacceptable levels of duplication in practical class delivery in year 2. This reinforces the PRG's recommendation above, concerning the provision of new high quality and sufficiently large undergraduate practical laboratories comparable with those found elsewhere on campus.

The School is to be commended on the innovative teaching approaches it has already introduced, such as the Small World Initiative that was a great success as communicated to the PRG during interviews with representatives of the student body.

In general, assessment at undergraduate level is too focused on final examinations and this was reiterated in interviews with the student groups. **The PRG strongly recommend that the staff review current assessment modes and introduce new methods of assessment to complement final examinations.** Care should be taken to ensure that the student workload does not become excessive.

Undergraduate students identified the need for more discipline-focused career advice beyond that provided by the UCC career service. It would be appropriate for the School to offer this, and external stakeholders indicated to the PRG that they would be enthusiastic about becoming involved, even at an early stage in the undergraduate student experience. Many of the external stakeholders at the meeting with the PRG were UCC Microbiology graduates and represent an excellent resource that is currently under used. Both undergraduate and postgraduate students would appreciate more information about career opportunities and relevant experience. The PRG observed that the students needed to become more focused on general skills acquisition in addition to Microbiology discipline specific training, and academic staff should endeavour to facilitate that.

### Postgraduate

The PhD student cohort in the School communicated to the PRG that their overall experience is very positive. They have formed a committee and are keen to become involved in the activity of the School. The PRG encourages the School to enable them to contribute wherever possible. The PRG has identified postgraduate involvement at School level as an important development that will enable the students to identify with the School as well as with their own research groups. Furthermore, given the size of the PhD student cohort there needs to be a more structured approach to their management by the School. For example, PhD students need to know how to access advice and information at School level and beyond that provided by their immediate supervisors. This would also apply to the School's PhD students located off-campus.

While the School appears to be fully compliant with Health and Safety legislation, awareness of this important issue was uneven among the students interviewed. The increase in the number of students, especially at PG level requires a more centralised approach. **The PRG suggests the formation of a School Committee for Health and Safety to assist the School Safety Officer in his work. This committee should include representatives from the postgraduate students to ensure clear lines of communication on this important issue.**

Currently, PhD students are required to take at least 3 named compulsory modules as part of their training programme. They have identified a range of modules available at UCC and would like to have the flexibility to choose appropriate modules. The PRG agree with them entirely, and their proposed choice of alternative modules was coincidentally reinforced by the meeting with external stakeholders. **The PRG recommend that PhD students choose modules in consultation with their supervisor and the School Director of Postgraduate Research, with the number of named compulsory modules kept to a minimum.**

### **Staff development**

The staff view is that the School is well managed at a personal level. Decision making is fair and transparent, as is workload management. The PRG is impressed with the level of collegiality and the staff are a coherent and mutually supportive group who have a good relationship with their Head of School. It is important that this is maintained and sustained going forward, and feeds into the succession planning process.

The PRG commend the fact that many staff have pursued university teaching qualifications.

It is clear that the School supports the efforts of staff to attain promotion and there appears to be contentment with the local management of staff development. However, opportunities for promotion are rare and there is a significant degree of dissatisfaction with the overall process at University level. Although financial constraints interfere with career progression, **the PRG recommends to the University that meaningful feedback is provided to all unsuccessful candidates for promotion. This will impact very positively on staff morale and there is evidence that it is being poorly delivered by the University currently.**

One approach the School should adopt to maintain and boost staff morale at a time when promotions are limited is to explore imaginative ways of recognising those staff who make outstanding contributions to the core activities of the School.

## **Innovation and good practice**

The management of the School is inclusive, fair and transparent.

The introduction of innovative teaching approaches such as the Small World Initiative, is to be applauded in view of the significant budgetary and staffing level challenges faced by the School and the University.

The development of the BSc in Biotechnology commencing in September 2016 and involving a significant industry input for placement provision is eagerly anticipated by the undergraduate students. It may set a new standard for the School's other programmes and the PRG cautions that student expectation and outcome will need to be carefully managed.

The proactive approach of the School in developing plans to deal with high student numbers and improve the student experience in years 1 and 2 of the CK402 programme is another example of the School's concern for undergraduate wellbeing.

The strong collegiate nature of the School and the obvious commitment to their students and to world class research activity is striking.

The introduction of new research-led and practical based modules into the BSc Microbiology programme has attracted universal praise from undergraduate student representatives.

Expansion of the portfolio of taught masters programmes offered by the School is impressive.

The hosting of the IndieBio synthetic biology programme over the summer months is an example of innovative international outreach activity, notably dependent on an additional level of commitment from the School's technical staff.

## **Actions taken since last review**

The School provided the PRG with its annual monitoring reports and it was clear that all issues raised in the previous Quality Review, and under the School's control, had been addressed.

The PRG were disappointed, particularly in light of the School's continued outstanding performance in teaching and research, that recommendations made to the College in the 2004 Quality Review for additional staff provision to the School of Microbiology had not been implemented. This continues to be a pressing concern.

## **Recommendations made by the School of Microbiology SER**

These were:

Recruitment of at least three new lecturing staff based on increasing student numbers, new degree outlets, expansion of taught MSc programmes, and the urgent need for correcting the career stage and gender imbalance in the School's staff profile.

**The PRG strongly supports this recommendation and would suggest that these appointments are provided as soon as possible, particularly given the School of Microbiology's outstanding reputation in research and teaching and their continued highly significant contribution to the College of Science, Engineering and Food Science budget.**

Recruitment of three new Technical Officers to replace upcoming retirements and restore the School's full complement of 6 staff.

**The PRG strongly supports this as a necessary level of staffing essential to support the delivery of advanced practical training, especially at 3<sup>rd</sup> and 4<sup>th</sup> year Honours levels.**

Development of a new fully equipped Biosciences Laboratory Training Facility and reorganisation of first and second year Biosciences curricula to place a much stronger emphasis on the delivery of integrated practical training that is not sub-divided by discipline, but provides the foundation for all degrees in the Life Sciences.

**As discussed above under Academic Provision, the PRG strongly supports this as essential for the continued production of high calibre graduates that are competitive and can contribute to the regional and national economy.**

### **Recommendations by the PRG for consideration and response.**

1. The School should form a Safety Committee which is chaired by a permanent member of the academic staff and has representatives from the technical staff, PhD students and Postdoctoral researchers. The terms of reference of the committee should include the oversight of general School safety and report to the School management team.
2. The School should engage external stakeholders in their undergraduate degree programmes and postgraduate education, where appropriate. The School has a long standing relationship with many of the stakeholders and the PRG were very impressed with the esteem in which the School, staff and degree programmes were held by external stakeholders. The stakeholders all expressed a willingness to be involved in the various programmes via provision of activities such as career advice and student placements. These stakeholders, many of whom are graduates of the School, are a valuable resource and the PRG recommend the School explore ways in which they can best employ their obvious goodwill for the mutual benefit of the students, programme and the stakeholders themselves.
3. The School of Microbiology should, at the earliest opportunity, submit a formal succession plan to the College of Science, Engineering and Food Science. The plan should include new appointments (both early and mid-career) and address age and gender profile issues in a proactive manner.
4. The School should progress the proposed plan for centralised Teaching Laboratory facilities as a matter of urgency. This is essential for the maintenance and further development of a high quality CK402 programme. A formal plan, with appropriate costings, should be drawn up (with cognate Schools, if appropriate) and submitted to the relevant College authorities.
5. The School should continue with its development and introduction of innovative teaching approaches. The PRG is aware that this is resource dependent.
6. The School should take steps to embed the management of Ph.D. students at School level, in addition to the affiliation of students with research groups and institutes. The introduction of more flexibility in the choice of modules within the School's structured Ph.D. programmes should be a part of this process.
7. The School should take steps to introduce some level of choice for students in the selection of the final year Honours project. This will have a significant impact on the student experience.

8. The School should move away from complete reliance on formal lectures and final examinations primarily by introducing some element of continuous assessment. Again, this will impact positively on the student experience if carefully managed.

9. The College and University should find ways of rewarding the School's excellent achievement in research and teaching, including the recognition of individual staff contributions.

## Appendix 1

### SCHOOL OF MICROBIOLOGY

#### PEER REVIEW GROUP SITE VISIT TIMETABLE

#### In Summary

- Wednesday 6 April: The Peer Review Group (PRG) arrives at the River Lee Hotel for a briefing from the Quality Promotion Unit, followed by a meeting with the Heads of School and College.
- Thursday 7 April: The PRG meets with school staff, students and relevant officers of UCC and stakeholders. A working private dinner is held that evening for the PRG in order to work on the report.
- Friday 8 April: The PRG meets with the Head of School. An exit presentation is given by the PRG to all members of the School. External PRG members depart.

<b>Wednesday 6 April 2016</b>	
<b>Venue: Muskerry Room, 1<sup>st</sup> Floor, River Lee Hotel</b>	
12.00 – 13.30	Meeting of members of the Peer Review Group. Lunch and briefing by Ms. Aoife Ní Néill, Quality Promotion Unit. Group agrees final work schedule and assignment of tasks for the following day. Views are exchanged and areas to be clarified or explored are identified.
13.45 – 14.20	Meeting with Professor Paul Ross, Head of College
15.00 – 16.50	Private meeting of PRG for discussion.
16.50 – 17.50	Meeting Professor Gerald Fitzgerald, Head of School.
19.00	Dinner for members of the Peer Review Group & staff members of School of Microbiology Dr. Marcus Claesson Dr. Max Dow Professor Gerald Fitzgerald Professor Paul O'Toole Dr. Martina Scallan <b>Venue: The Weir Bistro, River Lee Hotel</b>

**Thursday 7 April 2016**

**Venue: Room 453, 4<sup>th</sup> floor, Food Science Building**

08.30 – 09.00	Convening of Peer Review Group
09.00 – 10.00	Meeting with staff of School of Microbiology <b>Venue: Pharmacy UG22/23</b>
10.15 – 10.55	Tea/coffee and private meeting of PRG
11.00 – 12.00	Tour of facilities
12.00 – 13.00	Private meetings with staff members of the School
13.00 – 14.00	Lunch
14.00 – 14.25	<u>Representatives of 3<sup>rd</sup> and 4<sup>th</sup> year students</u>  <u>3rd Year Microbiology</u> <ul style="list-style-type: none"><li>• Brian Corcoran</li><li>• Caitlin Desmond</li><li>• Jamie Donnelly</li><li>• Sinead Flynn</li><li>• Eibhlin Hanlon</li><li>• Emily Mulqueen</li><li>• Ruth Nagle</li></ul> <u>4th Year Microbiology</u> <ul style="list-style-type: none"><li>• Muhammad Arslan Ashfaq</li><li>• Cillian Hayes</li><li>• Stephanie Mannion</li><li>• Maire Murphy</li><li>• Christine Neville</li><li>• Caroline O'Carroll</li><li>• Thomas Roche</li></ul> <u>3rd Year Genetics</u> Kian Hearty  <u>4th Year Genetics</u> John McCarthy  <b>Venue: Room 453, 4<sup>th</sup> floor, Food Science Building</b>
14.25 – 14.50	<u>Representatives of Postgraduate students</u> <u>Research postgraduates</u> <ul style="list-style-type: none"><li>• Finbarr Buttimer</li><li>• Emer Kelly</li><li>• Noreen Lanigan</li><li>• Emily Power</li><li>• Ilias Theodorou</li></ul> <u>Taught Masters</u> <b>MSc Food Microbiology</b> <ul style="list-style-type: none"><li>• Adrian Fernandez</li><li>• Lisa McKenna</li></ul>

	<p><b>Msc Bioinformatics and Computational Biology</b></p> <ul style="list-style-type: none"> <li>• Rachel O'Carroll</li> </ul> <p><b>Venue: Room 453, 4<sup>th</sup> floor, Food Science Building</b></p>
15.00 – 16.00	Tea/coffee and private meeting of PRG
16.00 – 17.00	<p>Meeting with College Financial analyst and other officers, depending on the PRG's line of enquiry</p> <p>Ms. Carmel Cotter, College Financial Analyst</p>
17.15 – 18.00	<p>Meeting with stakeholders</p> <p>Mr. Paddy Barrett, Carbery Group  Dr. Tom Beresford, Teagasc Food Research Centre  Dr. Barry Kiely, CEO Alimentary Health  Mr. Mike McGorry, Janssen Research &amp; Development  Dr. David O'Sullivan, DePuy Synthes  Dr. Roy Sleator, Biological Sciences, Cork Institute of Technology  Dr Rob Phelan, EliLilly, Kinsale</p> <p><b>Venue: Staff Common Room</b></p>
19.00	<p>Working private dinner for members of the Peer Review Group to commence drafting of report.</p> <p><b>Venue: Tower Room, 1<sup>st</sup> Floor meeting room, River Lee Hotel</b></p>

<b>Friday 8<sup>th</sup> April 2016</b>	
<b>Venue: Room 453, 4<sup>th</sup> floor, Food Science Building</b>	
08.30 – 09.00	Convening of Peer Review Group
09.00 – 10.00	Meeting with Professor Gerald Fitzgerald
10.00 – 10.30	Private meeting of PRG
10.30 – 11.00	<p>Exit presentation to all staff, to be made by the Chair of the Peer Review Group or other member of Peer Review Group as agreed, summarising the principal findings of the Peer Review Group.</p> <p>This presentation is <u>not</u> for discussion at this time.</p> <p><b>Venue: Room 247, 2<sup>nd</sup> floor, Food Science Building</b></p>
11.00 – 13.00	Further work on drafting of the final report.
13.00 – 14.00	Lunch
14.00	Further work on drafting the report /agreeing next steps.
	Reviewers depart.