University College Dublin

Periodic Quality Review

UCD School of Chemistry and Chemical Biology

April 2014

Accepted by the UCD Governing Authority at its meeting on 17 June 2014

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1. Introduction and Overview of UCD School of Chemistry and Chemical Biology

Introduction

1.1 This report presents the findings of a quality review of the School of Chemistry and Chemical Biology, University College Dublin, which was undertaken on 14-17 April 2014. The School response to the Review Group Report is attached as Appendix 2.

The Review Process

1.2 Irish Universities have collectively agreed a framework for their quality review and quality improvement systems, which is consistent with both the legislative requirements of the Universities Act 1997, and international good practice (e.g. Standards and Guidelines for Quality Assurance in the European Higher Education Area, 2007). Quality reviews are carried out in academic, administrative and support service units.

1.3 The purpose of periodic review is to assist the University to assure itself of the quality of each of its constituent units, and to utilise learning from this essentially developmental process in order to effect improvement, including:

- To monitor the quality of the student experience, and of teaching and learning opportunities
- To monitor research activity, including: management of research activity; assessing the research performance with regard to: research productivity, research income, and recruiting and supporting doctoral students.
- To provide an opportunity for units to test the effectiveness of their systems and procedures for monitoring and enhancing quality and standards
- To provide a framework within which the unit can continue to work in the future towards quality improvement
- To identify shortfalls in resources and provide an externally validated case for change and/or increased resources
- To identify, encourage and disseminate good practice
- To identify challenges and address these
- To provide public information on the University's capacity to assure the quality and standards of its awards. The University's implementation of its quality review procedures also enables it to demonstrate how it discharges its responsibilities for assuring the quality and standards of its awards, as required by the Universities Act 1997.

1.4 Typically, the review model comprises four major elements:

- Preparation of a self-assessment report (SAR)
- A visit by a review group (RG) that includes UCD staff and external experts, both national and international. The site visit normally will take place over a two or three day period
- Preparation of a review group report that is made public

- Agreement of an action plan for improvement (quality improvement plan) based on the RG report's recommendations. The University will also monitor progress against the improvement plan

Full details of the review process can be found on the UCD Quality Office website: www.ucd.ie/quality.

1.5 The composition of the Review Group for the UCD School of Chemistry and Chemical Biology was as follows:

- Professor Michael Gilchrist, UCD School of Mechanical and Materials Engineering (Chair)
- Professor David Croke, Royal College of Surgeons in Ireland (Deputy Chair)
- Professor Dominique Langevin, Université Paris-Sud, France (External)
- Professor Alison Rodger, University of Warwick, UK (External)

1.6 The Review Group visited the School from 14–17 April 2014 and held meetings with School staff, undergraduate and postgraduate students, the SAR Co-ordinating Committee, and other University staff, including the College Principal. The site visit schedule is included as Appendix 3.

1.7 In addition to the Self-assessment Report, the Review Group considered documentation provided by the School and the University during the site visit.

Preparation of the Self-assessment Report (SAR)

1.8 Following a briefing from the UCD Quality Officer, a Self-assessment Report Coordinating Committee (SARCC) was put in place. Committee membership and responsibility for Report chapters are set out below:

Member	**Position**	**Responsibility**
Dr Grace Morgan	Senior Lecturer	Chair of SARCC Chapters 6, 7, 8
Professor Pat Guiry	SCCB Head of School	Chapters 1, 9
Professor Martin Albrecht	SCCB Head of Research	Chapter 5
Professor Declan Gilheany	SCCB Head of Graduate Studies	Chapters 5 and 8
Professor Gareth Redmond	SCCB Physical Chemistry Section Head	

Professor Stefan Oscarson	SCCB Chemical Biology Subject Head	
Dr James Sullivan	Senior Lecturer, SCCB Director of Teaching and Learning	Chapter 4
Dr Mike Casey	Senior Lecturer	Chapters 2, 3, 4
Dr Andrew Phillips	College Lecture	Chapters 7, 8
Dr Eoghan McGarrigle	SFI funded Independent Research Fellow	Chapter 5
Mr Kevin Conboy	Chief Technical Officer	Chapter 3
Ms Mary Flannery	Senior Technical Officer	Chapters 7, 8
Ms Susan Muldoon	School Office Manager	Chapter 2
Dr Lorenzo Guazzelli	Postdoctoral Fellow	
Mr Anthony Fitzpatrick	Postgraduate Student	

1.9 The Committee met on 7 occasions between 2 July 2013 and 21 March 2014. In addition, the School held an open meeting for all staff on 25 September 2013; the review was a standing item at 7 monthly academic staff meetings held between September 2013 and March 2014; and sub-committees participated in other activities that supported the development of material for the SAR, including dedicated facilitated School T&L committee meetings.

The University

1.10 University College Dublin (UCD) is a large and diverse university whose origins date back to 1854. The University is situated on a large modern campus about 4 km to the south of the centre of Dublin.

1.11 The University Strategic Plan (to 2014) states that the University's mission is: "to advance knowledge, to pursue truth and to foster learning, in an atmosphere of discovery, creativity, innovation and excellence, drawing out the best in each student, and contributing to the social, cultural and economic life of Ireland in the wider world".

The University is organised into 38 schools in seven colleges:

- UCD College of Arts and Celtic Studies
- UCD College of Human Sciences
- UCD College of Science
- UCD College of Engineering and Architecture
- UCD College of Health Sciences
- UCD College of Business and Law
- UCD College of Agriculture, Food Science and Veterinary Medicine

1.12 As one of the largest universities on the island of Ireland, UCD supports a broad, deep and rich academic community in Science, Business, Engineering, Health Sciences, Agriculture, Veterinary, Arts, Law, Celtic Studies and Human Sciences. There are currently more than 24,000 students in our UCD campus (approximately 15,500 undergraduates, 8,000 postgraduates and 2,000 Occasional and Adult Education students) registered on over 70 University degree programmes, including over 6,100 international students from more than 121 countries. The University also has over 5,400 students studying UCD degree courses on campuses overseas.

UCD School of UCD School of Chemistry (SCCB)

1.13 The School of Chemistry and Chemical Biology (SCCB) is one of seven Schools in the UCD College of Science. It comprises 20 full-time academic staff, 3 administrative staff, 14 Technical / Specialist staff (13 FTEs) and 2 adjunct lecturers.

1.14 The SCCB is a significant contributor to the suite of Science undergraduate degrees offered at UCD, which includes a three-year Bachelor of General Science (BSc General Science) and a four-year Honours Degree (BSc (Hons)). The School currently offers five Honours Degree BSc programmes:– the traditional BSc in Chemistry*; a BSc in Medicinal Chemistry & Chemical Biology* (commenced 2006); a BSc in Chemistry with Sustainable and Environmental Chemistry (commenced 2012); a BSc in Chemistry with Biophysical Chemistry (commenced 2012); and a BSc in Chemistry & Maths Education (commenced 2013) (* accredited by the Royal Society of Chemistry). In addition, the School provides service teaching to students proceeding to degrees in Engineering, Medicine, and Agricultural Science. Furthermore, the School contributes the taught components of a Taught Masters Degree in Chemistry by Negotiated Learning (MSc) (commenced 2012), a Research Masters Degree (MSc) and a Structured Doctorate in Chemistry (PhD). The SCCB initiated the first Structured PhD programme in Ireland in 2006 through the formation of a joint graduate programme, Dublin Chemistry, with Trinity College Dublin.

1.15 SCCB is a research intensive School with 88 PhDs and 27 postdoctoral fellows housed in state-of-the-art research facilities. SCCB research is interdisciplinary and includes the following major domains: catalysis and new synthetic transformations; bio/nano interface; advanced spectroscopy; new materials for magnetic, medicinal and electronic applications; carbohydrate chemistry and research on education in chemistry.

General comments:

1.16 The School has a long and distinguished history of international excellence in teaching and in research that has served UCD and Ireland well. Many academic staff are world class and others have demonstrable talents to also be world class. This is a legacy of previous successful recruitment, mentoring and promotion activities within the School and UCD. The recent infrastructural developments on the UCD campus of the Science Centre have, in part, been possible because of the leadership of staff and the excellence of this important core discipline within UCD. Despite the significant disruption to continuing School activities during

this capital development programme, the School has successfully managed to enhance the quality and scale of its taught programmes by virtue of the dedication and efforts of the academic, technical and administrative staff within the School. The new facilities for teaching and research within the School are truly world class, and are comparable to those in most of the leading research intensive universities around the world. The staff associated with the School have worked closely with the design team to ensure that this new facility will serve the needs of the School for the coming decades.

Commendations:

1.17 The School offers a good range of degree programmes, responsive to the needs of industry and society. The School enjoys good relations with other Schools within UCD through provision of service teaching (Engineering, Medicine, Science) and engagement in College and University committees. The Review Group welcomes the award of RSC accreditation to the BSc (Chemistry) & BSc (Medicinal Chemistry and Chemical Biology) degree programmes. The Review Group welcomed the alignment of School activities with UCD strategy in revenue generation through recruitment of economic fee-paying non-EU students to a taught MSc programme, albeit in relatively small numbers.

1.18 The Review Group was impressed by the high regard in which the School is held by the Pharmaceutical sector – it clearly is the 'go to' institution when hiring PhD chemists in Ireland. The state of the art teaching and research facilities that now exist in UCD will serve the School well in its ambition to be regarded as Ireland's Chemistry Training Centre.

2. Organisation and Management

2.1 The Review Group was impressed by the engagement and commitment of the Head of School of SCCB. Despite being Head of School for almost three years, he remains one of their most research active staff, carries a full teaching load including a core 1st Year module in addition to his other modules, and is deeply engaged with a number of the University's most important committees including Governing Authority and the University Committee for Academic Appointments, Tenure and Promotions (UCAATP). Despite this onerous commitment, he is regarded by students as one of the most inspiring and approachable staff within SCCB. The Head of School has played a pivotal role in bringing the School to its current position where it is poised to achieve new levels of international prominence.

2.2 The School is now at a critical juncture in its future development: a world class infrastructure has been developed for UCD Science and SCCB in recent years and the number of academic and technical staff has dropped significantly. It is not apparent to the Review Group that merely increasing the academic staff numbers to their historic levels will provide a staff profile that will properly equip the School for the next phase of its development. While the School has expressed its desire to recruit three academic positions in the near future in areas of (i) biocatalysis, (ii) flow chemistry, and (iii) nanotoxicology, it is more urgent that the School addresses the issue of uneven workloads of academic staff in order to capitalise on the benefits of having groups of staff that share a common vision for SCCB. Considering the evidence presented to the Review Group, it is clear that the distribution of work-loads among the academic staff of SCCB is quite arbitrary and is not being managed optimally – it is essential that SCCB implement a Workload Model and use it to allow the allocation of duties to be made on a transparent and equitable basis.

2.3 A number of members of academic staff allegedly are quite resistant to contributing their full share (however that is defined, see 2.2) to the 'core business' of SCCB, namely undergraduate & postgraduate teaching, despite the best efforts of the Head of School (& his predecessors). This is unacceptable. The Review Group takes the view that the Head of School should be empowered to deal with this situation.

2.4 The management structure within SCCB has a School Management Team, chaired by the Head of School and comprising of the chairs of eight sub-committees, namely (i) Section Groups, (ii) Teaching & Learning, (iii) Graduate Studies, (iv) Research & Innovation, (v) Outreach, Student Recruitment and Alumni, (vi) Undergraduate Staff and Student Committee, (vii) Seminars, and (viii) Safety. The School Management Team meets monthly, three days ahead of the monthly Academic Staff Meeting. In turn, this is followed a day later by the School Executive Committee. Among some non-academic staff there is a perception that this governance structure does not give adequate 'voice' to technical and administrative staff. It is important that technical and administrative staff understand clearly how their direct involvement in school management is realised.

2.5 Among the sub-committees within SCCB, the Research Committee does not appear to be fit for purpose and has not had a significant impact thus far, despite the best efforts of its Chair, who also serves as Chairman of the Research & Innovation Board for the College of Science

and is a member of the College Executive Committee. The School should reconsider the Terms of Reference of this Committee with a view to developing proactive strategies for re-invigorating the research activities of staff who have been experiencing difficulty in obtaining research funding through external competition.

2.6 The UCD 'Resource Allocation Model (RAM)' clearly disadvantages laboratory-intensive Schools such as SCCB. While it is welcome that the University has become more pragmatic in its interpretation of the RAM in recent years, it is clear that the recurrent School deficit and the Employment Control Framework have prevented the replacement of staff members. The University should consider moving to a cost allocation model that is less punitive for schools with extensive teaching & research laboratory space.

Commendations:

2.7 An engaged, committed Head of School.

Recommendations:

2.8 As a matter of utmost urgency, the SCCB should implement a Workload Model to allow the allocation of duties among the members of academic staff to be made on a transparent and equitable basis. See also §3.14a.

2.9 The Head of School should be empowered to deal with the issue of staff who are reluctant to teach. The Head of School should be supported, as appropriate, by advice and assistance from UCD Human Resources, key members of the University Management Team in addition to the College Principal, and other units within the University where specialist organisational management expertise may reside (e.g., UCD School of Business). See also §3.14b, §3.14f and §3.14g.

2.10 The governance structure of SCCB should be redesigned to include effective representation from the Technical and Administrative staff. The Review Group recommends that the SCCB considers merging its Management Team and its Executive Committee. All academic, administrative and technical staff should be properly represented in governance of the School. See also §3.15d.

2.11 The School should reconsider the Terms of Reference of the Research Committee with a view to developing strategies for re-invigorating the research activities of staff who have been experiencing difficulty in obtaining external research funding. See also §5.10.

2.12 The SCCB should formulate a strategic plan with 5-year and 20-year horizons. They should also work closely with the College of Science to identify specific actions that need to be achieved within the coming 5-year period.

2.13 Having considered the Resource Allocation Model, the Review Group recommends that the University should consider moving to a cost allocation model that is less punitive for schools with extensive teaching & research laboratory space.

2.14 There are a number of issues that need to be addressed at College and University levels in order for SCCB to engage more fully and widely with overall University objectives:

- The message that academic collaboration is not an impediment to promotion at UCD needs to be communicated effectively to staff.

- All members of SCCB need to develop an understanding of where decisions are made that affect the School's operation within UCD.

- The School needs to develop a portfolio of interactions with University senior management.

3. Staff and Facilities

3.1 All staff within the School are passionate and enthusiastic about chemistry, irrespective of whether they are associated with any of the three Sections of Physical Chemistry, Organic Chemistry or Inorganic Chemistry. Teaching to Stage 1 and Stage 2 undergraduates within UCD's new undergraduate science programmes is delivered by senior and experienced academic staff who are uniformly regarded as inspirational by students. This is a justifiable source of pride for the School and for the College of Science.

3.2 The SCCB enjoys a very high standard of accommodation, laboratory facilities and instrumentation – arguably state-of-the-art.

3.3 The School's eight Professors have earned national and international recognition for their research contributions, as evidenced by their well cited publications. Six of them are very active, and extremely successful in grant applications. Three professors currently win large amounts of competitive funding and have very large groups, with many PhD students and post-docs. Another professor has just obtained a prestigious European Research Council (ERC) grant. On the other side, two professors have a reduced scientific activity due to lack of funding. A smaller proportion of non-professorial members of the School's academic staff are also active, while the others (about half) have currently no or little grant income. Some still have PhD students, funded by the School (Research Demonstrators). Because this type of funding does not include consumables, funding is still an issue.

3.4 One staff member is funded by SFI on a temporary contract (4 years). Another one funded earlier on a similar basis since 2009 obtained a permanent position afterwards. The School is making increased use of SFI funded positions, which is a risky option since obligations to provide a permanent position to the hired person (Stokes positions) no longer exist. Increasing use of post-doctoral and PhD students to compensate for the lack of permanent staff is also made, not only for laboratory work, but also for lectures.

3.5 Reduction in staff complement has been paralleled by an increase in student numbers. There is, therefore, an increased workload for the academic staff, accompanied by cuts in salaries and promotions. A supplementary increase in workload also came from an increase in the number of courses being offered. As a result, some staff members are becoming demoralised and demotivated, while other members deem themselves too active in research to be able to increase their teaching load. Overall, teaching duties are unevenly distributed and some staff members are facing enormous teaching loads. Some have ceased their research activities but not increased their teaching activity to balance this. Such a situation is highly undesirable.

3.6 During the past five years, several academic staff members have departed with a net reduction in the number of academic staff in SCCB. Because of this reduction, the current student:staff ratio is the highest (520 student FTEs for 20 academic FTEs) of all laboratory based schools within the College of Science. The student:staff ratios in these laboratory based schools range from 14:1 to 26:1. A ratio of 20:1 is regarded as high internationally. The aspiration of the School is to return to a complement of 25 academics to regain critical

mass through strategic appointments in key research areas, specifically biocatalysis, flow chemistry & nano-toxicology. Hiring new academic staff would seem sensible in order to take full advantage of these premium facilities. Having discussed the School's aspirations in this regard at length, however, the Review Group was not convinced that the immediate solution lies in recruiting five additional staff until other issues have been resolved with the current staff complement.

3.7 Technical staff are an indispensible part of a chemistry school, both for assistance during undergraduate teaching and also in research. SCCB technical staff provide high-quality support, which is greatly appreciated both by the students and by the researchers. The School has experienced a reduction in staff complement in recent years through staff departures, retirement, etc. The situation regarding technical staff is critical in that, considering the impending retirement of yet another long-serving technician together with losses to-date, it will be impossible for SCCB to run the required schedule of undergraduate laboratory practicals during the coming 2014–2015 academic year while adhering to statutory health & safety standards. The University must, as a matter of urgency, sanction the recruitment of at least two technicial staff immediately in order to cope with the teaching demands of the next academic year.

3.8 The School administrative staff complement of three is felt to be adequate to support the current level of School activity but there is little, if any, spare capacity for the School to increase its activity level. There is inadequate capacity to provide emergency cover or to cope with workloads at the busiest times during the academic session. For the laboratory based Schools in the College of Science, the ratio of student FTE : administrator FTE ranges from 140:1 to 190:1. Within SCCB, it is approximately 170:1.

3.9 Storage space for laboratory supplies and for administrative files (specifically past examination papers) is inadequate.

Commendations:

3.10 The Review Group commends the University on its foresight and investment in the Sciences generally and in Chemistry in particular through the provision of such excellent accommodation, facilities and equipment for the SCCB.

3.11 The facilities for Chemistry are the best in Ireland and excellent compared to other schools in the world.

3.12 The School's academic staff have contributed to establish the excellent reputation of the school both among the students for whom Chemistry has become a favourite topic (even more popular than Biology) and in the research area, where they are extremely successful in particular with grant applications and high level publications. Their reputation in industry is excellent and all the PhD students seem to find either academic or industrial positions.

3.13 The cohesion, sense of purpose, work ethic and mutual support present in all of the School's staff, technical and administrative, is noteworthy. The administrative staff seems to have

stream-lined activity that covers a wide range of administrative work very efficiently. As long as no-one is off for an extended period of time they can manage with the current staff. They are to be commended. The academic staff work on a more individual basis, which is an inherited model.

Recommendations:

3.14 Academic Staff

a. Staff workloads are not equitable, whether one accepts the premise that research activity should reduce one's teaching and administration load or not. The supervision of undergraduate project students places different demands on staff, depending on the size of their respective groups of postdocs and PhD students. The Review Group strongly recommends the first stage of a workload model be established immediately within the School: namely a transparent list of teaching, administration, PhD supervision and other indicators of research activity. The School should use this model in the short- to medium-term (i) to divide responsibilities among staff members equitably and (ii) to implement measures to re-invigorate the research careers of staff who currently lack significant research funding. Decisions need to be taken as to what extent research income reduces teaching and administration loads. See also §2.8.

b. The University and College are strongly encouraged to help the School develop a transparent process to deal with poor performance.

c. Consideration should be given to how new academic members of staff are supported, mentored and integrated into the School and what training should be given to them.

d. Members of the School are encouraged to look strategically for opportunities for collaboration with SCCB colleagues as well as within the wider University and externally.

e. The Head of School and College Principal should consider whether the SFI funded Independent Research Fellow should be offered a permanent academic position.

f. The SFI Stokes Professor should be integrated more fully into the School. This is important for the future success of the School and will allow both the School and the SFI Stokes Professor to maximise their mutual opportunities and potential, particularly in the area of Physical Chemistry. If necessary, this relationship should be managed with appropriate support from outwith the School and College. See also §2.9.

g. Senior professorial staff who have extremely light teaching loads have an important ambassadorial role to play in inspiring 1st year and 2nd year undergraduate students to study chemistry. This is particularly so in respect of Physical Chemistry. While the demands of leading a major research group are not always compatible with delivering a large teaching load throughout an academic year, it is imperative that staff in these senior positions recognise this responsibility and engage appropriately in undergraduate

teaching. This leadership role is critical to the long-term future of chemistry in UCD. See also §2.9.

3.15 Technical Staff

a. The Review Group recommends that the College of Science recognise the acute shortage of Laboratory Technicians in SCCB and allocate the funding necessary to allow the School to recruit two technician FTEs (as permanent staff) immediately to guarantee safe and sustainable delivery of laboratory-based teaching to undergraduate students (1 for Stage 1 practicals; 1 for Stage 2+3 practicals and Synthetic Chemistry). These resources will be required to be in place in time for the academic session 2014/15. See also §4.9.

b. The Review Group recommends that the College of Science facilitate the employment of a third technical staff member in the medium-term to provide essential additional technical cover for undergraduate practical classes and to support Physical Chemistry.

c. There is a need for urgent replacement of one technical staff member to help with NMR and Mass Spectroscopy equipment. The School should consider whether research income and external contract income would be sufficient to fund this position.

d. Technical staff feel alienated from the academic management of the School. The School should include their input and strategic thinking in the decision-making process. See also §2.10.

3.16 Postdoctoral researcher career development in SCCB depends largely on the serendipity of the postdoc asking for and the supervisor offering opportunities. The career development of this group of staff should be formalised. Opportunities for them to meet together as a cohort should also be created in the School as they can be isolated in their groups. This could be part of the revised Research Committee remit.

3.17 Facilities

a. More space is needed for the chemical stores.

b. More suitable space is required for ongoing archives of examination scripts prior to their being destroyed.

4. Teaching, Learning & Assessment, and Curriculum Development & Review

4.1 SCCB delivers a range of teaching. Overall the Review Group was impressed with the quality of the teaching provided both to core chemistry degrees and to support chemical training in other degree streams. Members of staff with whom the Review Group discussed teaching matters were an impressive group who are clearly committed to teaching high quality chemistry to students about whom they care greatly. The teaching programme has recently (May 2013) been assessed for accreditation by the Royal Society of Chemistry (RSC). As a result of that, both the BSc (Hons) Chemistry and the BSc (Hons) Medicinal Chemistry and Chemical Biology received RSC accreditation. The Review Group particularly commends the School's policy of having first class teachers giving first year courses. The School's attention to reviewing courses in general seems to be successful.

4.2 Chemistry teaching at undergraduate level is dependent on well-managed and equipped facilities for laboratory practical classes. While SCCB currently has excellent laboratories and a good inventory of equipment, the School must begin to plan for the rolling renewal / replacement of ageing equipment items in the longer-term.

4.3 The Review Group enjoyed a dynamic conversation with groups of undergraduate and postgraduate students who were in general extremely positive. The students made some helpful comments which the group recommends be considered. Those which are not included under the recommendations below are summarised in Appendix 1.

Commendations:

4.4 The Review Group commends the School on the high-quality 'first year experience' that it delivers to science students. SCCB has been very successful in persuading the brightest and best of UCD Science students to pursue degree programmes in Chemistry by ensuring a high-quality 'first year experience' through the deployment of its most talented teachers to deliver Stage 1 modules.

4.5 The School is commended for a high quality teaching programme that produces graduates valued by employers and enjoyed by the students. The RSC accreditation also recognises this.

4.6 The School is commended for having a good range of degree programmes that are responsive to the needs of industry and society, and that are highly regarded by the Pharmaceutical sector within Ireland.

4.7 RSC accreditation is a very useful external international validation of the undergraduate programme(s) and the School is to be commended for achieving this accolade after a gap of several years following modularisation.

Major recommendations

The major recommendations of the Review Group are given below. Further recommendations and commendations specific to undergraduate and postgraduate teaching are given in Appendix 1.

4.8 *Strategy Away Day*

The Review Group suggest the School have an away day to develop a clear strategy for teaching to guide future course revisions and also to ensure lecturers are more aware of what course material students have studied in previous modules.

4.9 *Technical Staff Provision*

The Review Group was convinced of the need for additional technical staff provision, particularly in light of further retirements in the near future. This issue was independently raised by academic staff, PhD demonstrators, undergraduate students and support staff. Apart from the role technical staff play in providing an effective laboratory training environment, there is the issue of needing to ensure safety in the laboratory. See also §3.15a and §A1.17.

4.10 *Financial Consequences of Student Recruitment*

The School should consider the finance modelling of different teaching options that have been recommended across the University and College to earn non-exchequer income.

4.11 *Teaching Equipment*

The School must begin to plan for the rolling renewal / replacement of ageing equipment items in its teaching laboratories in the longer-term.

4.12 *New Course*

The School should consider whether developing a BSc or MSc course in formulation and pharmaceutical manufacturing (including equipment used, powder flow, statistics, process control), perhaps linked with chemical engineering, is desirable. At least new modules in these areas would be valued by future employers, possibly as short courses.

5. Research Activity

5.1 The information supplied in the SAR report was insufficient to evaluate the research activity of the School. Further information was provided during the visit and discussions with the PIs together with the laboratory visit allowing a better insight into the research activities. The School appears to be one of the most research active schools in UCD. The School activities can be grouped in three topics:

- Inorganic Chemistry: Catalysis, synthesis and material science
- Organic Chemistry: Carbohydrates
- Physical Chemistry: Nanochemistry, nanoparticle toxicity

Although the traditional division of Chemistry topics is still used officially, the PIs recognise that new promising research topics are at the interfaces between these topics. Several of them have identified interesting routes for the future, one of them being at the interface with biomedicine. Deeper synergies are being pursued and are to be encouraged. The Review Group could not identify a research strategic plan for the School, which should be established as a matter of urgency.

5.2 Research output has been substantial and includes publications in very high impact journals. Moreover the School has been successful in launching several successful commercial spinoffs. One staff member has recently been awarded an ERC grant. The Review Group believes, however, that the percentage of research active academics can increase, particularly when it is recognised that almost 50% (9 of 20) of the academic staff generate less than 1% of the research income to the School.

5.3 Apart from four PIs who were recently successful in generating significant SFI funding for collaborative activities, the other PIs work independently. In light of the critical financial situation of the School, more collaborative initiatives between SCCB staff members with complementary research interests and expertise are necessary to enable staff to respond to the new ways that research funding is awarded. The research activities of successful PIs are remarkable and should serve to inspire other staff to find ways to cluster or collaborate with colleagues and start new activities with suitable and sustainable funding conditions. Successful staff should play a role in mentoring other staff.

5.4 In common with many academic schools in Irish higher education, the SCCB currently has a number of academic staff who effectively are research inactive as the result of lack of success in securing continued research funding. The School needs to take measures to re-invigorate the research careers of such staff members through (i) facilitating their alignment with funded P.I.s within the School or the wider University, (ii) facilitating co-P.I. funding applications with peers, (iii) offering periods of sabbatical leave to allow staff to develop new ideas, (iv) making limited ‘seed-funding’ available to such staff, etc. The SCCB Research Committee should take a proactive role in such initiatives.

5.5 The Research Committee is comprised of 5 research active PIs although only two to three of them meet regularly. This structure needs to be reconstituted. Indeed, it is necessary to identify suitable areas for collaboration that are likely to develop in the future and in which there are possibilities to obtain substantial funding, either from SFI or from EU.

Commendations

5.6 Among the research active academic staff members, the scale and quality of the School's research activity are excellent by any standard and are world class. Apart from some rare exceptions, this has been achieved without productive interactions among researchers within SCCB.

5.7 The staff has been enriched by a limited number of good recent academic recruitments with good potential.

5.8 The School now has a large cohort of PhD students who seem to be highly motivated, well-managed and capable of delivering significant research.

Recommendations

5.9 A strategic plan for research should be developed and cover at least the coming 5 years.

5.10 A number of people have slipped into being research inactive, but this is not a reflection of their intrinsic ability. The School needs to address this issue and take measures, perhaps under the aegis of the Research Committee, to 'kick-start' the research careers of currently research inactive staff members (See also §2.11). The Review Group recommends such staff work in partnership with other colleagues — it will be better for the School if this is within the School. Research active staff should play a role in mentoring and engaging colleagues that are inactive in research. Sabbatical visits to world-class laboratories could be a catalyst. The Review Group recommends that SCCB (with support from the College of Science) implement a programme of measures to re-invigorate the research of staff who currently lack substantial research funding. This should be coordinated to maximise the opportunity for staff who participate in this programme, and to maximise the value to the School and University. Among the measures that should be considered are:

- Pairing the staff member up with another SCCB colleague (the 'Main P.I.') who is well funded on the basis of a 'Co-P.I.' arrangement, taking into account existing complementarity of interests/expertise;

- Identifying two world-class laboratories run by collaborators of the Main P.I. where the Co-P.I. can visit for a period of sabbatical leave (perhaps one semester plus the summer months) funded by UCD [a number of conditions would be imposed by the University such as regular monitoring & concrete outcomes];

- While on sabbatical, the Co-P.I. will develop and progress a line of research complementary to that of the Main-P.I.;

- On their return to SCCB, the Co-P.I. will continue to work with the Main-P.I. to localise their new research line to SCCB and to make joint applications for funding.

5.11 As a priority matter for the School and the College of Science, a modest source of consumable money should identified and made available to ensure staff remain research active through a bumpy funding period. The School and College should consider more strategic use of Research Demonstratorships, and provide a small consumable budget to accompany them. The allocation/award process needs to be transparent and made available to such staff subject to appropriate criteria (e.g., targeting new funding sources, initiating a new collaboration with a UCD colleague, etc.). The funding for such support might usefully come from a proportion of research overhead monies retained at the College level, or from some modest industry donation, or from the resources of a well funded PI with whom a collaboration could prove to be beneficial. Such internal supports should not displace the need to pump-prime the research of newly appointed academic staff.

5.12 Research technical support for NMR and Mass Spectrometry (MS) has got much worse, to the detriment of the quality of research. The School should consider whether a business base in terms of research funding and external contract work could be made to at least partially support an additional NMR/MS technician to use the state-of-the-art equipment more effectively.

6. Management of Quality and Enhancement

Student quality

6.1 It is notable that UCD in general, and SCCB in particular, have put measures in place which, in recent years, have brought about a significant increase in the standard of students entering the University's science degree programmes and, by extension, in the standard of students entering degree programmes in SCCB. The minimum Leaving Certificate points requirement for entry to Science at UCD is now in excess of 500 points, which puts UCD on a par with its major competitor, Trinity College Dublin. This has been achieved by a programme of outreach activities to secondary schools in Ireland and abroad. It was clear to the Review Group that SCCB staff are active participants in this programme, demonstrating commendable foresight and collegiality. Furthermore, through the excellence of the 'first year experience' delivered to Science students in Chemistry, a significant percentage of previously undecided students now opt for a Chemistry major in their Bachelors degree. This is achieved by SCCB through deploying passionate and charismatic lecturers to deliver first-year modules in Chemistry, an initiative that was praised highly by the student representatives whom the Review Group met.

Feedback on curriculum, teaching & learning

6.2 The School avails of a range of opportunities to gather feedback from students on its taught programmes; these include University-wide on-line module surveys and paper-based intra-School surveys of 3rd and 4th year students. It is significant that SCCB was a participant in a University-sponsored initiative to explore more efficient mechanisms for 'closing the feedback loop' with students. The undergraduate students who met the Review Group acknowledged that they are informed of actions taken by the School in response to their feedback. The Review Group was impressed by the School's activity in this regard and would encourage them to continue to seek creative ways to close the feedback loop.

Royal Society of Chemistry accreditation of degree programmes

6.3 The Review Group welcomed the fact that SCCB has received accreditation of its BSc (Hons) degree programmes in Chemistry and in Medicinal Chemistry & Chemical Biology. This accreditation is important external validation of the quality of the taught programmes offered by SCCB.

Interactions with External Examiners

6.4 The role of External Examiners as guarantors of quality standards is recognised by SCCB staff; they play a significant role in monitoring assessment in particular and they have an opportunity to meet with students during their site-visits. The reports prepared by the External Examiners are an important source of feedback and advice which the SCCB does consider. However, it is unfortunate that a formal system for considering External Examiner recommendations and documenting the School's responses to them has not been implemented. Such a system would provide a useful 'audit trail' to document the School's

response to this input. It surprised the Review Group that UCD did not have such processes in place.

Commendations:

6.5 The Review Group commends the participation of SCCB staff in University outreach activities to secondary schools.

6.6 The Review Group commends the high quality of the 'first-year experience' delivered by SCCB to Science students.

6.7 The Review Group commends the School's engagement with student feedback processes and with their External Examiners.

6.8 The Review Group commends the School on achieving RSC accreditation for two its degree programmes.

Recommendations:

6.9 The School must continue to explore concrete ways to 'close the feedback loop' with students once they have received feedback (whether through the centralised module surveys or through the paper-based surveys that are run within the School).

6.10 SCCB should implement a formal system for considering External Examiner recommendations and documenting the School's responses to them. Ideally this would be driven from University level.

7. Support Services

7.1 The SCCB as a large, internationally-recognised School within UCD interacts with the full range of administrative and support functions within the University, including Human Resources, International Office, UCD Research, Buildings Office, Health & Safety, NovaUCD, Bursar's Office, Teaching & Learning and Outreach & Development Office (College of Science). It is commendable that the School, for the most part, enjoys cordial and productive relationships with these functions.

7.2 In its meeting with representatives of the support functions, the Review Group observed that communications between SCCB and individual support services may be hampered by a lack of awareness (on one or both sides) of relevant contact information and/or of what services are available. The Review Group noted the success of the model adopted by UCD Human Resources in which individual staff members were identified as liaison staff for individual Colleges within the University to provide a readily identifiable conduit for engagement with the Colleges and their component Schools.

Commendations:

7.3 The Review Group commends SCCB and most of the university support service units on their good working relationships.

Recommendations:

7.4 The Review Group recommends that SCCB would engage in a process of dialogue with the UCD International Office to identify and agree mechanisms by which they can work together to promote the international marketing of SCCB degree programmes.

7.5 The Review Group recommends that UCD support services should consider designating individual staff members as liaison staff for individual Colleges within the University in an appropriate way that is similar to the UCD HR Partners. In support units where this may not be most effective, a minimum and less expensive alternative would be for those units to have clearly identified roles for their staff and for those roles to be properly communicated to schools. This might simply require having an up-to-date website with the names, photographs, email addresses, and telephone details. In some instances it would be helpful for those support units to visit schools and communicate their support responsibilities directly to all academic staff. An identified School link person may be useful in some cases.

8. External Relations

8.1 It was evident to the Review Group that SCCB enjoys good working relationships with the College Principal, the other Schools within the College of Science and more broadly within the University.

8.2 The Review Group was impressed by the high regard in which the School is held within the Irish Pharmaceutical industry.

8.3 SCCB is an active participant in the outreach activities managed by the College of Science, and clearly has benefited from this through the substantial increase in the standard of students entering UCD undergraduate science degree programmes over recent years.

8.4 Through its excellent undergraduate and graduate programmes, SCCB has generated a significant pool of graduates within the worldwide community of UCD alumni. The Review Group would encourage the School to engage more intensively with its alumni as a potential resource for leveraging university-industry collaboration, accessing philanthropic support, etc.

Commendations:

8.5 The Review Group commends SCCB on its good working relationships with other Schools and Colleges within UCD.

8.6 The Review Group commends SCCB on its active participation in College of Science & University outreach activities.

8.7 The Review Group commends SCCB on the high regard in which the School is held within the Irish Pharmaceutical industry.

Recommendations:

8.8 The Review Group recommends that SCCB identify ways in which to engage more actively with its alumni, both in Ireland and abroad.

9. Summary of Commendations and Recommendations

A. General

Commendations:

A.1 The School offers a good range of degree programmes, responsive to the needs of industry and society. The School enjoys good relations with other Schools within UCD through provision of service teaching (Engineering, Medicine, Science) and engagement in College and University committees. The Review Group welcomes the award of RSC accreditation to the BSc (Chemistry) & BSc (Medicinal Chemistry and Chemical Biology) degree programmes. The Review Group welcomed the alignment of School activities with UCD strategy in revenue generation through recruitment of economic fee-paying non-EU students to a taught MSc programme, albeit in relatively small numbers.

A.2 The Review Group was impressed by the high regard in which the School is held by the Pharmaceutical sector – it clearly is the 'go to' institution when hiring PhD chemists in Ireland. The state of the art teaching and research facilities that now exist in UCD will serve the School well in its ambition to be regarded as Ireland's Chemistry Training Centre.

B. Organisation and Management

Commendations:

B.1 An engaged, committed Head of School.

Recommendations:

B.2 As a matter of utmost urgency, the SCCB should implement a Workload Model to allow the allocation of duties among the members of academic staff to be made on a transparent and equitable basis. See also §C.5a.

B.3 The Head of School should be empowered to deal with the issue of staff who are reluctant to teach. The Head of School should be supported, as appropriate, by advice and assistance from UCD Human Resources, key members of the University Management Team in addition to the College Principal, and other units within the University where specialist organisational management expertise may reside (e.g., UCD School of Business). See also §C.5b, §C.5f and §C.5g.

B.4 The governance structure of SCCB should be redesigned to include effective representation from the Technical and Administrative staff. The Review Group recommends that the SCCB considers merging its Management Team and its Executive Committee. All academic, administrative and technical staff should be properly represented in governance of the School. See also §C.6d.

B.5 The School should reconsider the Terms of Reference of the Research Committee with a view to developing strategies for re-invigorating the research activities of staff who have been experiencing difficulty in obtaining external research funding. See also §E.5.

B.6 The SCCB should formulate a strategic plan with 5-year and 20-year horizons. They should also work closely with the College of Science to identify specific actions that need to be achieved within the coming 5-year period.

B.7 Having considered the Resource Allocation Model, the Review Group recommends that the University should consider moving to a cost allocation model that is less punitive for schools with extensive teaching & research laboratory space.

B.8 There are a number of issues that need to be addressed at College and University levels in order for SCCB to engage more fully and widely with overall University objectives:

- The message that academic collaboration is not an impediment to promotion at UCD needs to be communicated effectively to staff.
- All members of SCCB need to develop an understanding of where decisions are made that affect the School's operation within UCD.
- The School needs to develop a portfolio of interactions with University senior management.

C. Staff and Facilities

Commendations:

C.1 The Review Group commends the University on its foresight and investment in the Sciences generally and in Chemistry in particular through the provision of such excellent accommodation, facilities and equipment for the SCCB.

C.2 The facilities for Chemistry are the best in Ireland and excellent compared to other schools in the world.

C.3 The School's academic staff have contributed to establish the excellent reputation of the school both among the students for whom Chemistry has become a favourite topic (even more popular than Biology) and in the research area, where they are extremely successful in particular with grant applications and high level publications. Their reputation in industry is excellent and all the PhD students seem to find either academic or industrial positions.

C.4 The cohesion, sense of purpose, work ethic and mutual support present in all of the School's staff, technical and administrative, is noteworthy. The administrative staff seems to have stream-lined activity that covers a wide range of administrative work very efficiently. As long as no-one is off for an extended period of time they can manage with the current staff. They

are to be commended. The academic staff work on a more individual basis, which is an inherited model.

Recommendations:

C.5 Academic Staff

a. Staff workloads are not equitable, whether one accepts the premise that research activity should reduce one's teaching and administration load or not. The supervision of undergraduate project students places different demands on staff, depending on the size of their respective groups of postdocs and PhD students. The Review Group strongly recommends the first stage of a workload model be established immediately within the School: namely a transparent list of teaching, administration, PhD supervision and other indicators of research activity. The School should use this model in the short- to medium-term (i) to divide responsibilities among staff members equitably and (ii) to implement measures to re-invigorate the research careers of staff who currently lack significant research funding. Decisions need to be taken as to what extent research income reduces teaching and administration loads. See also §B.2.

b. The University and College are strongly encouraged to help the School develop a transparent process to deal with poor performance.

c. Consideration should be given to how new academic members of staff are supported, mentored and integrated into the School and what training should be given to them.

d. Members of the School are encouraged to look strategically for opportunities for collaboration with SCCB colleagues as well as within the wider University and externally.

e. The Head of School and College Principal should consider whether the SFI funded Independent Research Fellow should be offered a permanent academic position.

f. The SFI Stokes Professor should be integrated more fully into the School. This is important for the future success of the School and will allow both the School and the SFI Stokes Professor to maximise their mutual opportunities and potential, particularly in the area of Physical Chemistry. If necessary, this relationship should be managed with appropriate support from outwith the School and College. See also §B.3.

g. Senior professorial staff who have extremely light teaching loads have an important ambassadorial role to play in inspiring 1st year and 2nd year undergraduate students to study chemistry. This is particularly so in respect of Physical Chemistry. While the demands of leading a major research group are not always compatible with delivering a large teaching load throughout an academic year, it is imperative that staff in these senior positions recognise this responsibility and engage appropriately in undergraduate teaching. This leadership role is critical to the long-term future of chemistry in UCD. See also §B.3.

C.6 Technical Staff

a. The Review Group recommends that the College of Science recognise the acute shortage of Laboratory Technicians in SCCB and allocate the funding necessary to allow the School to recruit two technician FTEs (as permanent staff) immediately to guarantee safe and sustainable delivery of laboratory-based teaching to undergraduate students (1 for Stage 1 practicals; 1 for Stage 2+3 practicals and Synthetic Chemistry). These resources will be required to be in place in time for the academic session 2014/15. See also §D.6.

b. The Review Group recommends that the College of Science facilitate the employment of a third technical staff member in the medium-term to provide essential additional technical cover for undergraduate practical classes and to support Physical Chemistry.

c. There is a need for urgent replacement of one technical staff member to help with NMR and Mass Spectroscopy equipment. The School should consider whether research income and external contract income would be sufficient to fund this position.

d. Technical staff feel alienated from the academic management of the School. The School should include their input and strategic thinking in the decision-making process. See also §B.4.

C.7 Postdoctoral researcher career development in SCCB depends largely on the serendipity of the postdoc asking for and the supervisor offering opportunities. The career development of this group of staff should be formalised. Opportunities for them to meet together as a cohort should also be created in the School as they can be isolated in their groups. This could be part of the revised Research Committee remit.

C.8 Facilities

a. More space is needed for the chemical stores.

b. More suitable space is required for ongoing archives of examination scripts prior to their being destroyed.

D. Teaching, Learning & Assessment, and Curriculum Development & Review

Commendations:

D.1 The Review Group commends the School on the high-quality 'first year experience' that it delivers to science students. SCCB has been very successful in persuading the brightest and best of UCD Science students to pursue degree programmes in Chemistry by ensuring a high-quality 'first year experience' through the deployment of its most talented teachers to deliver Stage 1 modules.

D.2 The School is commended for a high quality teaching programme that produces graduates valued by employers and enjoyed by the students. The RSC accreditation also recognises this.

D.3 The School is commended for having a good range of degree programmes that are responsive to the needs of industry and society, and that are highly regarded by the Pharmaceutical sector within Ireland.

D.4 RSC accreditation is a very useful external international validation of the undergraduate programme(s) and the School is to be commended for achieving this accolade after a gap of several years following modularisation.

Major recommendations

As stated in 4.3 above, a number of commendations and recommendations arising from the Review Group's engagements with students, along with findings from other discussions during the site visit, are set out in Appendix 1. These recommendations are in addition to the major recommendations included in Section 4 above and listed below.

D.5 *Strategy Away Day*
The Review Group suggest the School have an away day to develop a clear strategy for teaching to guide future course revisions and also to ensure lecturers are more aware of what course material students have studied in previous modules.

D.6 *Technical Staff Provision*
The Review Group was convinced of the need for additional technical staff provision, particularly in light of further retirements in the near future. This issue was independently raised by academic staff, PhD demonstrators, undergraduate students and support staff. Apart from the role technical staff play in providing an effective laboratory training environment, there is the issue of needing to ensure safety in the laboratory. See also §C.6a and §A1.17.

D.7 *Financial Consequences of Student Recruitment*
The School should consider the finance modelling of different teaching options that have been recommended across the University and College to earn non-exchequer income.

D.8 *Teaching Equipment*
The School must begin to plan for the rolling renewal / replacement of ageing equipment items in its teaching laboratories in the longer-term.

D.9 *New Course*

The School should consider whether developing a BSc or MSc course in formulation and pharmaceutical manufacturing (including equipment used, powder flow, statistics, process control), perhaps linked with chemical engineering, is desirable. At least new modules in these areas would be valued by future employers, possibly as short courses.

E. Research Activity

Commendations

E.1 Among the research active academic staff members, the scale and quality of the School's research activity are excellent by any standard and are world class. Apart from some rare exceptions, this has been achieved without productive interactions among researchers within SCCB.

E.2 The staff has been enriched by a limited number of good recent academic recruitments with good potential.

E.3 The School now has a large cohort of PhD students who seem to be highly motivated, well-managed and capable of delivering significant research.

Recommendations

E.4 A strategic plan for research should be developed and cover at least the coming 5 years.

E.5 A number of people have slipped into being research inactive, but this is not a reflection of their intrinsic ability. The School needs to address this issue and take measures, perhaps under the aegis of the Research Committee, to 'kick-start' the research careers of currently research inactive staff members (See also §B.5). The Review Group recommends such staff work in partnership with other colleagues — it will be better for the School if this is within the School. Research active staff should play a role in mentoring and engaging colleagues that are inactive in research. Sabbatical visits to world-class laboratories could be a catalyst. The Review Group recommends that SCCB (with support from the College of Science) implement a programme of measures to re-invigorate the research of staff who currently lack substantial research funding. This should be coordinated to maximise the opportunity for staff who participate in this programme, and to maximise the value to the School and University. Among the measures that should be considered are:

- Pairing the staff member up with another SCCB colleague (the 'Main P.I.') who is well funded on the basis of a 'Co-P.I.' arrangement, taking into account existing complementarity of interests/expertise;

- Identifying two world-class laboratories run by collaborators of the Main P.I. where the Co-P.I. can visit for a period of sabbatical leave (perhaps one semester plus the summer months) funded by UCD [a number of conditions would be imposed by the University such as regular monitoring & concrete outcomes];

- While on sabbatical, the Co-P.I. will develop and progress a line of research complementary to that of the Main-P.I.;

- On their return to SCCB, the Co-P.I. will continue to work with the Main-P.I. to localise their new research line to SCCB and to make joint applications for funding.

E.6 As a priority matter for the School and the College of Science, a modest source of consumable money should identified and made available to ensure staff remain research active through a bumpy funding period. The School and College should consider more strategic use of Research Demonstratorships, and provide a small consumable budget to accompany them. The allocation/award process needs to be transparent and made available to such staff subject to appropriate criteria (e.g., targeting new funding sources, initiating a new collaboration with a UCD colleague, etc.). The funding for such support might usefully come from a proportion of research overhead monies retained at the College level, or from some modest industry donation, or from the resources of a well funded PI with whom a collaboration could prove to be beneficial. Such internal supports should not displace the need to pump-prime the research of newly appointed academic staff.

E.7 Research technical support for NMR and Mass Spectrometry (MS) has got much worse, to the detriment of the quality of research. The School should consider whether a business base in terms of research funding and external contract work could be made to at least partially support an additional NMR/MS technician to use the state-of-the-art equipment more effectively.

F. Management of Quality and Enhancement

Commendations:

F.1 The Review Group commends the participation of SCCB staff in University outreach activities to secondary schools.

F.2 The Review Group commends the high quality of the 'first-year experience' delivered by SCCB to Science students.

F.3 The Review Group commends the School's engagement with student feedback processes and with their External Examiners.

F.4 The Review Group commends the School on achieving RSC accreditation for two its degree programmes.

Recommendations:

F.5 The School must continue to explore concrete ways to 'close the feedback loop' with students once they have received feedback (whether through the centralised module surveys or through the paper-based surveys that are run within the School).

F.6 SCCB should implement a formal system for considering External Examiner recommendations and documenting the School's responses to them. Ideally this would be driven from University level.

G. Support Services

Commendations:

G.1 The Review Group commends SCCB and most of the university support service units on their good working relationships.

Recommendations:

G.2 The Review Group recommends that SCCB would engage in a process of dialogue with the UCD International Office to identify and agree mechanisms by which they can work together to promote the international marketing of SCCB degree programmes.

G.3 The Review Group recommends that UCD support services should consider designating individual staff members as liaison staff for individual Colleges within the University in an appropriate way that is similar to the UCD HR Partners. In support units where this may not be most effective, a minimum and less expensive alternative would be for those units to have clearly identified roles for their staff and for those roles to be properly communicated to schools. This might simply require having an up-to-date website with the names, photographs, email addresses, and telephone details. In some instances it would be helpful for those support units to visit schools and communicate their support responsibilities directly to all academic staff. An identified School link person may be useful in some cases.

H. External Relations

Commendations:

H.1 The Review Group commends SCCB on its good working relationships with other Schools and Colleges within UCD.

H.2 The Review Group commends SCCB on its active participation in College of Science & University outreach activities.

H.3 The Review Group commends SCCB on the high regard in which the School is held within the Irish Pharmaceutical industry.

Recommendations:

H.4 The Review Group recommends that SCCB identify ways in which to engage more actively with its alumni, both in Ireland and abroad.

APPENDIX 1

Additional Comments, Commendations and Recommendations on Teaching, Learning & Assessment and Curriculum Development & Review

As stated in 4.3 in the main text of the Review Group Report, the Review Group held a series of constructive meetings with groups of undergraduate and postgraduate students. A number of commendations and recommendations arising from those engagements, along with findings from other discussions during the site visit, are set out below. These recommendations are in addition to the major recommendations included in Section 4.

Commendations

Undergraduate students

A1.1 The students really appreciated the quality of first year chemistry teaching.

A1.2 Overall the students valued the variety of teaching styles and the efforts staff made to be dynamic in their delivery.

A1.3 Plans to link with UCD alumni to develop internship opportunities are to be lauded.

Graduate students

A1.3 PhD students presented a very positive view of their training, research training and activity in chemistry. The School is encouraged to continue their efforts in this area.

A1.4 The one MSc student the Review Group met seemed happy with their programme and its diversity.

Recommendations

Undergraduate students

A1.5 Students indicated that the quality of delivery for some modules was unsatisfactory, specifically thermodynamics and kinetics. The Review Group recommends that the School review this provision and, when changes are made, to communicate them to the students.

A1.6 The students reported that effectively there are prerequisites for third year courses of which they had not been aware, e.*g.* if students have chosen a chemistry/biology route then they do not have enough maths and physics for third year physical chemistry. This should be an agenda item for the Away Day recommended in §4.8 above.

A1.7 The students stated that they would find it helpful to have the option of more chemistry modules available in Stages 1 and 2 and/or perhaps flexibility to take modules in more than one year. This should be an agenda item for the Away Day recommended in §4.8 above.

A1.8 The School should consider mid-semester feedback.

A1.9 Mathematical competence of students is in general not sufficient for the more advanced physical chemistry courses. It is recommended the School explore ways of dealing with this issue.

A1.10 Introductory physical chemistry not coming until Stage 2 reinforces the bias of the School in favour of synthesis. The School should consider whether this is advisable both on pedagogic grounds and due to the fact that the more mathematically competent students may avoid chemistry as a result.

A1.11 Physical chemistry teaching equipment is very old and will not match the new laboratory facilities. The School should consider how to address this issue in the coming years.

A1.12 Students were very negative about certain non-chemistry courses *e.g.* microbiology and biochemistry. The School is advised to look very carefully at the non-chemistry modules the students take to determine whether they are fit for purpose.

Postgraduates and postdoctoral researchers

A1.13 Academic staff should ensure they make time to get papers written involving their postdoctoral researchers and PhD students.

A1.14 The School has a range of sophisticated equipment used by PhD and postdoctoral researchers which is not supported by technical staff. This is inefficient and can result in expensive repairs being required. The School should consider how to support such equipment.

A1.15 Some PhD student teaching loads seem very high (9 contact hours per week). There does not seem to be a policy or uniformity in this. The School should consider ways to address this issue and it should be an agenda item for the Away Day recommended in §4.8 above.

A1.16 The marking load for staff and PhD students is very high. The School should consider how this might be streamlined without prejudicing the student experience.

A1.17 PhD students should not be required to do technician work for the teaching programme (see major recommendation §4.9).

A1.18 The School should consider changing the title of the MSc as 'negotiated learning' is a misleading label. The Review Group recommends that the School consider formally developing MSc degree streams to address this.

APPENDIX 2

UCD School of Chemistry and Chemical Biology Response to the Review Group Report

The UCD School of Chemistry and Chemical Biology found the Quality Review exercise to be useful and thought-provoking. There was a high level of engagement from all staff categories and from the student community, both in compiling the Self-Assessment Report and in interacting with the Review Group during the site visit. The School wishes to thank the Review Group for their time, expertise and constructive comments, both at the visit and in their excellent Report, which commends extensively the high quality of teaching and research in the School, delivered by a dedicated and committed team of academics, support staff, postdoctoral fellows and graduate students.

Both the Review Group Report and the Self-assessment Report were useful in highlighting current areas of excellence and opportunities for further development/improvement. We were pleased that the Report recognised the acute shortage in technical staff and the efforts made during an extremely challenging environment, both internal and external, by the School to maintain the quality of its programmes. We agree that the School is at an important juncture in its future development, with a World-class teaching and research infrastructure and will require continued support from the University and beyond to maximise the opportunities at hand and realise our potential. We have played, and continue to play, the leading role in providing the expert graduates to fuel the pharmaceutical/chemical and related industries whose success is critical for the Irish economy.

The School is formulating a plan to act on the Review Group recommendations as set out in their Report, starting with a Strategic Planning Day in June 2014. The School will work both internally and with the College/University Management to address the recommendations, where possible over the next 12 months.

The School's Self-assessment Report, the Review Group Report and the Quality Improvement Plan will all be used to inform the School's academic and resource planning activities for the next strategic period.

APPENDIX 3

Review Visit Timetable

UCD School of Chemistry and Chemical Biology
14-17 April 2014

Pre-Visit Briefing Prior to Site Visit **Monday, 14th April 2014**	
17.00-18.45	RG meet in hotel to review preliminary issues and to confirm work schedule and assignment of tasks for the following two days– **RG and UCD Quality Office only**
19.30	Dinner hosted for the RG by the College Principal, UCD College of Science - **RG, College Principal and UCD Quality Office only**

Day 1: Tuesday 15th April 2014 **Venue: CSCB Meeting Room, Centre for Synthesis and Chemical Biology**	
09.00-09.30	**Private meeting** of Review Group (RG)
09.30 – 10.15	RG meet with **Head of School**
10.15-10.30	Break
10.30 –10.50	RG meet with **College Principal,** UCD College of Science and Dean of Science
10.50-11.15	RG meet with senior members of School staff
11.15 – 11.30	Tea/coffee break
11.30 – 12.15	RG meet with **SAR Coordinating Committee**
12.15-12.45	Break – RG review key observations and prepare for lunch time meeting
12.45-13.45	Working lunch (buffet) **– meeting with external stakeholders**
13.45-14.15	RG review key observations

14.15-15.30	RG meet with **representative group of academic staff** – primary focus on Teaching and Learning, and Curriculum issues
15.30-15.45	RG tea/coffee break
15.45-16.30	RG meet with **administrative/technical support staff** representatives
16.30-16.35	Break
16.40-17.30	RG meet **Head of School** and **College Finance Director** to outline School's financial situation
17.30-18.30	**Tour of facilities** with Head of School and Chair of SAR Committee
18.30	RG depart

Day 2: Wednesday 16 April 2014
Venue: CSCB Meeting Room, Centre for Synthesis & Chemical Biology

08.45-09.15	Private meeting of the RG
09.15-09.55	RG meet **representatives of relevant UCD support units**
09.55-10.10	Break
10.10-11.00	RG meet with a representative group of **postgraduate students** (taught and research) and **recent graduates** (PG and UG)
11.00-11.15	RG tea/coffee break
11.15-12.15	RG meet with **representative group of academic staff** – primary focus Research issues
12.15-12.30	Break - RG review key observations
12.30-13.15	Lunch – Review Group only
13.15-14.00	RG meet with representative group of **undergraduate students**
14.00-14.15	RG private meeting - review key observations
14.15-15.00	RG meet with **Dean of Programme**; **Chair of BSc Programme Board**; and **Deputy Director, College of Science Programme Office**
15.00-15.15	Break

15.15-16.00	RG meet with **recently appointed members of staff**
16.00-16.30	RG meet with **Postdoctoral Research Staff**
16.40-16.55	**Private individual meetings** with staff
17.00-17.30	RG meet representative from **UCD Bursar's Office**
17.30	RG depart
18.00 – 21.30	RG reconvene at hotel to review key observations/findings and begin preparing draft RG Report

Day 3: Thursday, 17 April 2014
Venue: CSCB Meeting Room, Centre for Synthesis & Chemical Biology

09.00-09.30	Private meeting of RG
09.30-10.00	**Private individual meetings** with staff
10.00-10.45	RG continue preparing draft RG Report
10.45-11.00	Break
11.00-11.30	Additional meetings with individual academic staff
11.30-12.30	RG continue preparing draft RG Report
12.30-12.45	RG meet with **College Principal** to feedback initial outline commendations and recommendations
12.45-13.15	Lunch
13.15-13.45	RG finalise first draft of RG Report and feedback commendations/recommendations
13.45-14.00	Break
14.00-14.20	RG meet with **Head of School** to feedback initial outline commendations and recommendations
14.30	**Exit presentation** to all available staff of the unit summarising the principal commendations/recommendations of the Review Group
15.00	Review Group depart