

TRINITY COLLEGE DUBLIN



PROVOST'S REPORT TO COUNCIL ON THE REVIEW OF THE SCHOOL OF PHARMACY & PHARMACEUTICAL SCIENCES

1. INTRODUCTION

This report presents the outcome of a review of the School of Pharmacy & Pharmaceutical Sciences. An external peer review visitation was undertaken on the 15th & 16th April 2009 by Professor Gerrit Borchard, University of Geneva, Professor Martin Feelisch, University of Warwick and Professor Arnold G. Herman, University of Antwerp. The internal facilitator was Professor Veronica Campbell, School of Medicine, Trinity College Dublin.

The report is based on (i) feedback from the external Reviewers received on the 21st May 2009, (ii) a submission from the School of Pharmacy & Pharmaceutical Sciences received on the 3rd June 2009 and (iii) a submission from the Dean of Health Sciences received on the 29th May 2009.

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

Trinity College School of Pharmacy & Pharmaceutical Sciences aims to develop existing accredited educational student-centred programmes which will equip graduates with the knowledge-base necessary for the delivery of quality medicines, pharmaceutical agents and therapeutic devices befitting 21st century health care. It strives to produce pharmacy graduates and specialist graduates who will enhance health care through their patient-oriented understanding of aspects of disease, health strategies, medicines and pharmacoconomics of existing and new therapies. It aims to deliver pharmacy and science postgraduates with the qualified specialist skills required by Ireland's pharmaceutical/chemical and biotechnological industries and to encourage research by engaging high quality pharmaceutical scientists capable of devising new drug entities, syntheses, analytical protocols and delivery systems.

2.2 Programmes to which the School provides teaching

Undergraduate:

- Bachelor in Science (Pharmacy)

Postgraduate:

- M.Sc./Diploma in Pharmaceutical Manufacturing Technology
- M.Sc./Diploma in Pharmaceutical Analysis

- M.Sc. in Hospital Pharmacy
- M.Sc./Diploma in Community Pharmacy
- M.Sc./Diploma in Pharmaceutical Technology

2.3 Research

The School's research activities are broadly described as consisting of three main research areas. These are: 1. Drug design, discovery and analysis (Chemistry), 2. Drug development (Pharmacology) and 3. Drug delivery (Pharmaceutics). Eleven Research Groups have been formally established with the idea to foster interdisciplinary and collaboration both within the former Pharmacy Departments and with likeminded Schools/Departments within College. These Research Groups are: Advanced Drug Delivery, Clinical Pharmacokinetics, Natural Products, Drug Design and Discovery, Neuropharmacology, Platelets, Inflammatory Bowel Diseases, Drug Transport and Targeting, Pharmacy Practice, Allergy, and Nanosciences.

2.4 Summary Statistical Profile of the School for the Academic Year 2007/08¹

Full-time Staff FTE	Undergraduate FTE	Postgraduate FTE	School Staff: Student Ratio	Faculty Staff: Student Ratio
18.53	211	117	18	15

Figures from Senior Lecturer's Annual Report approved by Council at its meeting on 14th January 2009

2.5 Accommodation and Facilities (Physical Resources)

The total space occupied by the School is 2,950 square metres which is assigned as follows:

Laboratory – Undergraduate	825.12m ²
Laboratory – Graduate	1,212.65m ²
Classroom Facilities	167.53m ²
Academic Office & Related Space	633.26m ²
Library & Study Facilities	70.46m ²
Student Activity Space	41.46m ²

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.

3. EXTERNAL PEER REVIEW REPORT

SUMMARY OF REPORT

The Reviewers report that *“considering the financial and environmental limitations the School of Pharmacy and Pharmaceutical Sciences is operating under, the staff is doing an outstanding job.”* They feel, however, that the *“School of Pharmacy & Pharmaceutical Sciences at Trinity College will face a number of new challenges related to an ever increasing level of competition for the best students, teachers and researchers at a national and international level.”* The Reviewers were positively impressed by the quality of the staff and the pragmatic measures taken to make the best of their situation, and report that important first steps have been taken by the Head of School to improve both research output and quality without compromising teaching quality.

3.1 RESEARCH

The Reviewers report that the school continues to find itself in a transition phase, with senior staff having retired and not been replaced over the last couple of years. They note that emphasis has been put on teaching, leaving little time to develop research, and they feel that this has resulted in a *“comparably low research output in terms of publications and a comparably low visibility and standing of junior faculty on the international scene.”* The hiring of Professor Marek Radomski, *“a scientist of high caliber and excellent reputation”*, is seen by the Reviewers as a significant step towards the amelioration of this situation. The Reviewers note that he has already undertaken steps to address the *“precarious research situation”* by hiring new junior faculty with the potential to contribute significantly to the research output and thus the visibility and standing of the School in the future. The Reviewers feel that this development is of utmost importance, in particular in light of the expected funding shortfall at Trinity College and elsewhere in the aftermath of the global economic crisis. They are pleased to note that Professor Radomski has initiated *“an internal discussion on focus and future expansion of select research areas already in existence at the School, such as the nanopharmacology of antithrombotic drugs, platelet-cancer cell interactions, and drug targeting to activated platelets.”* Such focusing efforts will, they feel, make best use of existing resources while offering interesting opportunities for interaction with other departments across the campus (e.g., in nano-engineering and translational research).

The Reviewers are concerned that while access to information databases and electronic journal libraries is excellent, technical support of research and the laboratory infrastructure leave room for improvement. They report that *“despite a large number of technical officers and lab attendants, only a few individuals within this group are actually involved in research projects, unlike before.”* They feel that the current laboratory space is poorly designed for its purpose, that ventilation and safety procedures and installations are in need of improvement, and the separation of office and lab space for the Ph.D. students should be looked into.

3.2 TEACHING & LEARNING

The Reviewers report that *“the existing curriculum in pharmacy, imposed by the Pharmaceutical Society of Ireland (PSI) and currently undergoing an evaluation and review at Aston University in the UK, appears to be up-to-date and adequate towards the training of pharmacists”* and that the Course Management Committee (CMC) is aware of impending alterations to the curriculum due to the evolving changes in pharmacy practise. To ameliorate an apparent imbalance between the time needed by the faculty for teaching and that available for research activities, the School has expressed the urgent need for an extra staff member in pharmacy practice in addition to the two staff members currently present.

The Reviewers feel that teaching is heavily under-funded (by approx. € 2,700 per year per student) and report that there is an apparent lack of funding for teaching equipment. In their discussions with undergraduate students, it was pointed out to them that *“some practicals appear to be disjointed from the respective lectures, and that the relevance of the learning materials, especially in the courses delivered by other departments, would not always be apparent.”* In addition, students were critical of the levels of *“qualification, language skills and overall attitude towards the students of some demonstrators.”*

Some students also reported difficulties in finding placements for the registration year, especially those in remote areas of the country. The Reviewers feel that the tutor system in place at the School is adequate to resolve the majority of problems brought forward by the students and are satisfied that postgraduate courses run by the School are well organised and very successful. They state that *“these courses are providing a stream of income to the School, and offer a means of interaction and an opportunity for networking with industry.”* Although no formal Graduate School has been established, the Reviewers report that *“the supervision of Ph.D. students by the staff and the accessibility of the latter seem to be excellent.”*

3.3 ORGANISATIONAL STRUCTURES AND PLANNING

The Reviewers report concerns and complaints from staff about excess administrative burden due to inefficient support. The Reviewers regret not having had the opportunity to meet with the administrative staff to verify the issues concerned, and recommend *“looking into a swift resolution of those issues in order to free up time that could be used for research and to avoid unnecessary frustration of otherwise highly motivated staff.”*

3.4 RESOURCES

The Reviewers report that *“considering the financial and environmental limitations the School of Pharmacy and Pharmaceutical Sciences is operating under, the staff is doing an outstanding job.”* However, the Reviewers express concern that *“progress in research will be hampered seriously if motivated faculty members do not receive adequate support and recognition in due time.”* The Reviewers suggest that researchers in the School require provision of appropriate housing facilities to carry out research and state that *“the poor quality of the ventilation in the chemistry facilities, the lack of emergency showers (in case of accidental contact with hazardous material, not only fires), the inappropriate fire-protecting blankets provided, and the inadequate temperature control in some of the laboratories are not conducive to carrying out high-caliber research in a safe and reproducible fashion.”*

3.5 SERVICE TO COLLEGE & SOCIETY

The Reviewers report that *“most staff members participate in the activities of a number of college committees and contribute to public debate and public policy.”* Staff members also provide service as members on Editorial Boards and as External Examiners of many higher degrees. In addition, the Reviewers note that staff from the School are involved in extensive academic collaboration inside and outside the college and with other international institutions and feel that apart from a more active involvement in discussions and decision related to the curriculum, no other changes are required.

3.6 RECOMMENDATIONS

The Reviewers make the following recommendations:

3.6.1 Research

- i) *In order to further establish the School as an internationally competitive research unit within the pharmaceutical sciences the Reviewers consider it to be absolutely mandatory to immediately engage in the recruitment of the vacant Chair in Pharmaceutics at the full professorial level, to also immediately create a new Chair in the Practice of Pharmacy and to eventually fill the vacant Chair in Pharmaceutical Chemistry.*
- ii) *The highly motivated junior staff members **must** be given the resources (consumables, earmarked start-up funding) and the appropriate environment (leadership, mentoring, administrative and technical support) to establish themselves as independent researchers and increase their visibility and the standing of the School at the international level.*
- iii) *It is **essential** to focus research activities of the School on areas of existing research strengths. Research activities of junior staff members should be aligned to this evolving strategy. This is imperative in view of the goal to double research output, as defined in the School of Pharmacy and Pharmaceutical Science’s Self Assessment Report.*
- iv) *Procedures should be put into place to increase the active involvement of technical staff in research, e.g., by focused re-training in critical areas in alignment with the evolving research*

- agenda. The Reviewers see room for improvement in the appreciation of and communication with the technical staff to make better use of this untapped potential.
- v) The Reviewers highly recommend assurance, by becoming more actively involved in the planning process, that proper equipment and infrastructure will be made available to researchers from the School of Pharmacy and Pharmaceutical Science in the new Biomedical Sciences building. Likewise, the reviewers deem it necessary to improve the situation within the existing facilities.
 - vi) The addition of the new facilities is seen as an opportunity to create certain core facilities (analytical services, cell culture and sorting, imaging, etc.). In addition to a more optimized use of equipment and consumables, the creation of such facilities could offer new vistas to re-assign technical staff, further the integration of research activities of different groups within the School as well as with outside partners.
 - vii) The reviewers ask the School to consider the establishment of a faculty incentive program to stimulate efforts in research activities.

3.6.2 Teaching & Learning

- viii) In order to reduce their heavy teaching load, the School faculty might consider teaching some undergraduate and postgraduate modules only every two years.
- ix) The CMC must be involved in the definition of the curriculum in cooperation with PSI. The reviewers expect that the presence of the newly appointed chairs will add additional weight to this process. The arrival of new faculty will also result in better balancing of the teaching load.
- x) Excellence in teaching must be rewarded - the School should consider establishing a teaching award in pharmacy.
- xi) To improve the quality of practicals, faculty members should follow teaching activities of demonstrators and provide adequate guidance and training to them. On the other hand, students should be encouraged to come to the practicals prepared using the material made available to them.
- xii) Students should be provided with more guidance as to the relevance of study materials with respect to pharmaceutical sciences and pharmacy, e.g., by an introductory course into the overall curriculum at the start and provision of a "roadmap" for reference use by multiple instructors throughout the curriculum.
- xiii) Potentially contentious issues arising may be subject to conflicts of interest. To allow the resolution of such issues, we recommend nominating at least one tutor from outside of the School.
- xiv) Efforts should be increased to advertise the postgraduate courses. Revenues obtained by these courses could be put to better use for direct support of research of junior faculty. Contacts with industry should be exploited for common projects as a further source of income and scientific interaction.
- xv) The School should consider establishing an internationally competitive Ph.D. program with a regular high-calibre seminar series, transferable skills modules (including e.g., record keeping, scientific writing and presentation, time and project management), and mandatory enrolment in at least one college course unrelated to the individual Ph.D. student's research subject.
- xvi) The progress of Ph.D. projects should be monitored by two additional staff members.

Of all of the recommendations listed above the Reviewers consider the following measures to be of utmost importance:

- xvii) Appointment of senior staff members to provide mentorship, leadership, and lend credibility to the School.
- xviii) Providing internal seed funds for junior faculty to allow organic growth of research activity, enable staff to prepare internationally competitive grant applications, and capitalize on the motivation and enthusiasm of the junior faculty at the current critical stage of the development of the School.

4. RESPONSES FROM THE SCHOOL & THE DEAN OF HEALTH SCIENCES

The Head of School welcomes the report and the Faculty Dean is pleased with the Reviewers' comment that '*considering the financial and environmental limitations the School of Pharmacy is operating under, the staff is doing an outstanding job.*' With regard to the Reviewers' recommendations concerning Chair appointments in the School, the Head of School reports that the School is currently attempting to raise money from various sources to address these issues which have been under discussion in the School for some time. With reference specifically to filling the vacant Chair in Pharmaceutics, the School has identified sufficient resources and will move forward to recruit this position as soon as the moratorium on recruitment is lifted. The Dean of the Faculty believes that the review has highlighted an important issue for the School which must be addressed as a matter of urgency. He feels that the low outputs are linked to an imbalance in the staff mix between junior and senior staff and that it is imperative, and of strategic importance, that the appointment of senior staff be made to the school to enhance its research outputs and to sustain increased productivity into the future.

The Reviewers recommend that "*junior staff must be given the resources and the appropriate environment to establish themselves as independent researchers and increase their visibility and the standing of the School at international level.*" The school reports that College provides a start-up fund for new academic staff on a competitive basis. In addition, the School has recently identified some funding from its overhead account which it will use to assist junior staff members and it is envisaged that the increase in potential research collaborations will assist in raising start-up monies. The Dean of Research has been made aware by the Head of School of the need for start-up money and the Faculty Dean agrees that the use of seed funding for junior staff research should be encouraged. The School and the Faculty Dean recognise the merits of the Reviewers' recommendation to focus and optimise resources by working together in carefully chosen areas of research and the School gives an undertaking to encourage staff with less established research profiles to align with the strategic strengths in the School. However, the School also defends the right of Principal Investigators to define their own research. The Head of School reports that there is a commitment to increase research output but only in terms of excellence by continued collaboration and by encouraging students to publish as often as possible.

With regard to the Reviewers' recommendation to put procedures in place to increase the active involvement of technical staff in research, the School states that some of the Technical Officers have previously been involved in research activities as evident in the co-authorship in a number of peer-reviewed publications. The School believes it can "*explore avenues to encourage other Technical Officers to become more research-active by identifying skills and by focusing on working as a team.*" The School is currently reviewing the entire system with a view to increasing the time and availability of the Technical Officers and the Laboratory Attendants to become more actively engaged in research. The Dean of the Faculty is of the opinion that "*the involvement of technical staff in research should be facilitated especially given their availability as a resource to the school.*" Currently, the School is involved in the planning and decision making process in relation to the new biomedical sciences building. The Head of School feels that "*the assurance that proper equipment and infrastructure will be made available to researchers from the School ultimately is in the hands of College Officers like the Dean of Research.*" However, he also states that the School is looking to continuously improve the health and safety standards and working conditions of its existing facilities. With regard to the Reviewers' recommendation that the School should consider the establishment of a faculty incentive programme to stimulate efforts in research activities, the Head of School reports that a proposal to introduce a Research Supervision Award is included in the updated College Strategic Plan (2009 – 2014). In addition, the proposal, which is being developed by the Graduate Studies Office and the Centre for Academic Practice and Student Learning (CAPSL) will award excellence in Research supervision and all forms of doctoral research supervision will be considered. Apart from College schemes that can be tapped into, the School will discuss its own ideas and options to stimulate efforts in research activities.

With regard to the recommendation that "*in order to reduce their heavy teaching load, the School faculty might consider teaching some undergraduate and postgraduate modules only every two years*", it is the view of the Director of Teaching and Learning (Undergraduate) that it would only be possible to introduce this change to the Pharmacy degree in the current course structure in the context of significant course redevelopment. The Reviewers recommend that the Course Management Committee "*must be*

involved in the definition of the curriculum in cooperation with the PSI.” The Head of School reports that recent interactions with the Pharmaceutical Society of Ireland (PSI) would suggest that they are keen to have a partnership approach with Schools of Pharmacy and that the School will have a greater input into curriculum definition and design in the future. The Dean recognises the need to increase the staff in the area of Pharmacy Practice to take account of the regulatory needs of the profession as dictated by the PSI, and states that *“it is to be regretted that teaching funds are not adequate to the increased needs of the curriculum.”* While the School sees the value of teaching awards as incentives to promote excellence in teaching, the Head of School reports that teaching awards already exist at College level and feels that *“there may be little value in introducing additional awards at a local level, when the numbers of teaching staff are relatively small.”*

With regard to the Reviewers’ concerns about the teaching activities of demonstrators, the School reports that while all practical classes are supervised by at least one academic staff member, *“staff will be advised to closely monitor the teaching activities of postgraduate demonstrators.”* In addition, *“students will be encouraged to report any deficiencies with regard to demonstrator input as soon as they arise.”* The Head of School advises that *“the necessity to come to practical classes prepared and with background study and research already undertaken will be emphasised to the students and tested, where appropriate, by means of short quizzes at the start of practical classes.”* Students will have access to laboratory manuals before the practical classes begin and the School will implement instruction sessions for Teaching Assistants (TAs). School Teaching Assistant awards will be introduced as an incentive to TAs to perform well in their teaching duties. The Head of School reports that *“an introductory session will be delivered at the start of each year of the undergraduate programme, which will provide students with guidance regarding the content of the various modules to be undertaken in a particular year and indicating their relevance and integration with the programme as a whole.”* In addition, a roadmap will be prepared for use by all instructors which will enable them to indicate where and how their particular course fits in to the programme. The School confirms that all module coordinators will be requested to provide an introductory lecture to provide information on how each module integrates within the overall course. The Head of School reports a perception among student representatives that a conflict of interest may prevent a tutor from interacting with a fellow staff member/colleague on behalf of the tutee. The School states that it is the policy among tutors to vacate their tutor post when a general conflict of interest arises e.g. on becoming Director of Teaching & Learning (Undergraduate). The tutors feel that the interests of the students are best served by a tutor from within the School who is familiar with the academic structure and requirements of their course but the Head of School points out that it is always possible for individual students to request an alternative tutor (from outside the school if necessary) from the Senior Tutor.

The School reports that it has engaged with the International Office in College to promote its postgraduate courses abroad and that brochures for postgraduate courses will be made available to delegates on visits to Universities abroad from where students can be recruited. The Head of School states that *“revenues from postgraduate courses in the School are used to support active contributors to the delivery and management of the courses. This acts as an incentive for all staff to participate.”* The School does not envisage that revenue from postgraduate courses will be specifically targeted to support the research activity of junior faculty only but will continue to be a useful resource to the School in enhancing research activity when and where possible. The revamped School website will also be utilised for advertising purposes. The Faculty Dean states that *“the success of the postgraduate taught courses is to be welcomed both as an academic achievement and as a source of revenue for the schools.”* He notes with satisfaction that the supervision of PhD students is regarded as ‘excellent’ and he endorses the recommendation that postgraduate courses be advertised more heavily.

The School has established numerous contacts with the Pharmaceutical Industry in Ireland as evidenced in particular by the Annual Qualified Persons in Industry Forum held in the School. The School has initiated an evening with Industry representatives in the School to inform them of the Schools postgraduate courses and training programmes in addition to its research and development activities. The School promotes itself as a potential partner to Industry for R&D and is also pro-actively engaged with the Trinity Foundation in its links with industry. The School reports that it is currently engaged in the development of a structured programme of research oriented modules and generic skills activities for postgraduate students. It states that *“development of a structured PhD programme will*

prepare and enable the School to engage in international programmes which provide support for PhD programmes such as the EU 7th framework, Wellcome Trust and National programmes including PRTL, HRB and IRCSET.” The school acknowledges that the establishment of an international network of academic sites and industry partners with complimentary and synergistic research interests is the key to gaining international standing for its PhD programme. It suggests that “mandatory enrolment in at least one unrelated College course can be explored in subject areas such as language, IT and business” and envisages that there will be new opportunities for postgraduate research students in College through the proposed Innovation Academy and the on-going development of postgraduate workshops and training programmes offered by CAPSL. The Head of School confirms that progress of PhD projects is currently monitored by two additional staff members and that when students transfer from the MSc to the PhD register, or are confirmed on the PhD register, a panel of two examiners undertakes an examination of the student's performance and progress to date. The School proposes to progress this process further by the identification of a supervision panel at the point of student registration when two additional staff members are nominated as support advisors to the student and as panel members for the transfer or confirmation process.

With regard to the Reviewers' recommendations regarding provision of improved physical and safety facilities, the School reports that there are emergency showers already in place and these are in working order, that appropriate fire blankets exist and that air conditioning has been installed in one laboratory only. The Dean notes that the review identified constraints on resources as a key inhibitor of progress on the research agenda. The School reports that “College is actively working on the introduction of E-strategy which will address the College-wide problem of administrative support.” The Head of School stresses that the School is “very appreciative of the work carried out by the administrative staff” and gives an undertaking that any inefficiency in the system will be identified and addressed as soon as possible as part of the ongoing review of school procedures. The Faculty Dean is concerned that the input of the administrative staff to the review process was not as great as it might have been and notes that the Reviewers felt that the organisational structures needed review to enhance the outputs of the academic staff. The Dean notes with pleasure the reviewers' recognition of the School staff's contribution to college through service on various committees and groups.

5. RECOMMENDATIONS TO COUNCIL AND BOARD

In light of the review report and the responses from the School of School of Pharmacy & Pharmaceutical Sciences and the Faculty Dean it is recommended that:

1. The School of School of Pharmacy & Pharmaceutical Science working closely with the Dean of the Faculty of Health Sciences, and other relevant Academic Officers, should consider the detailed recommendations of the Review Report and draw up an implementation plan² for Council approval.
2. College should instigate a process to determine the effectiveness of the technical support to the School and provide the necessary supports to enable technical staff participate fully in the teaching and research activities.

**Provost
June 2009**

² See *Procedures and Protocol for Quality Review of Schools 2008/09* at <http://www.tcd.ie/vp-cao/qu/qopdf/adrpack2.pdf>