

TRINITY COLLEGE DUBLIN



Provost's Report to Council on the review of the School of Genetics & Microbiology

1. Introduction

This report presents the outcome of the first review of the School of Genetics & Microbiology. An external peer review visitation was undertaken from the 15th & 16th March 2010 by Professor David Hopwood, John Innes Research Institute; Professor Virginia Zakian, Princeton University and Professor Nigel Brown, University of Edinburgh. The internal facilitator was Professor David Grayson, School of Chemistry, Trinity College Dublin.

The report is based on (i) feedback from the External Reviewers received on the 3rd June 2010, (ii) a submission from the School of Genetics & Microbiology received on the 24th June 2010 and (iii) a submission from the Dean of the Faculty of Engineering, Mathematics & Science received on the 14th September 2010.

The main purpose of the School review is (a) to provide a structured opportunity for the School to reflect on its activities and plans for development, while benefiting from a constructive commentary by senior colleagues external to College; (b) to ensure that quality and standards in teaching, research and administration are being maintained and enhanced and that areas of concern in this regard are identified and addressed. Each School in College is reviewed systematically once every seven years.

2. Overview of the School

2.1 Aims and Objectives of the School

The School of Genetics and Microbiology was formed in 2007. It comprises two Departments – Genetics and Microbiology. Both Departments are research-led by academic staff and post-doctoral scientists with interests encompassing microbiology, genetics (including human genetics), computational biology, molecular biology, cell biology, medicine, systems biology, developmental biology, parasitology and evolution. The School is committed to preserving the independent identities of both Genetics and Microbiology at Trinity College and to facilitating both disciplines in further development in the future. At the same time the School seeks to maximize every opportunity for the exploitation of natural synergies between the two disciplines for mutual benefit and for the benefit of the biological sciences at TCD. The objectives of the School are to build on the international reputation of its research and teaching and to consolidate the position of the School as the national reference point for Genetics and Microbiology. To realise this vision, the School seeks to attract, support, motivate and retain outstanding staff and students, and to support and promote them, whether as students or staff, on the basis of (i) their interest and capacity in research and learning at the forefront of Genetics and Microbiology, and (ii) their abilities as researchers, as judged by international peers.

2.2 Programmes to which the School provides teaching

Undergraduate:

B.A. (Mod) degree in Genetics

B.A. (Mod) degree in Human Genetics

B.A. (Mod) degree in Microbiology

The School also provides service teaching to the degrees in Medicine, Dentistry and Pharmacy.

2.3 Research

Research interests in the Smurfit Institute include the follow areas:

- Cancer Transcriptomics
- Molecular Population Genetics
- Molecular Genetics of *Bacillus subtilis*
- Evolutionary Genetics and Bioinformatics
- Human Molecular Genetics
- Psychiatric Genetics
- Plant Molecular Genetics
- Developmental Neurogenetics
- Molecular Cell Biology
- Molecular Evolution
- Neurogenetics
- Plant Developmental Genetics
- Genome Evolution and Bioinformatics

Research interests in Microbiology include the following areas:

- Prokaryotic Gene Regulation
- Cell Surfaces
- Molecular Genetics of Gram Positive Pathogens
- Bacterial Pathogenicity
- Microbial Pathogenesis
- Applied and Environmental Microbiology
- Malaria
- Eukaryotic Gene Regulation

2.4 Summary Statistical Profile of the School for the Academic Year 2008/09¹

Full-time Staff FTE	Undergraduate FTE	Postgraduate FTE	School Staff: Student Ratio	Faculty Staff: Student Ratio
23	224	60	13	14

Figures from Senior Lecturer's Annual Report approved by Council at its meeting on 16th December 2009

2.5 Accommodation and Facilities (Physical Resources)

The School is located in two separate buildings, the **Moyne Institute of Preventive Medicine** and the **Smurfit Institute of Genetics** which are located in the East end of the main TCD campus.

Teaching Space

The Smurfit Institute has no teaching spaces of its own. There is a small (10-12 seat) conference room, but otherwise the Genetics Department relies on University lecture theatres located in the same complex of buildings.

The Moyne Institute has a lecture theatre with a seating capacity of approximately 100. Its wooden pew-like furnishing dates from 1953. The Microbiology Department delivers all of its large-class Sophister teaching in this room. The theatre appears on the consolidated list of University teaching spaces and can be booked by other academic units. The Moyne Institute also has a seminar room that seats approximately 20. It is used by the Microbiology Department for its Sophister small-group teaching and tutorials and as a venue for research group meetings. The seminar room appears on the consolidated list of University teaching spaces and can be booked by other academic units.

¹ The staff FTEs include all Professors, Associate Professors, Senior Lecturers and Lecturers funded from the core HEA grant, or from self-financing courses, and all part-time and occasional staff and demonstrators, converted to an FTE, who are funded from core grant or from self-financing courses.

The Moyne Institute has a teaching laboratory for the delivery of practical instruction in microbiology. Classes from Science, Dentistry, Pharmacy and Medicine receive teaching here. It has a total capacity of approximately 50 but for safety reasons typically accommodates no more than 35. It is serviced by an adjacent preparation area manned by members of the technical staff. The Moyne Institute has a small teaching laboratory that currently houses the Molecular Visualization teaching facility. The room has a capacity of approximately 10 students.

The Moyne Institute has a library that is also used as a teaching space. It has a capacity of about twelve students. This room is also used as the boardroom of the School and for other business meetings. Otherwise it is used for private study by Senior Sophister students.

Research Space

Modern research laboratories are located on each floor of the Smurfit Institute. The Moyne Institute has research space of mixed quality. Space on the top floors of both the North and West wings has been fully refurbished in 2009 and is of excellent quality. Space of good quality is available in the 1994 extensions in the front basement areas of the North and West wings. Space in the remainder of the North wing is scheduled for renovation in 2010. This will include all of the ground floor and the rear basement.

Office Space

Academics in the Smurfit Institute have offices associated with their research laboratories. The Professor of Genetics has an office close to the departmental administrative office and conference room. Microbiology academics have offices in the Moyne Institute. Each Chief Technical Officer has a dedicated office. In Genetics, this is on the first floor of the Smurfit Institute and in Microbiology it is in the rear basement of the Moyne Institute. The Professor of Microbiology has an office next to the administrative office of the department.

Social Space

The Smurfit Institute has a large atrium with an area for social interaction, lunch, coffee etc furnished with tables and chairs at one end, close to a kitchen. The Moyne Institute has a large Foyer that is used for social occasions. It also has a staff room with kitchen facilities and tables and chairs for lunch, coffee etc.

3. Reviewer Recommendations

The Reviewers recommend that;

1. The School modifies its Mission Statement to include training and public engagement, and that this is confirmed at Faculty and College levels.
2. The College makes start-up funds available for staff taking up post since the moratorium was imposed.
3. The Faculty urgently releases a post to allow a senior Virologist to be appointed.
4. The School considers redressing the low number of women faculty when making future Staff appointments.
5. The School adds one or more small courses to the PhD programme to repair any deficiencies in student background.
6. A workload model is established and agreed in the School to ensure that the contributions of staff to the work of the School are appropriate.
7. Student feedback on courses is formalised and widely adopted across the School's teaching provision as soon as the College-wide web-based system is available.
8. Undergraduate students are given formative assessments to prepare them better for essay-based examinations.

9. The School explores possible taught Masters courses and discusses with the College the opportunity to use course income to hire new staff to deliver such courses.
10. The College reviews data on entry grades and degree classification to ensure consistency of high standards across the Faculty and College.
11. The College, Faculty and School work to establish efficient, effective and formal lines of communication, using arbitration between parties as necessary.
12. An Administrator is appointed to assist the Head of School in the day-to-day running of the School and to act as liaison with the College Administration.
13. The College considers financial models in which technical posts are underwritten against grant income and the School ensures that such posts are requested in applications for funding.
14. Further research space is allocated to the Genetics department contiguous with the existing research space in the Smurfit Institute.
15. The planned and funded refurbishment of the Moyne Institute Teaching and Research laboratories and preparation areas proceeds on schedule in Spring and Summer 2010.
16. The College recognises and rewards pre-existing high performance in future Resource Allocation to Schools.
17. The College considers retiring historic deficits to allow Schools to respond more easily to opportunities.
18. The College compares its model of allocating resource to central activities with those used by comparator institutions.
19. The School moves to unitary procedures in all functions which operate across both departments, adopting best practice from each.
20. The College adopts transparent and clearly-understood processes for decision-making, and communicates decisions quickly and formally.

4. Provost's recommendations to Council

In the light of the Review Report and the responses from the School of Genetics and Microbiology and the Faculty Dean, it is recommended that:

1. The School of Genetics and Microbiology working closely with the Dean of the Faculty of Engineering, Mathematics & Science, and other relevant Academic Officers, should consider the detailed recommendations of the Review Report and draw up an implementation plan² for Council approval.
2. The Senior Lecturer should review student data on entry grades and degree classification in respect of the courses offered by the School (recommendation # 10) and report to Council.

The reviewers make specific references to improving communications between the School, Faculty, and the Centre. It should be noted that the College Board has established a Review Taskforce to consider existing governance arrangements and it is expected that the matter of communications will be addressed by this group.

² See Procedures and Protocol for Quality Review of Schools 2008/09 at <http://www.tcd.ie/vp-cao/qu/qopdf/adrapp2.pdf>

5. Review Report

Review of the School of Genetics and Microbiology, Trinity College Dublin

March 2010

Introduction

The Review Team comprised

Professor Nigel Brown, Head of College of Science & Engineering, University of Edinburgh

Professor Sir David Hopwood, Emeritus Fellow, John Innes Centre, Norwich

Professor Virginia Zakian, Harry C. Wiess Professor in the Life Sciences, Department of Molecular Biology, Princeton University

Professor David Grayson, Head of School of Chemistry, Trinity College Dublin (Facilitator)

This report was prepared by the three external members of the Review Panel.

We thank the academic and administrative staff of the College for their work in preparing for this review, and for the extensive and informative documentation that was available to the Team. We particularly wish to thank Professor Grayson and Ms Helen Condon for their help during our visit to the College.

Prior to our visit to the College on 15-16 March 2010, the Review Team received the School self-assessment documents and a series of appendices including the School Strategic Plan, academic staff CVs, External Examiners' reports, data on student destinations, on undergraduate and postgraduate courses and on teaching duties, and the previous reviews of the Departments of Microbiology and Genetics. We each received a copy of the College Strategic Plan, undergraduate and postgraduate prospectuses, and a copy of 'A Framework for Quality in Irish Universities'.

During our visit we conducted interviews with the staff and a sample of students. The organisation of the two-day visit was excellent and the team valued the positive and active engagement of academic and technical staff, postdoctoral researchers, graduate students and undergraduates.

We were, however, very disappointed and surprised by the absence of the Faculty Dean for the duration of our visit. He is a key member of the College and makes decisions affecting the functioning of the School. We are grateful for the assurance of the Vice-Provost that our inability to obtain information to which only the Faculty Dean was privy will not affect the seriousness with which the College considers the outcome of the review. Key members of the University administration must be present for future School reviews if these reviews are to be maximally effective.

We are pleased to report that the grouping of the former Departments of Genetics and Microbiology into a single school is working well, with some new developments arising from the merger, and that the standards of research and teaching remain high. Staff from both Departments are enthusiastic about the merger and nearly everyone, from students to faculty to technical support, report a high degree of collegiality. There are, however, several issues that require the attention of the College and the School. Some of these are significantly exacerbated by the current economic climate and the resulting constraints imposed on the University sector and the funding agencies.

(i) Existing Provisions

(a) Research and Scholarly Activity

There is no doubt that the quality of research in the School is of a very high international standard and that this is recognised by the international communities in Genetics and Microbiology. The publications of several members of staff have been in the highest quality international journals. Many

of the staff score highly in terms of the number of citations their papers have received and all the Professors and Associate Professors exceed the accepted minimum standards of research citation in biological research at Professorial level (as measured by the Hirsch index), several by a considerable margin. This level of achievement is particularly noteworthy given the relatively small sizes of research groups in the School compared to what is found at many other top institutions.

Of the 23 staff, only three are female, and none of whom is a full Professor; one is an Associate Professor. The fraction of female students appears to be considerably higher. When the School has the opportunity to make staff appointments, there should be serious effort to increase the fraction of females, and the administration should support such endeavours.

By international standards, the School is small and cannot do everything. However staff are engaged on many of the major topics of importance in the Life Sciences and have previously been well funded to pursue their research, notably in recent years by Science Foundation Ireland. Only a relatively small amount of work of the School has direct application, but a considerable amount is strategic and will underpin future applications (in infectious and genetic diseases, and animal and plant breeding, for example). There is opportunity to collaborate across the School and with other Schools in the College in putting together larger research programmes which exploit the skills sets available across the College.

By and large the forward plans of individual members of staff are appropriate, based on previous research activities and taking into account the developments in the wider field. External factors, particularly research funding opportunities, will undoubtedly affect the opportunities to pursue these plans. While a number of staff pride themselves on pursuing high quality 'blue skies' research, we did detect a pragmatic approach to obtaining research funding, which may require strategic objectives to be prioritised.

Eight of the staff of the School work on microbial systems, one of whom is a member of the Department of Genetics. There is a strong emphasis on the genetics of bacterial systems, and a limited amount of collaboration between groups in this area. There are two members of staff working on yeasts, one of whom is newly-appointed, and one working on malaria. By international standards the groups are small and necessarily focused on very specific problems. In genetics, there are strengths in various aspects of neurogenetics, with two individuals working on retinopathies and three using *Drosophila* as a model of neurogenesis. The School also has strengths in evolutionary/computational genetics and plant genetics. All of these areas are high profile.

It is apparent that the two most recently-appointed members of staff are finding the establishment of their research activity at the College to be difficult due to the funding situation. The College decision not to provide start-up funds for staff was taken between Dr Fleming's acceptance of appointment and his arrival. The consequences of this decision disadvantage both the College and Dr Fleming and we strongly **recommend** that the assurance he was given about the availability of start-up funds be honoured. While we realize that the current financial constraints are severe, given the increased difficulty in securing external funding, it will be difficult for the School to make high quality appointments, especially of junior staff, without start-up packages. Even if quality appointments are made, individuals hired without start-up funds will be at a disadvantage in establishing competitive research groups.

Of some concern is the use of research grant funding to subsidise teaching. In financial good times this may not have been a serious issue, but it will increasingly become serious as current constraints on grants get worse.

A serious deficiency in the research profile of the School is the lack of Virology. A University which professes an international profile in Microbiology, and has research-led teaching, must have research in virology. Given the highly competitive nature of fundable virology research, this should be a senior appointment in the first instance and we **recommend** that this post be released at the earliest opportunity. In addition to filling an important teaching need, the potential emergence of viral pandemics, such as SARS and Swine Flu, as well as the ongoing HIV crisis, has made virology a high profile discipline. Again we appreciate that the current financial constraints are severe, but hiring a relatively senior Virologist in the School should be made a top priority for the College.

The published output of the School is strong and commensurate with high-performing Schools elsewhere. During the last 5 years, staff have published in the highest quality journals, including *Nature*, *Science*, *Cell*, *Molecular Cell*, *Proc Natl Acad Sci USA*, *EMBO J* and the leading discipline-specific publications, such as, *Molecular Microbiology*, *Genes & Development*, *J Bacteriol*, *J Biol Chem*, *Plant Cell*, *Plant J*, and the *Nature* discipline-specific journals. Many of these publications, including those of newly-appointed staff, are well cited, carrying forward the tradition that has led to some members of the School having exceptionally high citation ratings.

The current research activity should lead to an output of high quality publications over the next two years, and future research plans, if funded, will continue to provide publications that are likely to appear in the top journals. In addition, all staff publish to some extent, and there will be a corpus of solid research publications across the breadth of activity of the School. The few staff who have low publication rates in the standard biological literature are planning to continue and/or expand their outreach activities.

The School has been successful in raising funding from a variety of sources, particularly Science Foundation Ireland. This has taken precedence over the funding from the EU, in which the Departments have historically been successful. Given the current funding situation in Ireland, we recommend that the School focus its attention on those aspects of research that address the strategic requirements of SFI where possible, and re-engage with EU funding schemes as soon as possible. There is a perception that in recent years the College has not been as effective in influencing EU science programmes, and in helping faculty to win grants, as in earlier years, perhaps because of the relative generosity of funding from SFI. If so, this needs to be addressed to maximise the opportunities in all science schools to fund high quality research. Given the reputation of individuals within the School, we anticipate that they should be able to raise research funds and maintain activity through the economic downturn, but they should be given as much College support as possible to do so.

Research students are the academic lifeblood of the School. The academic staff is highly committed to teaching and, in Microbiology in particular, there are few postdoctoral researchers and research is largely undertaken by graduate students. The numbers of PhD students are appropriate to the number of active laboratories. It was noted that a large number of PhD students are doing their PhD research in the same laboratory in which they did their Senior Sophister research project. While we understand that this situation serves the staff well, students would receive a broader training if they were to change labs for their doctoral research. In addition, the School should continue efforts to identify graduate students who have done their undergraduate work at a different university, with the goal of diversifying the intellectual background of the students.

The PhD program is unstructured, with no formal class work. We appreciate that the PhD is short, currently with only three years of guaranteed support. Nonetheless, students come to graduate school with disparate backgrounds and a formal class work can fill in deficiencies and unify the class. We **recommend** that staff consider adding one or more courses to the graduate programme, at least for those students who have not already covered relevant material.

The students are mentored by their PhD supervisor and a thesis committee. In Microbiology, there is a robust formal process to convey information for the details of the graduate process, including progression from MSc to PhD registration, much of which is detailed in a booklet handed out to students at the start of their graduate training. We recommend that these procedures are also adopted by the Genetics staff as several Genetics students reported a lack of clarity as to the educational process. In both Genetics and Microbiology the students are appropriately supervised and supported, albeit that the mechanisms are sometimes informal.

PhD students in Microbiology are able to attend a reasonable number of conferences, largely because of their membership in the Society for General Microbiology, which provides grants for this purpose. It seems that the Genetics students have fewer possibilities for attending meetings. Efforts should be made to provide similar opportunities for Genetics students.

The majority of PhD students are funded for 3 years but take, typically 3.5-4 years to complete their degrees. The completion rates are appropriate and few students fail to be awarded a degree. In the UK, the Biotechnology and Biological Sciences Research Council funds students for 4 years and other Research Councils fund 3.5 years. We would like to see efforts made to fund students for at least 3.5 years.

Both Genetics and Microbiology are subjects in which research students are primarily engaged in their supervisor's laboratories or work closely with a supervisor in the field. The feedback is therefore mainly continuous and informal. There is no formal assessment of the research student experience.

The balance of published research, research supervision, and other research-related activities in the School appear to be appropriate.

Some senior staff have significant public profiles and sit on appropriate national and international committees. All staff appear to act as referees for learned journals and funding agencies commensurate with their seniority and specialities, and some sit on relevant scientific committees. We particularly recognise Professor David McConnell's high national profile and track record in promoting the public understanding of topical issues in genetics over many years, including on the occasion of the opening of the Smurfit Institute and the celebrations of Fifty Years of Genetics at Trinity. These efforts have done much to allay public concerns about genetic research and to generally benefit the image of the College.

(b) Teaching and Learning

With one exception, the range of the curriculum is appropriate across the disciplines taught in the School in the Moderatorships in Microbiology, Genetics and Human Genetics. The exception is the lack of staff with expertise in Virology. Although external teaching has been provided to some extent by a retired member of staff (who is himself not expert in this area), this is not appropriate to a research-led teaching environment and limits the research opportunities for the undergraduate students.

We are pleased to see new courses that give opportunity for appropriate specialisation in the second year. Now that the School has been formed for over two years, we hope to see more teaching between the disciplines in appropriate areas.

The figures for teaching loads of individual members of staff showed differences in load between the Genetics and Microbiology staff. In part this may be due to different staffing levels, but was also due to different ways of calculating the load of Senior Sophister research projects. We cannot therefore comment on apparent imbalances between the disciplines.

It was noticeable that some of the productive researchers have acquired high teaching loads. Newly-appointed staff are given relatively low teaching loads in the School, although these may be higher than in comparator institutions elsewhere. We **recommend** that an agreed workload model be implemented to ensure that all staff contribute appropriately to the functions of the School. Microbiology staff have a heavy teaching load, in part because of the large number of practicals given by the department. With the goal of freeing staff time to allow more focus on research, we suggest that staff conduct a careful review of these courses to determine if they can be reduced, or delivered in a less staff-intensive way, without seriously compromising the teaching mission.

There is no formalised process of obtaining and acting on feedback from undergraduate students. However, Sophister students consider the staff to be readily accessible. There is occasional and informal collection of feedback, particularly on new courses, for example. It would be appropriate to formalise this review and we **recommend** that the School obtains feedback on all courses through the web-based system shortly to be introduced by the College and establishes mechanisms for this to feed into course and curriculum review.

The mechanisms of assessment are largely appropriate to the curriculum, and include problem and essay questions as well as practical and research project assessment. However, the students noted that there was little feedback on essay writing in preparation for the essay-based examination questions in the 3rd and 4th years. We **recommend** that some formative assessments are undertaken to provide feedback to the students prior to the examinations, in accordance with good educational practice.

We note that there are no taught Masters programmes in the School. In this period of tight resources, introduction of such courses, which could bring in much needed revenue, should be reconsidered. There is a significant opportunity to establish novel and attractive courses for Masters students from

within and outside of the EU, which, providing the future resource allocation model for the College is appropriate, may fund additional staff to lead the course and expand the range of scientific expertise within the School, as happens elsewhere. We **recommend** that this be explored by the School and the College.

The completion rates for students over the years 2001/02 to 2004/05 has been between 72% and 80%. According to the Schools self-assessment, the majority of withdrawals are in the Freshman years and retention through the Sophister years is good. However, the Microbiology students have complained recently that there is a high failure rate in Year 3 and a low proportion of First Class degrees awarded. The School makes a point of maintaining standards at a high level, a position that we applaud. In the time available we did not have opportunity to compare entry scores and degree outcomes across a range of disciplines. We **recommend** that the College reviews these data in order to ensure that students are not unfairly advantaged or disadvantaged by their choice of Moderatorship.

Undergraduate students in genetics go on a field trip near the end of their third year. Students were very positive about this experience, especially the requirement to talk about their research project in a public setting. Microbiology does not have a field trip but does have a well regarded poster session. In the interests of increasing interaction between the two disciplines in the school, consideration might be given to having all students in both genetics and microbiology participate in the field trip and the poster session.

Seminars are critical for the intellectual life of the school. In the current year, there is no outside seminar programme for Genetics. We recommend that the two parts of the School jointly plan a yearly seminar programme that all students are expected to attend. The Genetics staff run a weekly in-house seminar programme where members of genetics research groups give research or journal club presentations. This programme is well regarded and microbiology post docs expressed a desire to be able to attend. We recommend that the seminar programmes be coordinated, for example by expanding the Genetics in-house seminar programme to include the Microbiology part of the School. The addition of these kinds of joint programmes will create an even greater sense of a joint Genetics-Microbiology community within the school.

As expected from the Mission of the School, a significant number of students go on to further study, and many of these remain in the College or go to other institutions in the Dublin area for research. There is a range of other jobs that students take up, many of which are laboratory- or discipline-based.

We have made no assessment of the external contributions to teaching and learning. We observe that the involvement of health professionals is entirely appropriate to the disciplines. However, the need to rely on members of the staff of the Tallaght Hospital for some Microbiology teaching does cause logistical problems in terms of travelling time for these staff.

(c) Service to College and Society

The service of established members of the staff to the College is as one would expect for a School of equivalent international standing. They have taken a variety of roles over the years according to their roles within the School, and senior members have served in a variety of roles in addition to those expected *ex officio*.

However, it was clear to the members of the Review Team that the engagement between the School and the College is now fractured and the lines of communication are weak. The School does not feel supported by the College and the College appears to consider the School troublesome. This is in stark contrast to other leading institutions of which we have experience, in which high-performing departments are supported and cherished, and that strategic decisions are communicated clearly by senior management. Frustration at the situation was expressed both by available senior College officials and by the School. We **recommend** that arbitration is undertaken to resolve these difficulties and that efficient, effective and formal lines of communication are opened. Due to their absence³, we

³ During the site visit the Reviewers requested a meeting with the Dean of Research but he was not available at short notice.

were unable to explore the roles and actions of the Faculty Dean and the Dean of Research in resolving these difficulties. The outreach and wider service activities of staff are impressive and appropriate. Members of staff do an excellent job and should continue to make their important contributions.

(d) Resources

The academic staff of the School are few in number but comparable with a number of leading institutions worldwide. At least one senior virologist, and preferably a second more junior virologist are needed to bring the School to competency in this key area of modern microbiological research and teaching. This is particularly the case because of the strong international reputation of the School in infection research.

The School needs an administrator to support the Head of School, to improve administrative interaction with the College and to make the Head of School position more attractive to potential successors. Without it, there is expected to be a real problem in arranging a satisfactory replacement for Professor Dorman when his term of office comes to an end. It is clear that staff spend too much time on administrative work and this amount is exacerbated by the fact that they do not have the appropriate expertise to get routine paperwork accomplished quickly. A School administrator may also improve interactions with the College administration by making it easier to convey specific information and we **recommend** that such a post be filled urgently.

There are considerably fewer technical staff than in many comparator departments, and these mainly support teaching and general service activities rather than research. We **recommend** that serious consideration be given to a staffing model in which technical posts in support of research are underwritten against recovery of salaries on grants. Such staff should have skills that allow them to be mobile in the School in response to grant income. The specialised equipment now required in biological research also requires specialist technical support. Especially through recent SFI funding, the School is well supplied with large, shared items of equipment but without dedicated technical support the potential benefits of this provision will not be reaped.

The physical infrastructure of the Smurfit Institute is excellent, but more contiguous space is required for research in genetics, allowing the bringing together and potential expansion of research groups. An example was provided by the problems faced by Professor Wolfe in carrying out lab-based, as distinct from computer-based, research. Members of staff were upset by the presence of the waste store on the top floor of the Smurfit Institute. If possible this facility should be relocated, even if it contains only small amounts of hazardous chemicals. We **recommend** that consideration be given to allocating further research space contiguous with the Smurfit Institute to the School.

The physical structure of the Moyne Institute is mixed, with some laboratories having been modernised, but others in urgent need of modernisation. The teaching laboratories and supporting technical rooms do not meet modern safety standards and we **recommend** that the planned funded refurbishment – funded by generous donations from the Normanby family - goes ahead on schedule in 2010 and that it be ready in time for the start of fall classes.

The research equipment is adequate and is shared across the College. Some of the teaching equipment, particularly computers, are out of date and need replacing. Some of the computer problems will be solved by the planned 2010 refurbishment; this upgrade is critical for the teaching mission of the School. The School should consider how it manages its IT facilities and whether retaining its own IT infrastructure is appropriate.

Offices, lecture and seminar rooms and social spaces appear adequate. Postgraduate students and research staff should have access to all the buildings of the School; currently postgraduate microbiologists do not have free access to the Smurfit institute. This omission is particularly a problem because it makes it difficult for microbiology students to attend the Friday in-house seminar programme that is held in Smurfit.

Financial resources are a serious issue for the School. The School has been operating with a deficit budget and appears to have been making inroads to address the deficit. However, we understand that the resource allocation model is being modified throughout the College. One model being considered rewards Schools for improving their performance in addressing the College Strategic Plan.

Such a model disadvantages a School which is already operating at a high international level in research, as the School of Microbiology and Genetics undoubtedly is, and we **recommend** that the College recognises pre-existing high performance and rewards it in the baseline funding of any new model.

The effect of a historic deficit in inhibiting new developments may well be to the long term disadvantage of the College, as it reduces the agility of the School to respond to opportunities in teaching and research. We **recommend** that the College gives consideration to retiring historic deficits. We understand that there is at least one precedent for this in the College.

Another change that would have considerable benefits would be the lifting of current restraints on the use of overhead funding on grants to allow it to be used more flexibly, for example on student projects, or travel, or chemicals. This may be outside College control, but could perhaps be taken up with policy makers in these times of economic constraints.

The Review Panel considered the distribution of financial resource to be weighted more towards the central administration than in other systems within which they have operated. We **recommend** that the College compare the distribution of resources with comparator institutions in Ireland and in Europe. The TRAC procedures and Full Economic Costing of research in the UK HE sector provide clarity on the costs of teaching, research and administration.

(e) Organisational Structures and Planning

The management structure within the School seems to be appropriate to its needs, with many roles being shadowed by a member of the other Department. This should ensure commonality of practice and enable succession planning. The lack of a School Administrator is a serious deficiency which puts additional work on the Head of School and reduces positive engagements with the College management. Many of the former separate practices of the two Departments still differ and we **recommend** that the School adopts single procedures for both departments, adopting current best practices from each.

The former informal management arrangements of the separate Departments have been formalised and the Committee structure appears to be appropriate to the needs of the School and the College.

Although operating with a historical deficit budget, the School has made appropriate provision for teaching, staffing and equipment. Planning and decision-making in relation to the budget is currently difficult because of uncertainties in national funding for salaries, teaching resource and research, and proposed changes to the College resource allocation model. The School is well-placed to win external funding for research providing the research infrastructure can be maintained.

Communication between the School and its staff and students is good. We came across only one example where communication with postgraduate students in one of the departments was less than satisfactory. Staff-student liaison seems to work well and students are represented on the School Committee.

Communication between the School and the Faculty is problematic. Staff feel that they are not informed of the basis for decisions taken at Faculty level. The situation is serious enough that there appears to be a widespread sentiment among staff in both disciplines that they are effectively disenfranchised and have little confidence in the process by which decisions are made. From the standpoint of staff, there needs to be much greater transparency in the decision making process. When decisions and actions are communicated, it is often done verbally. Our perception is one of hierarchical rather than collegial management processes. We **recommend** that the College adopts transparent processes for decision making and that decisions are communicated in writing as quickly as possible.

(f) Overall view and recommendations

The School is unusual in that the identities of the separate disciplines have been maintained. In most comparator institutions on the UK and Europe, Genetics and Microbiology departments have been subsumed into broader academic units, usually covering the range of non-medical life sciences.

However, we understand that there is considerable interaction across the Faculty in research and in teaching in the first two undergraduate years.

The mission of the School is focused very much on high academic research intensity and makes no statement about a mission in training or in public engagement. This is inadequate in the current socio-economic climate where the role of universities in training a skilled workforce is perceived as a major public justification for future funding.

The training of undergraduate and postgraduate students appears to be excellent and equivalent to that in leading departments elsewhere. The comments of the external examiners are very positive about the undergraduate experience, and the undergraduate and postgraduate students with whom we spoke were enthusiastic about their training.

In comparison with similar groupings elsewhere, the School has an extremely strong research profile and a good level of external grant funding. The recent increasing dependence on national funding is likely to be problematic in the future and a stronger focus on EU and Wellcome Trust funding will be necessary through the period of recession. The outputs of the School are remarkably strong with a high ratio of papers in the premier journals. There are only a few staff whose research activities are weak.

The School is small and therefore cannot teach all aspects of the subjects at Sophister level. However, the lack of a virologist is of extreme concern and would not be found in premier institutions elsewhere which, like the one at TCD, have a strong reputation in microbial pathogenesis. A senior and then a junior virology appointment are needed to bring the School to appropriate strength in this area. The other positions sought in Genetics are less critical and we have concerns that a single stem cell geneticist would find it difficult to compete internationally with the large groups being established elsewhere.

In making appointments, comparator institutions do not normally make these as fixed-term appointments, as these are unlikely to attract high-quality candidates. In North America the tenure system is used to terminate inappropriate appointments, and the probationary period is increasingly being used to similar effect in the European system. In addition, start-up packages are necessary to attract high-quality candidates and to enable them to get their research programmes moving as soon as possible after their arrival.

The staff of the School contribute to their disciplines at local, national and international levels. The senior members of the School, in particular, contribute in a major way to the international development of their disciplines.

The School has acted on all the recommendations of the last review of their individual departments. The formation of the School has been the major change since the last reviews. In our view the amalgamation of the separate departments into a single functioning School has not proceeded as rapidly as it might and we would like to see the School operate a single set of procedures across the disciplines. Of particular note was the difference in communication of procedures to the PhD students in Genetics and in Microbiology.

The amalgamation of the Departments into a single School has gone well in that the academic staff act in a collegiate manner. The different requirements across the School in terms of technical support for teaching and research are not appreciated by all the support staff and the development of a single body for technical support may be desirable.

The ambition of the School to maintain its high standards of research and research-led teaching are laudable and are supported by the Review Team. We were impressed by the collegiality between the two Departments and hope that the School will move quickly to common procedures across the Departments where appropriate, taking best practices from each. The breakdown in communications between the College, the Faculty and the School was very apparent during our visit and efforts to remedy this breakdown must urgently be addressed by all parties if the School and the College are to thrive.

We recommend that:

1. The School modifies its Mission Statement to include training and public engagement and that this is confirmed at Faculty and College levels.

2. The College makes start-up funds available for staff taking up post since the moratorium was imposed.
3. The Faculty urgently releases a post to allow a senior Virologist to be appointed.
4. The School considers redressing the low number of women faculty when making future Staff appointments.
5. The School adds one or more small courses to the PhD programme to repair any deficiencies in student background.
6. A workload model is established and agreed in the School to ensure that the contributions of staff to the work of the School are appropriate.
7. Student feedback on courses is formalized and widely adopted across the School's teaching provision as soon as the College-wide web-based system is available.
8. Undergraduate students are given formative assessments to prepare them better for essay-based examinations.
9. The School explores possible taught Masters courses and discusses with the College the opportunity to use course income to hire new staff to deliver such courses.
10. The College reviews data on entry grades and degree classification to ensure consistency of high standards across the Faculty and College.
11. The College, Faculty and School work to establish efficient, effective and formal lines of communication, using arbitration between parties as necessary.
12. An Administrator is appointed to assist the Head of School in the day-to-day running of the School and to act as liaison with the College Administration.
13. The College considers financial models in which technical posts are underwritten against grant income and the School ensures that such posts are requested in applications for funding.
14. Further research space is allocated to the Genetics department contiguous with the existing research space in the Smurfit Institute.
15. The planned and funded refurbishment of the Moyne Institute Teaching and Research laboratories and preparation areas proceeds on schedule in Spring and Summer 2010.
16. The College recognises and rewards pre-existing high performance in future Resource Allocation to Schools.
17. The College considers retiring historic deficits to allow Schools to respond more easily to opportunities.
18. The College compares its model of allocating resource to central activities with those used by comparator institutions.
19. The School moves to unitary procedures in all functions which operate across both departments, adopting best practice from each.
20. The College adopts transparent and clearly-understood processes for decision-making and communicates decisions quickly and formally.

Draft: 2 April 2010
Minor factual revision: 3 June 2010

6. Response from the School to the Review Report for Genetics & Microbiology

The School received the amended Review Document from the Quality Office on June 9th and it was discussed at a meeting of the School Executive the same day. In addition, members of the Executive submitted comments by e-mail in the days following the meeting. The Head of the School discussed the document and draft responses to the recommendations with the Faculty Dean on June 14th. Recommendations are listed below in bold type in the same numerical order as that used by the Reviewers. Each recommendation is followed by our response to it.

1. The School modifies its Mission Statement to include training and public engagement. The Mission Statement will be modified to address this. The form of the amendment will be decided at the next meeting of the School Executive.

2. The College makes start-up funds available for staff taking up post since the moratorium was imposed.

The Faculty Dean has agreed to transfer money to support a PhD studentship won by Dr Fleming, a new lecturer in the School. However, it will be important to offer any future appointees (such as the Virologist – see Recommendation 3) a realistic start-up package if we are to attract and retain the best candidates.

3. The Faculty urgently releases a post to allow a senior Virologist to be appointed.

The School has obtained assurances from the Faculty Dean that it is 'first in the queue' for such a post. It is critical that these assurances are translated into action and that an appointment is made at the earliest opportunity. The School has learned that yet further demands for 'savings' by the Government will delay the process until 2011. The Head of Microbiology has yet again had to use all of her considerable administrative skill to put in place make-shift arrangements to deliver at least some Virology teaching to Sophister students in the coming academic year. This is an unsatisfactory situation that is likely to result in yet further complaints from the student body.

4. The School considers redressing the low number of women faculty when making future Staff appointment.

The School certainly recognizes the imbalance between the sexes in its complement of academic staff – indeed it was the School that drew this to the Reviewers' attention. We take on board the recommendation but must point out that we are bound by employment legislation and College regulations in our hiring activities: all academic staff appointments are made through the College Staff Office and the School complies fully with College norms with regard to fairness and transparency in making appointments.

5. The School adds one or more small courses to the PhD programme to repair any deficiencies in student background.

The School Executive Committee is considering how best to do this through a process that is being led by the Director of Postgraduate Teaching and Learning.

6. A workload model is established and agreed in the School to ensure that the contributions of staff to the work of the School are appropriate.

The School Executive will investigate the reasons for the present imbalances and devise a mechanism to address them.

7. Student feedback on courses is formalized and widely adopted across the School's teaching provision as soon as the College-wide web-based system is available.

The School Directors of Teaching and Learning will lead the implementation of this recommendation. Of course, the provision of a College-wide web-based feedback system is beyond the control of the School.

8. Undergraduate students are given formative assessments to prepare them better for essay-based examinations.

This is already happening in some parts of the School and will now become the norm throughout the School. The School Executive will oversee its implementation.

9. The School explores possible taught masters courses and discusses with the College the opportunity to use course income to hire new staff to deliver such courses.

The School discusses this option regularly and will continue to keep it under review. However, we judge that such courses would bring more disadvantages (both academic and financial) than advantages to the School at present.

10. The College reviews data on entry grades and degree classification to ensure consistency of high standards across the Faculty and College.

This is a matter for the College, not the School. The School will cooperate fully with the College in its current and future investigations of these important matters.

11. The College, Faculty and School work to establish efficient, effective and formal lines of communication, using arbitration between parties as necessary.

The School Executive will seek a meeting with the Faculty Dean and Senior College Officers in the first instance to begin to address this issue.

12. An Administrator is appointed to assist the Head of the School in the day-to-day running of the School and to act as a liaison with the College Administration.

The School cannot pay for this from its own budget. It would wish to discuss with the College ways in which a suitable appointment could be made, possibly on a part-time basis. The School would prefer not to be compelled to make the appointment from the existing pool of College administrative staff but be free to consider other, more imaginative options, while complying with employment regulations.

13. The College considers financial models in which technical posts are underwritten against grant income and the School ensures that such posts are requested in applications for funding.

This seems a risky strategy to adopt in a period in which projected research income is forecast to decline rapidly. The recommended model has been used with success in some large UK schools where aggregate research income levels are relatively stable and predictable. It is not appropriate for a small school such as ours.

14. Further research space is allocated to the Genetics department contiguous with the existing research space in the Smurfit Institute.

This is not in the gift of the School; it is a matter for the Faculty and the College.

15. The planned and funded refurbishment of the Moyne Institute Teaching and Research laboratories and preparation areas proceeds on schedule in Spring and Summer 2010.

The latest information from the Director of Buildings Office (13th September 2010) is that floors and ceilings are in place and that painting of the space has been completed. It is hoped that furniture and fittings will be in place by the 27th September, the day on which undergraduate teaching is due to begin. If building work is not completed on schedule, the Microbiology department will not be able to deliver its full undergraduate teaching programme (including service teaching for other schools) in the Autumn 2010 Semester.

16. The College recognises and rewards pre-existing high performance in future Resource Allocation to Schools.

The College's draft Resource Planning Model (RPM) places this School at a severe disadvantage and is probably not fit for its intended purpose. We applaud this recommendation from the Reviewers that a model be devised that rewards high-performing Schools such as ours.

17. The College considers retiring historic deficits to allow Schools to respond more easily to opportunities.

This is essential if the School is to operate successfully in a highly competitive international arena. The proposed College RPM will severely impede our performance and render all 'strategic' planning by the School meaningless.

18. The College compares its model of allocating resources to central activities with those used by comparator institutions.

This is a matter for the College. We have been given verbal assurances that such comparisons have been made, but we have not seen the data.

19. The School moves to unitary procedures in all functions which operate across both departments, adopting best practice from each.

The School Executive is already doing this and will continue to do so as the School evolves.

20. The College adopts transparent and clearly-understood processes for decision-making and communicates decisions quickly and formally.

This is a recommendation for the College. The School would be delighted to contribute to any discussions of how best to implement it.

Charles Dorman
Head of School
22nd June 2010.

7. Dean's response to review report on School of Genetics and Microbiology

The Dean welcomes the Reviewers' recommendations and especially those related to two questions posed by him to the reviewers namely,

- 1) Should College support a self-confessed elitist School and if so how?, and
- 2) Does the School function as a School and what should be done to help the School function?

The reviewers provide an unequivocal recommendation that College should support such research-intensive Schools. However in this regard, the Dean draws the attention of Council and Board to the absolute incompatibility of this recommendation and both ARAM and now to a greater extent RPM, which has severe financial consequences for research-intensive Schools such as this one.

The reviewers suggest ways for the School to become more integrated and its processes more efficient with appropriate supports, and attention will be given to how this can be achieved. As shown in the School response some of the recommendations are already being worked on by Dean and Head of School.

In particular, in order to address the recommendations on communication issues, The Dean has proposed that additional communication meetings be set up between Dean and School members, in addition to 3 annual Faculty Forums, electronic Faculty Newsletters, Faculty Executive Minutes and Web-site, and numerous ad hoc meetings between Dean and individual School members.