



Memorial  
University of Newfoundland

# School of Pharmacy Program Review

## Self-Study Report

April 2002

### Contact Information:

Dr. Linda R. Hensman, Acting Director  
School of Pharmacy  
Memorial University of Newfoundland  
St. John's, NF  
AIB 3V6  
Phone: 709-777-6571  
Fax: 709-777-7044

# TABLE OF CONTENTS

---

Introduction .....	1
1.0 Background .....	2 - 4
1.1 Historical Perspective of the Programme .....	2
1.2 Strategic Plan .....	2
1.3 Self-Assessment and Accreditation .....	4
2.0 Student Information .....	5 - 7
2.1 Numbers of Students .....	5
2.2 Academic Quality .....	5
2.3 Scholarships and Awards .....	6
2.4 Attrition, Retention, Graduation Rates and Post-graduation Activities of Students .....	7
2.4.1 Undergraduate	
2.4.2 Graduate	
2.5 Student Involvement in Governance .....	7
3.0 Teaching Activity .....	8 - 14
3.1 Undergraduate .....	8
3.1.1 Programmes	
3.1.2 <i>Congruence of curriculum with departmental goals and preparedness of                 student for careers</i>	
3.1.3 <i>Innovations in Teaching</i>	
3.1.4 <i>Collaboration with other Departments, School and Faculties</i>	
3.1.5 <i>Interdisciplinary Programmes</i>	
3.1.6 <i>Student Advising</i>	
3.2 Graduate .....	13
3.2.1 <i>Programmes Offered</i>	
3.2.2 <i>Programme applications, enrolment and graduation patterns</i>	
3.2.3 <i>Congruence of curriculum with departmental goals and preparedness of                 student for careers</i>	
3.2.4 <i>Collaboration with other departments, schools, faculties, universities and                 colleges</i>	
3.2.5 <i>Student demand and enrolment in courses</i>	
4.0 Research and Creative Activity .....	15
4.1 Areas of specialization and strength .....	15
4.2 Awards, honours and recognition for faculty, staff, students .....	15
4.3 Research revenue .....	15
4.4 Connection between research and teaching .....	15
4.5 Other indicators of research and creative activity .....	16

5.0	Professional and Community Service .....	17
5.1	External Activities of Faculty .....	17
6.0	Department Organization and Human Resources .....	18 - 23
6.1	Administrative Organization .....	18
	6.1.1 <i>Administrative Positions</i>	
	6.1.2 <i>Organizational Structure and Relationships with Other Units</i>	
6.2	Faculty Information .....	18
	6.2.1 <i>Number and Type of Appointments</i>	
	6.2.2 <i>Current Faculty Members and Credentials</i>	
	6.2.3 <i>Visiting Faculty</i>	
	6.2.4 <i>Complement Changes in Past 7 years</i>	
	6.2.5 <i>Faculty Age and Retirement Profiles</i>	
	6.2.6 <i>Workloads</i>	
6.3	Support Staff .....	22
	6.3.1 <i>Number and Type of Support Staff</i>	
	6.3.2 <i>Changes in Staff Complement</i>	
	6.3.3 <i>Profile of Positions</i>	
	6.3.4 <i>Age and Retirement Profiles of Support Staff</i>	
7.0	Financial Support .....	24 - 25
7.1	Five Year Analysis of Funding .....	24
7.2	External Revenue .....	24
7.3	Scholarships, Teaching and Research Assistantships to Students .....	25
8.0	Physical Resources .....	26 - 29
8.1	Equipment .....	26
8.2	Library Resources .....	26
8.3	Space .....	27
	8.3.1 <i>Faculty and Teaching Space</i>	
	8.3.2 <i>Student Space</i>	
	8.3.3 <i>Research Space</i>	
8.4	Shared Facilities and Equipment .....	28
9.0	Future Plans .....	30 - 31
10.0	Additional Issues .....	32



## Introduction

---

This self-study document was prepared under the direction of a Steering Committee following the University guidelines for Academic Program Reviews. The report was prepared primarily by Drs. Hensman and Liu using the guidelines provided by the University for academic programme reviews. The Steering Committee reviewed all material, corrected factual inaccuracies and made recommendations for modifications and they approved the final report.

There was undergraduate and graduate student representation on the Steering Committee

The Steering Committee members were:

- Dr. Linda Hensman (Chair)
- Dr. Mohsen Daneshtalab
- Dr. Mohamedtaki Kara
- Dr. Rebecca Law
- Dr. Hu. Liu
- Ms. Krista Butt (Graduate Student)
- Mr. Corey Wiseman (Undergraduate Student)

## 1.0 Background

---

### 1.1 Historical Perspective of the Programme

The School of Pharmacy was established in 1986 and graduated its first class of undergraduates in 1990. Since that time there has been a gradual growth in the undergraduate programme and the development of a small but strong graduate programme.

The School has been challenged over the years in terms of its ability to recruit and retain faculty. Continual changes in faculty and inadequate numbers of clinical faculty have made it difficult to provide consistency in educational experiences. Nonetheless, through the extra efforts of the faculty, students are prepared well for practice.

The programme initially began with one pre-requisite year and four pharmacy years. In 1991 this was changed to two pre-requisite years and three pharmacy years. Significant changes in curriculum which have occurred since the inception of the programme include:

- Redesign of Advanced Formulations course to Pharmaceutical Technology in 1993
- Separation of Professional Practice from Dispensing
- Course in epidemiology changed to pharmacoepidemiology in 1994
- Increase of experiential learning in studentship from 14 weeks to 24 weeks in 1994
- Introduction of seminars presented by 2<sup>nd</sup> and 3<sup>rd</sup> year students and requirement of first year students to attend these presentations
- Re-sequencing of courses to allow for new Therapeutics I in second year which began in winter 1999
- Introduction of Pharmacy electives in 1999

The M.Sc. programme was introduced in 1991 and a Ph.D. programme was approved in 1999.

### 1.2 Strategic Plan

The vision and mission of the School were reviewed at a strategic planning retreat held in June 2001. Specific goals for the period 2001 to 2006 were identified. The plan was revised in March 2002 in response to comments from the site visit report of Canadian Council for Accreditation of Pharmacy Programmes (CCAPP). The strategic plan is provided as supporting documentation to this report. Outlined below are the vision, mission and goals of the School.

## **Vision**

- To enhance individual care and community health through pharmacy education and research.

## **Mission**

- That the School of Pharmacy be a quality leader in pharmacy education, research and professional practice, fostering the development of exceptional graduates for practice and leadership in their profession, the health system and the community

## **Goals**

- To strengthen relationships among the core faculty members
- To strengthen the undergraduate curriculum
- To promote research and graduate education
- To improve relationships with practising pharmacists and other health professionals
- To encourage a commitment to lifelong learning and, in partnership with others, provide opportunities for continuing education
- To improve relationships with the general public
- To improve relationships with the rest of Memorial University
- To develop a process to ensure opportunities to review the Strategic Plan on a regular basis and thus hold all members of the School Community accountable for its implementation

Memorial University of Newfoundland (MUN) is Atlantic Canada's largest University. It has a well defined strategic framework (see Appendix 1) which guides academic units in establishing goals and priorities. This framework defines the vision and mission of the University.

The objectives and mission of the University are clearly defined and may be found on page 22 of the 2001-02 MUN Calendar. Memorial University's strategy to meet the 21<sup>st</sup> century has three themes. These themes are inclusive in that they are intended to apply throughout the University and to break down barriers to communication and cooperation across disciplines, and academic and administrative units. These themes relate to quality, outreach education and community resource. Further information may be found in the university calendar (page 22).

The mission and goals of the School of Pharmacy closely align with those of Memorial University. The themes of "Outreach Education" and "Community Resource" are of particular importance to the School of Pharmacy.

In addition to Memorial University's Mission statement the University has developed a Strategic Research Plan as all universities were required to do for Canadian Foundation for Innovation and Canada Research Chairs funding. This plan is presented in Appendix 1. There is a strong health section in the plan. Emphasis is placed on basic biomedical research, applied clinical research, health services and health systems and population health. There is to be a university wide research assembly in late April 2002 to develop a

university research plan that is more broadly based. To date the School of Pharmacy has not developed its own strategic plan for research.

### **1.3 Self-Assessment and Accreditation**

The School of Pharmacy conducted a very extensive self-assessment in preparation for the CCAPP site visit in September 2001. The complete self-assessment report and findings of the site visit team are provided in the supporting documentation to this report. The previous accreditation site visit was in September 1996. At that time a number of recommendations were made. Some minor curriculum changes were undertaken in response to that review but few other changes were made (as was noted by the 2001 site visit team).

Although the 2001 CCAPP site visit team noted that many of the standards for accreditation were not met, our graduates attain high success rates on provincial and national examinations. Our graduates have established a good track record of success in entering and completing post-graduate educational programmes. Additionally, our students are highly competitive and successful in national student competitions. We recognize that there are many areas for improvement in the programme but we believe that the quality of our graduates is comparable to that of other faculties of pharmacy in Canada.



## 2.0 Student Information

---

### 2.1 Numbers of Students

The current enrollment in the undergraduate programme is 112 (1<sup>st</sup> year: 39, 2<sup>nd</sup> year: 32, 3<sup>rd</sup> year: 41) all of whom are full-time students. When the School was first established in 1986, 25 undergraduate students were admitted to the programme. This gradually increased until 1998 when first year enrollment peaked at 41 (it was to have been 40, but an administrative error resulted in one extra student being admitted). Due to challenges in final year clinical placements first year enrollment was reduced to 36 in fall of 2000. Given the current faculty resources and in particular the state of development of clinical practice in community and hospital pharmacy in the province this number is reasonable. However, because of the high demand for the programme and its graduates it would be desirable to return to 40.

There are seven students enrolled in the M.Sc programme at this time all of whom are full time.

### 2.2 Academic Quality

The academic quality of the students admitted to the undergraduate programme has been consistently high and is based on a calculated index score (40% average of 20 required courses + 40% cumulative average of all courses taken + 20% PCAT Composite Score). The minimum calculated indices for admission over the last six years have been summarized in Table 1.

<b>Table1: The minimum calculated index for admission</b>	
<b>Year of Admission</b>	<b>Minimum calculated index</b>
2001	75.6
2000	73.5
1999	75
1998	77.1
1997	75.8

The School attracts many individuals who have completed undergraduate degrees. These tend to be primarily in the areas of biochemistry, biology, chemistry. Some of our students have also completed graduate degrees. Table 2 presents the number of students who have previously completed other degrees prior to admission.

<b>Table 2: The number and percentage of students admitted with undergraduate degrees</b>			
<b>Admission Year</b>	<b>Number of Students admitted</b>	<b>Number of students with undergraduate degrees</b>	<b>Percentage of Applicants admitted</b>
2001	36	7	35.3%
2000	36	13	36 %
1999	40	11 ( 3 with Masters)	27.5 %
1998	41	8	19.5 %
1997	40	3	7.5 %

### 2.3 Scholarships and Awards

The School of Pharmacy has an impressive number of scholarships and bursaries for the relatively small number of students (see Appendix 2). Information on the awards is provided in the Memorial University Calender. In addition, under certain circumstances, financial aid may be made available from the School's Faculty Education and Research Trust fund.

In the past two years our students (Megan Turner and Richard Cashin) have been the first place winners in the Pharmacy Practice Commitment to Care Awards for Student Leadership.

Over the years our students have also done well in the national Canadian Association of Pharmacy Students and Interns (CAPSI) competitions. Table 3 provides further detail.

<b>Table 3: Success in National CAPSI Competitions</b>		
<b>CAPSI National Competition</b>	<b>Year</b>	<b>Place</b>
Compounding	2002	2 <sup>nd</sup>
	1998	4 <sup>th</sup>
	1997	1 <sup>st</sup>
Patient Interview	2002	2 <sup>nd</sup> and 4 <sup>th</sup>
	1997	1 <sup>st</sup>
	1995	2 <sup>nd</sup>
	1990	1 <sup>st</sup>
Pharmaceutical Care (introduced in 2000)	2002	2 <sup>nd</sup>

## **2.4 Attrition, Retention, Graduation Rates and Post-graduation Activities of Students**

### *2.4.1 Undergraduate*

Appendix 3 provides information on the number of students admitted and graduated, as well as failure and attrition rates for the past several years.

We have had extremely high rates and most students progress normally through the programme and graduate after the third pharmacy year. Very few students have been required to withdraw because of unsatisfactory academic performance. Some students have repeated a year but again these numbers are low.

Most students successfully complete the PEBC qualifying examinations on the first attempt (see Appendix 3).

Upon graduation, most undergraduate students pursue careers in community or hospital practice. Some have chosen to complete residencies, and/or post-graduate education. Appendix 3 provides information on the number of students and the nature of these pursuits.

### *2.4.2 Graduate*

Of the 18 students who have been enrolled in the M.Sc. Programme since its inception (not including current students), six have not completed the requirements for the degree. Two have chosen to pursue Ph.D. degrees elsewhere, while others have moved to industry (2) or community practice (2). Those who have completed their programme have entered Ph.D. programmes or industry. See Appendix 4 for details. The lack of a Ph.D. programme was one of the possible reasons we could not retain our best students in the past. Loss of several faculty members, lack of research space, insufficient offerings of graduate level courses, poor funding and geographical disadvantages of Newfoundland are also believed to have contributed to the problem.

## **2.5 Student Involvement in Governance**

All committees of the School, with the exception of the Awards and Joint Studentship Committees have student representatives. There is student representation on the Executive Committee for appeals only. Students are asked to participate in self-study processes associated with accreditation and academic programme reviews. Because the School is small, there is a close relationship between faculty, staff and students and they are not hesitant to express matters of concerns or present issues to the faculty or Director on a formal or informal basis.

### 3.0 Teaching Activity

---

#### 3.1 Undergraduate

##### *3.1.1 Programmes*

The School of Pharmacy offers only one undergraduate programme leading to a degree of Bachelor of Science in Pharmacy. It utilizes a five year programme framework consisting of two years of pre-pharmacy education and three years of pharmacy. The complete course of study for the Bachelor of Science in Pharmacy programme is presented in Appendix 5.

In addition to course work, students participate in an experiential learning programme which is the most extensive of any Pharmacy programme in Canada. Students complete two studentships of 12 weeks (420 hours) duration after each of the first and second years of the programme. Primary sites for the studentships are hospital and community practice. Students may complete one studentship in industry or research. During the final year of the programme, students participate in a clinical clerkship, primarily in an institutional setting, which is of 12 weeks duration.

The programme offered to students complies with that outlined in the University Calendar with the exception of pharmacy elective requirements. Due to human resource constraints, since the Winter 2000 semester the School has been unable to offer pharmacy electives. Thus the requirement for completion of a pharmacy elective has been waived.

##### *3.1.2 Congruence of curriculum with departmental goals and preparedness of student for careers*

The principal focus of the School of Pharmacy at Memorial University is to prepare students to enter the Pharmacy profession by providing a high quality education and experiential learning programme. This is in keeping with the mission and goals of the School. The primary focus of the programme is to graduate “generalists” with the education, skills and abilities to practise in whichever setting they might choose, be it hospital, community, industry or government. Additionally, the extensive basic medical and pharmaceutical sciences component of the programme, coupled with summer research opportunities adequately prepares students to enter research and graduate studies.

The programme is based on the premise that the ability to practise pharmacy requires an understanding and application of the basic sciences and a broad education in the arts and humanities. This philosophy is evident in the undergraduate admission requirements which include mathematics, the natural sciences and a range of other subjects. This philosophy is maintained throughout the three year pharmacy programme. The programme is also based on the belief that the skills and competencies required to practise pharmacy extend beyond the basic sciences. Accordingly, the programme integrates the teaching of pharmaceutical, medical and managerial sciences with pharmacy practice. Experiential learning opportunities in each year require the student to

demonstrate the skills and competencies necessary to practise pharmacy as an integral member of the health care team. This process allows a student to recognise his/her professional and societal responsibilities and develop empathy and understanding for patients, to adapt from being a passive observer to an active participant in decision making and the delivery of care and to recognize the need and learn the techniques required for lifelong learning. The programme challenges the student to become an effective communicator both orally and in writing.

When the Pharmacy curriculum was developed in the late eighties and subsequently changed in the early nineties, educational outcomes for Pharmacy programmes, as we know them today, were not available. The programme therefore adhered to the normal curriculum content for North American Schools of Pharmacy and included all the components recommended by the *Commission to Implement Change in Pharmaceutical Education* (AACP - March 1991). Once the Association of Faculties of Pharmacy of Canada (AFPC) adopted the *Educational Outcomes for a Baccalaureate Pharmacy Graduate in Canada*, the School held a Retreat to review and discuss the implications of their adoption to the Pharmacy curriculum. There was general agreement that the graduates of the MUN programme should meet the AFPC Educational Outcomes. Since the Retreat, a number of changes have been made to courses in order to ensure course content aligns with the outcomes. As part of a curricular review which is presently ongoing, the faculty will be discussing the formal adoption of the AFPC educational outcomes as exit outcomes for the programme.

Students are made aware of the outcomes they are expected to meet through the provision of an orientation manual which contains the educational outcomes. All the evaluation tools used to judge student performance during studentship and clerkship are based on the AFPC educational outcomes so this is another avenue by which students are made aware of the outcomes.

As part of the self-assessment process for the accreditation site visit we conducted a survey of our graduates, from 1996 onwards, to determine their perception of their preparedness for practice, assessment of the programme, involvement in innovative practice and pursuit of post graduate studies. From these responses, it is apparent that many graduates have pursued further pharmacy related education, either in formal academic settings or through professional development programmes. Many have advanced the profession and implemented pharmaceutical care programmes in their practice settings. A number of graduates have completed professional development courses in the areas of disease management (asthma, diabetes, cardiac health), complementary medicines, compounding (Professional Compounding Centers of America), human nutrition and geriatric pharmacotherapy.

Based on the survey, the graduates' perceptions of their preparedness to practise is variable. A number of programme weaknesses and deficiencies were identified and we have begun to respond to some of these by making minor changes in course offerings. A full curriculum review is warranted to address these completely. This process has just begun.

We believe the Pharmacy programme at Memorial University meets its goal of graduating individuals who possess the knowledge, abilities and skills to enter pharmacy in a variety of practice settings. The extensive experiential learning programme makes our graduates extremely attractive to employers. The graduates of the programme presently work in many provinces within Canada and in the United States. Many have established new practices and developed patient-focussed programmes and several have pursued higher education

### *3.1.3 Innovations in Teaching*

There have been a number of curricular innovations introduced by the faculty over the past few years. A brief overview follows:

- Continued development of a third year interdisciplinary project which is now in its sixth year. The introduction of a first year interdisciplinary project, now entering its fourth year.
- Group learning activities and discussions are promoted in Pharmacy 3011, 4006 and 5009.
- Tutorials in Therapeutics I and II (Pharmacy 4104 and 5104)
- Expansion of self-assessment processes in selected courses. We need to consider mechanisms by which it becomes part of the evaluation of students.
- Computer assisted learning strategies have expanded. Pharmacy 4006 utilizes Web-based interactive teaching modules. There are plans to implement computer-assisted teaching in Pharmacy 4010, 4011 and 4005 (Medicinal Chemistry and Chemotherapy).
- Most faculty have recognised the need to highlight the practical application of lecture material to pharmacy practice. The clinical sciences continue to expand the use of cases, tutorials, workshops, and patient counselling and interviewing sessions, etc. to achieve this goal. The basic and pharmaceutical sciences have also taken initiatives in this area with plans for further expansion and development. For example Pharmacy 4009 and 5009 require students to apply their skills to critically evaluate the medical literature. The instructor for Pharmacy 3012 has been working with clinical faculty members to help illustrate to the students the practical applications of physical pharmacy to pharmacy practice. Pharmacy 4010, 4011 and 4005 have become more interactive and challenge the students to apply their knowledge of medicinal chemistry principles to enhance the rational selection and use of medications.

### *3.1.4 Collaboration with other Departments, School and Faculties*

The School relies heavily on other academic units to provide teaching to support its programme. Chemistry provides courses required as pre-requisites and one course in the Pharmacy programme. Biochemistry and Medicine contribute significantly to pharmacy education. Most of the courses which are offered by these disciplines have been designed specifically for pharmacy students and are not available to other students. Some of the biochemistry courses share a common lecture component with other biochemistry courses but pharmacy students do not complete the laboratory sessions.

See Appendix 6 for a summary of teaching provided by other units.

Several members of the School are involved in the education of students in the other health care programmes at the undergraduate as well as the graduate level. Lectures on pharmacy jurisprudence, prescription writing, pharmacokinetics, drug use in organ failure, geriatric drug therapy, drug interactions and appropriate antibiotic use are some examples of the types of lectures provided to the medical students by pharmacy faculty. Nursing students also benefit from the faculty's expertise in drug therapy through the provision of lectures. Additionally, some of the clinical faculty teach clinical clerks and medical residents, both in the classroom and the clinical setting. The School liaises as necessary with the different disciplines which teach in the programme in terms of student progress and curricular needs.

### *3.1.5 Interdisciplinary Programmes*

There are four health care programmes at Memorial University (Medicine, Nursing, Pharmacy and Social Work). In September 1999, the Directors of the Schools of Nursing, Social Work, Pharmacy and the Deans of the Faculties of Education and Medicine established a Centre for Collaborative Health Professional Education. The Centre was created in response to:

- a growing emphasis on interdisciplinary health care and the need for interdisciplinary health education programmes
- the requirement of professional accrediting bodies for rigorous educational evaluation
- the need to incorporate and evaluate educational innovations such as computer-based and distance education, problem-based learning and simulated patients
- recognition that education is a legitimate and valuable academic focus

The Centre is composed of a Director and Scholars with relevant expertise appointed from Medicine, Nursing, Pharmacy, Social Work, and Education. The Centre Director and Scholars meet regularly to interact, learn and plan together in a collaborative atmosphere.

The Centre is currently establishing a problem-based Master's programme in interdisciplinary health education, which utilizes web resources and distance education. It is also looking to increase interdisciplinary practice experiences for undergraduate students. In addition, the Centre has regularly scheduled Journal Clubs and Seminar Series.

Interdisciplinary health education projects have been developed by individual faculty members who have recognized that such projects are critical for the successful integration of health care disciplines in the practice setting. There are interdisciplinary projects required in both the first and final year of the Pharmacy programme. The first year project is intended to develop an appreciation of the various disciplines in health promotion and illness prevention. The final year project which has been in existence since 1996 focusses on an interdisciplinary approach to managing patients with HIV.

Whenever possible, shared learning opportunities are sought and encouraged.

Other examples of cooperation between the health and other academic disciplines is a recent initiative to develop a Masters programme in Health Services Research. A collaborative proposal between three Universities in Atlantic Canada (MUN, University of New Brunswick and Dalhousie) was successful in obtaining seed funding of \$400,000 over five years. In addition to the four health disciplines, the faculties of Arts (Political Science, Economics) and Business at Memorial and the Department of Health and Community Services of the Government of Newfoundland and Labrador were involved in the development of the programme.

Being developed concurrently is a Masters programme in Health Services Management. This is also a collaborative initiative with many of the same partners as the Masters in Health Services Research. The School of Pharmacy has a representative on the planning committee.

The Newfoundland & Labrador Centre for Applied Health Research (NLCAHR) was established in September, 1999 as a partnership among Memorial University, the Department of Health and Community Services of the Government of Newfoundland and Labrador (the provincial ministry responsible for health care) and the HCCSJ. The Centre is governed by a Management Board consisting of representatives of the three founding partners as well as of other community institutions and organizations. The Centre's activities are managed by a Director who is a member of the faculty of Memorial University. The Centre's mandate is to increase the capacity of the province of Newfoundland to carry out high-quality research on applied health issues. The NLCAHR is keen to encourage the formation, and support the functioning of interdisciplinary and inter-Faculty research teams within the University working on a broad range of health-related questions.

### *3.1.6 Student Advising*

Students with personal problems or academic difficulties often approach the Administrative Staff Specialist for help, but any faculty or staff member is available for assistance. The School does not assign specific faculty to students as advisors. Students are free to approach any faculty member with whom they feel comfortable. After the fall semester, the Director meets with students if their academic standing is such that they may have difficulty meeting promotion requirements. Support and direction is provided to a student at this time.



## 3.2 Graduate

### 3.2.1 Programmes

The School of Pharmacy offers an M.Sc. programme in the following areas: pharmaceuticals, drug targeting, neuropharmacology, medicinal chemistry and natural products, radiopharmaceutical chemistry, and clinical pharmacy. It also has approval for a Ph.D. programme.

### 3.2.2 Programme applications, enrolment and graduation patterns

The M.Sc. programme was introduced in 1991 and has since become an integral part of the School's academic offerings. Eleven students have graduated from the M.Sc. programme. Information on our graduate enrollment is summarized in Appendix 4. In 1999, a Ph.D. programme was approved.

Although relatively new, the M.Sc. programme has attracted top quality students. Every year, about 30-40 completed applications are received for admission. Because of limitation of space, funding and available faculty resources, only 2-3 new students can be admitted annually. Six students (representing 33% of our graduate student population to date) have been awarded prestigious national scholarships funded by Canada's Research Based Pharmaceutical Companies Health Research Foundation (Rx&D-HRF, formerly known as the Pharmaceutical Manufacturers Association of Canada-HRF, PMAC-HRF) and the Canadian Institute of Health Research (CIHR, formerly the Medical Research Council of Canada, MRC). It should be noted that six of these scholarships are awarded annually across Canada on the basis of academic standing and research potential. In addition, two students were awarded foreign government scholarships.

Generally speaking, our students publish two to four peer-reviewed papers from their M.Sc. thesis research. The quality of their work has been acknowledged by external examiners, and by colleagues in the field. Five graduates from our M.Sc. programme are currently registered as Ph.D. candidates at various universities, five are employed in the pharmaceutical/biotechnology industry in Canada and the United States, and others are working in health care research/delivery related fields. Considering the modest size and relatively short history of the M.Sc. programme, this record of success is significant.

Based on our success in the M.Sc. programme, the School proposed the introduction of a Ph.D. programme. After a vigorous evaluation by the internal and external experts, a Ph.D. programme was approved in 1999. Recently one student transferred from the M.Sc. to the Ph. D. programme.

### 3.2.3 Congruence of curriculum with departmental goals and preparedness of student for careers

Most graduate students in the School are in three major areas: drug delivery, medicinal chemistry and pharmacology. At present, four graduate courses are offered by the School. They are Pharmacy 6000 (Advanced Medicinal Chemistry), Pharmacy 6002

(Advanced Pharmaceutical Formulations), Pharmacy 6003 (Pharmacokinetic Modelling), and Pharmacy 6101 (Pharmaceutical Biotechnology). With the exception of Pharmacy 6000 these are not separate courses but enriched undergraduate courses. The lack of courses for our graduate programme was a big concern for external reviewers who evaluated our application for a Ph.D. programme in 1999. It would be desirable to offer more courses but we are limited by faculty resources (since 1996, the School has had a net loss of three basic science faculty members). There are courses in other disciplines available to our students which complement the programme. In 2000, a special topics course (Spectral Analysis) was offered by an Adjunct Professor of Biochemistry.

### *3.2.4 Collaboration with other departments, schools, faculties, universities and colleges.*

Since the School is small, its faculty members conduct collaborative research with members of other academic units in the University including the Faculty of Medicine, School of Nursing and Departments of Biochemistry, Chemistry, Psychology of the Faculty of Science.

The School of Pharmacy is located in the Health Science Centre (HSC) which also houses the Faculty of Medicine, the School of Nursing, the Health Science Library, the Animal Care Facilities and the General Hospital of the Health Care Corporation of St. John's. A newly built child health and rehabilitation centre was recently added to the HSC complex. Such an integrated complex, unique in Canada, provides an easy access to various necessary facilities and expertise as required for the research activities in the School. Cohesive collaboration and assistance from the Cancer Research Group and Terry Fox Cancer Research Lab, Cardiovascular Physiology Group, Molecular and Immunological Virology Group, and Nuclear Medicine of the Faculty of Medicine have been proven to be very effective.

### *3.2.5 Student demand and enrolment in courses.*

Students are not always able to register for courses they would like to take, as they are not offered each year. Additionally some concern has been expressed that courses are not well advertised when they are offered. This has been an area of concern for some students.

## 4.0 Research and Creative Activity

---

### 4.1 Areas of specialization and strength

The pharmaceutical research areas in the School of Pharmacy are in drug delivery, neonatology, medicinal chemistry of anti-cancer and antimicrobial and pharmacology of spinal allodynia. The drug delivery research group is the strongest group in the school.

### 4.2 Awards, honours and recognition for faculty, staff, students

In 1997, Mr. Abdul Kader, an M.Sc. student, received the University Medal for Excellence in a Thesis-Based Masters Programme. These medals recognize the highest achievement by graduate students at Memorial University of Newfoundland.

Mr. Ashish Sharma, an M.Sc. student, received the Association of Faculties of Pharmacy of Canada (AFPC) Award for the Best Student Research Poster presented at the 1998 AFPC Conference. Since 1993, six graduates have been named Fellows of the School of Graduate Studies.

The School has access to funding for undergraduate students to participate in undergraduate summer research projects with faculty. The number of students participating each year is variable depending on the number of faculty available to supervise. Funding comes from Burroughs Wellcome, Rx&D/CIHR Health Research Foundation and Apotex. Appendix 4 lists the number of students and faculty supervisors who have participated in these summer programmes over the past few years.

### 4.3 Research Revenue

The School has received over \$1.6 million in research funding over the past six years. Details on this revenue is presented in Appendix 7.

### 4.4 Connection between research and teaching

Good teachers need to be good scholars and active researchers. For our graduate courses it would be difficult to envisage a situation where research is not intimately tied to teaching. Undergraduate courses such as pharmaceutical technology are directly related to the latest research in drug delivery. Scholars/Researchers are more aware of current trends in areas of specialization and have the potential to provide a more stimulating learning environment for students.

The two interdisciplinary projects in which the clinical faculty are involved are providing opportunities for research into collaborative health professional education. At two clinical meetings, Dr. Law has presented the poster “Interdisciplinary Problem-based Small Group Teaching for Medicine, Pharmacy, Nursing and Social Work” which was result of one of the interdisciplinary initiatives.

#### **4.5 Other indicators of research and creative activity**

Dr. Daneshtalab has recently established a collaboration with a Japanese pharmaceutical company the objective. This objective of this work is to discover and develop agents which are effective against systemic and invasive fungal diseases. The chemistry and preliminary biological analysis will be done in Dr. Daneshtalab's lab, with secondary screening, animal testing, pharmacokinetic studies, etc. being done by the company in Japan. If the initial studies yield promising agents then these will be developed in Japan. This arrangement is initially for a three year period and will provide \$250,000 in funding over the period. The Japanese company will support the salary of one post-doctoral fellow (PDF) at MUN. They will also send one of their scientists (as a PDF) to participate in the research with Dr. Daneshtalab's group.

Dr. Daneshtalab collaborated on a successful multicentre CFI Infrastructure grant valued at \$897,000. The focus of the work associated with this project is the isolation, identification as well as pharmaceutical and nutraceutical applications of fishery byproducts.

### 5.1 External Activities of Faculty

The University recognizes the benefits which may be derived from external professional activities but it is clear that it must not interfere with the primary obligations of the academic staff member to teaching, scholarly activity and academic service. Some of the faculty members of the School engage in outside consulting.

The majority of faculty members are active in professional and research organizations on a provincial, national or international level. Several of the faculty members are regularly asked to provide continuing education sessions to the pharmacy community. The individual curriculum vitae are provided in the supporting documentation and illustrate the scope and nature of these activities.

Two faculty members (Drs. Law and Hensman) teach pharmacology in the Centre for Nursing Studies Nurse Practitioner programme.

Two of the clinical faculty members (Drs. Kelly and Phillips) have practices at sites within the HCCSJ. One of these is in HIV and Continuing Care and the other is in Psychiatry. Each receives a stipend from the HCCSJ for the clinical services they provide. These individuals also participate in various committees and departmental planning events relevant to their scope of practice.

Dr. Kara serves on the Expert Advisory Committee on Bioavailability and Bioequivalence for Health Canada.

Dr. Kelly serves as a reviewer of home study continuing education programmes for the Canadian Council of Continuing Education in Pharmacy (CCEPP). She has delivered numerous continuing education seminars and workshops for pharmacists.

Since 1998, Dr. Daneshtalab has been a member of editorial board of the international journal *Current Opinion on Infectious Diseases* published by Current Drugs.

Dr. Liu was a member of the MRC Pharmaceutical Sciences Peer-Review Committee from 1997-2000.

Dr. Law has been the Editor of the Association of Faculties of Pharmacy newsletter since 1997. She currently serves as a reviewer for submissions to *Pediatric Research and Pharmacy Practice*. She served on the Advisory Board of Pharmacy Practice National Continuing Education Program for 4 years. She has served as a reviewer for other publications and continuing education programs including CCCEP. She has provided numerous continuing education sessions for pharmacists. She has been a contributor to each edition of the casebook *Pharmacotherapy: A patient-focused approach* and the accompanying *Instructor's Guide*.

## 6.1 Administrative Organization

### 6.1.1 Administrative Positions

Administrative faculty positions include a Director and Associate Director. From 1991 to 1998 there was an Associate Director for research and graduate studies. In 1998, with the appointment of a new Director, the focus of the Associate Director's position was in pharmacy practice, as this was viewed to be complementary for the new Director. The Director and the Associate Director are appointed for a five year and three year term respectively. After one term if the incumbent expresses a willingness to continue a review is conducted. A search is conducted after two terms have been completed.

### 6.1.2 Organizational Structure and Relationships with Other Units

Since the School of Pharmacy is extremely small, the organizational structure is simple. This is presented in Appendix 8.

The Director reports to the Vice-President (Academic). Through the Deans' and Directors' meeting and the Senior Academic Administrators Group (SAAG), the Director is kept updated on the activities of the other academic units on campus and vice-versa. Meetings with the three other health sciences faculties Deans/Directors permit the exchange of information common to such disciplines and this group can serve as a collective voice to advocate on behalf of the health sciences programmes.

Some faculty members have cross appointments with other academic units and vice versa (see Appendix 8).

Collaborative research programmes have been established by some faculty with various departments in the Faculties of Medicine and Science.

## 6.2 Faculty Information

### 6.2.1 Number and Type of Appointments

The present full time equivalent for faculty is 9.3 FTE (see Appendix 8 for details). Of these, 8.3 are tenured or tenure-track and one is contractual. There are 4 FTE faculty in the clinical area (one presently serving as Acting Director) and 5 FTE in basic pharmaceutical sciences. In March, 2001 Dr. C. Loomis was seconded as Vice-President (Research and International Relations). Subsequently in February 2002 he was appointed to the position permanently. While he continues to hold an academic appointment in the School he has been and will continue to be unavailable for teaching and administrative activities. Thus the current faculty complement in effect is 8.3 FTE. The 0.3 FTE represent two minor joint appointments with Medicine in community health and

pathology. The pathology appointment which is equivalent to 0.2 FTE complement is not included in the tables of pharmacy faculty complement.

### *6.2.2 Current Faculty Members and Credentials*

The academic qualifications of full-time tenured or tenure track faculty are presented in Appendix 8. All faculty members have advanced degrees and one has post-doctoral fellowship experience. Further details of qualifications and experience are provided in the curriculum vitae.

### *6.2.3 Visiting Faculty*

The School has developed a strong relationship with Merck Frosst Canada to support visiting professors. Dr. Dale Meisner from Merck regularly visits the School and contributes in the teaching of pharmaceutical technology. We have had a visiting research professor, Dr. Ali Khalaj, from Iran in the fall of 2001 and currently we have Mr. Guohui Cui, an Associate Professor from the School of Pharmacy at the University of Beijing.

### *6.2.4 Complement Changes in Past 7 years*

There has been a gradually decline in the number of in the School over the past seven years. This has presented challenges in teaching and programme offerings. Table 3 details the changes in faculty. Further details on the changes are provided in Appendix 8. Sessional lecturers have been hired on a variable basis to cover teaching in order to provide teaching remissions for administrative duties and research leaves, following resignations of faculty and to cover courses requiring expertise not available in the School. The use of sessionals has increased as faculty complement has declined (see Appendix 8). This is not ideal for the long term. Sessional lecturers have been used in the areas of Medicinal Chemistry, Physical Pharmacy, Pharmacy Administration, Chemotherapy, Toxicology and Therapeutics I. We also use the services of clinical practitioners for teaching in specialty areas and for clerkship supervision.

Although the faculty complement has increased by 1 FTE in the clinical area, with maternity leaves, secondments and reduced support from external teaching sites it has been a challenge to manage 41 students in the final year of the programme which has been experienced during the past two years. Thus the School reduced its admissions to by ten percent (to 36) starting in September 2000. Given the demand for pharmacists this reduction is not acceptable in the long term.

During the past four years, we have added three credit hours of therapeutics, two hours of tutorials in each therapeutics course, undergraduate seminar, more patient interaction sessions and oral examinations. This has been challenging given the limited number of clinical faculty. Additionally since therapeutics is taught in blocks based on subject matter clinical faculty didactic teaching loads over a period of two or three weeks may be excessive.

<b>Table 3 : Faculty Complement 1995 to 2002</b>							
<b>Fiscal Year</b>	<b>1995 to 1996</b>	<b>1996 to 1997</b>	<b>1997 to 1998</b>	<b>1998 to 1999</b>	<b>1999 to 2000</b>	<b>2000 to 2001</b>	<b>2001 to 2002</b>
<b># of Faculty*</b>	11.5	10.5	10.5	10.5	10.6	10.6	9.1
<b>Significant additional faculty*</b>	adjunct	adjunct	adjunct				
<b>Leaves</b>			1 on leave 1 on Admin leave	1 on sabbatical	1 on LTD 1 on parental leave	1 on LTD	1 seconded to VP psn. 1 on parental leave 0.1 on Admin leave
<b>Available for teaching/ admin/research</b>	11.5 + adjunct	10.5 + adjunct	8.5 + adjunct	9.5	8.6	9.6	7
<b>Student enrollment</b>	94	101	107	116	120	117	112

\* Does not include 0.2 FTE position in pathology

Individual with adjunct appointment taught two undergraduate courses (Pharmacy 5004 - Self Medication (3 cr. hrs.) and Pharmacy 5005 - Communication and Counselling (1 cr. hr.)

See Appendix 8 for detailed breakdown

### 6.2.5 Faculty Age and Retirement Profiles

The faculty is relatively young with no impending retirements. A profile of full-time faculty ages by discipline is provided in Table 4.

<b>Table 4: Faculty Age and Retirement Profiles</b>				
<b>Position</b>	<b>26 - 35</b>	<b>36 - 45</b>	<b>46 - 55</b>	<b>56 - 65</b>
Clinical/Pharmacy Practice	1	2	1	
Pharmaceutics/Pharmacokinetics		2	1	
Medicinal Chemistry				1
Pharmacology			1	

### 6.2.6 Workloads

The “normal” teaching load for faculty members at the University is defined in the collective agreement. The equivalent of four, three hour lecture courses per academic year is defined as the norm for faculty in the School. The equivalency is determined by a weighting system which considers the nature of the activity. For example, a three



credit hour lecture course is weighted as 1.5 units, while a laboratory is weighted as one unit. These equivalencies were developed several years ago when they were mandated by the collective agreement. However, these equivalencies have not considered the weighting of teaching associated with clinical clerkship activities such as student supervision, tutorials, case presentations, etc. Clinical faculty spend the majority of time in the winter semester supervising final year students in their clinical clerkship rotations. Additionally some assume responsibility for moderating student case presentations via teleconference. As such it has been extremely difficult to characterize the teaching loads of clinical faculty and an effective system has never been developed.

Assignment of teaching and resulting teaching loads have been variable over the past few years because of changes in faculty, remissions for research and administrative responsibilities. There is considerable variation in teaching loads amongst faculty. Clinical faculty tend to have fewer lectures assigned to them compared with faculty in basic sciences. However, this is more than compensated for by the number of hours of clinical teaching in which they are involved during the clerkship period.

Appendix 9 provides a listing of hours of lectures and laboratories in which pharmacy faculty and staff were involved in teaching during the 2001 - 2002 academic year. In the case of clinical faculty it does not reflect the contact hours with students during clerkship. The number of students supervised during the 2002 clinical clerkship is stated. Other responsibilities are also detailed.

There is considerable variability of teaching loads across academic units of the University and given the inadequacy of the current method of determining workloads and equivalencies within clinical teaching it make comparisons with other units difficult.

It would be desirable to have more clinical practitioners formally appointed to the faculty. This would recognize their contributions in the area of clinical clerkship teaching and supervision and facilitate the teaching of therapeutics without the need to hire additional tenure track faculty. Currently a pharmacist without an advanced degree can be hired in a staff position only. In these positions they are not permitted to teach a course (teaching a course must be done by individuals appointed as sessionals) thus we are restricted in our hiring or incur greater costs as a result. Not all teaching in a professional school requires an individual to have an advanced degree. We presently have a pharmacist hired as a lab instructor which is not reflective of the responsibilities she has been given (i.e. supervises students in clinical placements, teaches and conducts tutorials). Given the current stipends offered to sessional lecturers it is difficult to attract them to these positions. Jointly funded positions with the clinical institutions would be desirable but there are limitations with such positions.

As has been discussed previously graduate course offerings are limited. Faculty in the basic pharmaceutical sciences supervise on average two to three graduate students annually.

## 6.3 Support Staff

### 6.3.1 Number and Type of Support Staff

The Support Staff in the School are:

- Administrative Staff Specialist (1 FTE - permanent)
- Intermediate Secretary (1 FTE - permanent)
- Intermediate Clerk Stenographer (0.5 FTE contractual)
- Research Computing Specialist (1 FTE - contractual)

Teaching Staff in the School include:

- Laboratory Instructor (2 FTE - one permanent and one contractual)
- Studentship Coordinator (1 FTE - permanent)

### 6.3.2 Changes in Staff Complement

The support staffing has remained essentially unchanged over the past seven years. Approximately six years ago a Research Computing Specialist position was created and funded through an external grant. In August 1997 it was converted to a contractual position supported by the School's operating funds. In August 1998 there was a change in the Studentship Coordinator. In August 2001 a lab instructor was hired on a contractual basis to assist in course offerings and clinical clerkship supervision due to a maternity leave and the Associate Director assuming the Acting Director's position.

### 6.3.3 Profile of Positions

An Administrative Staff Specialist provides administrative and secretarial support to the Director. There is an Intermediate Secretary who also provides secretarial services to the Director when needed. She and the Intermediate Clerk Stenographer provide clerical services to the faculty and teaching staff. These positions report to the Director. The Laboratory Instructors liaise with individual faculty and the Associate Director but report to the Director. The Research Computing Specialist (RCS) reports to the Director. The Studentship Coordinator reports to the Associate Director.

There is a Drug Information Centre which is funded externally. The pharmacist in the Centre reports to the Director.

6.3.4 *Age and Retirement Profiles of Support Staff*

The age and retirement profile of support staff are presented in Table 5.

<b>Table 5: Support Staff Age and Retirement Profile</b>				
Position	26 - 35	36 - 45	46 - 55	56 - 65
Administrative Staff Specialist			1	
Intermediate Secretary		1		
Intermediate Clerk/Stenographer		1		
Laboratory Instructor	1		1	
Research Computing Specialist	1			
Studentship Coordinator	1			

## 7.0 Financial Support

---

### 7.1 Five Year Analysis of Funding

A five year overview of the funding for the School of Pharmacy is presented in Appendix 10. In 1998, at the request of the Director, a thorough analysis and review of the School's financial situation was undertaken by the Centre for Institutional Analysis and Planning (CIAP). It was determined that: a) the base budget for 1996-97 was too low when viewed from the context of the allocation model applied at that time; and b) discretionary funding was increasing dramatically over that same period as the grant portion of the budget allocation was cut.

On the basis of this review, the Vice-President (Academic) adjusted the base budget in the 1998-99 fiscal year. Prior to that adjustment, the School had regular deficits of up to \$60,000 per fiscal year. The budget for 2001 - 2002 fiscal year was \$1,225,566, however this was not known to the unit until February 2002.

In 1999, the Vice-President (Academic) announced two major funding competitions:

- 1) a Computing and Infrastructure Programme; and
- 2) an Academic Priorities Programme. Proposals from across the University greatly exceeded the available funding.

The School of Pharmacy was successful in both competitions. A \$65,000 grant from the Computing and Infrastructure Programme was awarded jointly to the Schools of Pharmacy and Nursing. A grant of \$54,500 from the Academic Priorities Programme was also obtained by the School. The grant from the Academic Priorities Programme for a Continuing Education/Professional Development Coordinator for Pharmacy was to have been used as leverage funding in helping secure a Research Chair in Pharmacy Practice. Merck Frosst Canada Inc. had agreed in principal to support this Chair. Unfortunately this could not be pursued because of workload commitments placed on the Director when seconded to the VP (Research and International Relations) position and workload demands on the Acting Director. This funding is no longer available to the School. It is disappointing from a development perspective for the School when opportunities such as these are lost because of a lack of resources to develop proposals.

### 7.2 External Revenue

External research funding to the School has increased substantially over the years. Data from the Office of Research shows that from 1996-1997 to 2000 - 2001, the School received approximately \$1.6 million in funding (see Appendix 7). Two faculty members have held or are currently recipients of external career awards (a ten-year MRC Development Grant that expired in 1999, and a five-year Rx&D HRF/MRC Career Scientist Award expires in 2004).

A number of teaching and extracurricular activities of the School are supported by external grants from the pharmaceutical industry. For example a public speaking programme for first year students has been funded by Merck and Novopharm. The Drug Information Centre has been funded almost exclusively by external grants from associations, government and the pharmaceutical industry. Approximately \$500,000 has been provided over seven years. Other activities supported by external sources include:

- an annual trip by first year students to visit pharmaceutical companies in Montreal and Toronto (\$20,000 to \$24,000 annually)
- the Glaxo Harlow award which supports two final year students to undertake part of the clinical clerkship programme in England.
- new pharmaceutical care-based drug dispensing software for the computer network (Nexxsys).
- funding for renovations to the Professional Practice Laboratory (Shoppers Drug Mart) (\$15,000)
- new audio-visual equipment for Lecture Theatre I (Wal-Mart Pharmacy)

### **7.3 Scholarships, Teaching and Research Assistantships to Students**

As previously mentioned the School of Pharmacy has an impressive number of scholarships and bursaries for the relatively small number of students.

Graduate students are eligible for fellowships and teaching assistantships. Funding for fellowships is provided by the School of Graduate Studies and the School has an annual allocation in its operating budget for teaching assistantships.

## 8.0 Physical Resources

---

### 8.1 Equipment

The major equipment in the School of Pharmacy is listed in Appendix 11.

In terms of computer support for student teaching the School recently expanded the School of Pharmacy computer network, and incorporated a new server-based computer network (Sun<sup>®</sup> Microsystems) in the Professional Practice Laboratory. This network has twenty-one thin client stations providing a range of UNIX/Solaris/Windows-based software including new dispensary management/pharmaceutical care software (Nexxsys Software Pharmacy System).

### 8.2 Library Resources

The primary library resources for the School of Pharmacy programme are provided by the Health Sciences Library of Memorial University. The library collection currently contains over 51,000 books, 1,600 multi-media items, and 1,360 journals and serials. In recent years the number of electronic resources has increased substantially. Document delivery services are provided by the library without charge for obtaining information materials not available on campus. Librarian mediated searching of health bibliographic index databases is provided free to faculty. Free on-campus and remote access to electronic databases and electronic journals is provided to all members of the School of Pharmacy.

In addition to the resources of the Health Sciences Library, the School of Pharmacy has immediate access to the full resources of other branches of the Memorial University Libraries.

The library has consistently passed the scrutiny of accreditation boards of the various constituents it serves (ie, Medicine, Nursing, Pharmacy, etc.). The staff is adequate and there is a reference librarian available during office hours and selected evening and weekend hours to serve the patrons. The library is open after hours and on weekends. The Pharmacy holdings have been checked against the American Association of Colleges of Pharmacy listings and have been kept current. There are few, if any, complaints about the library service from faculty, students or staff. The librarians are eager and willing to assist in the instruction and evaluation of undergraduate students.

In addition to the HSC Library there is a Drug Information Centre in the School which provides support to the faculty and students.

## 8.3 Space

### 8.3.1 Faculty and Teaching Space

Space is at a premium in the School of Pharmacy and there are serious concerns about the adequacy of space. Office space for faculty and graduate students is limited and/or inadequate and social space for all students is lacking. There is no capacity for expansion of research activities because of limited laboratory space. Storage space is at a premium.

All staff and faculty have offices, some of which are shared. For example, the laboratory instructor is located in the general office area. This is not appropriate for student assistance and consultation and has created problems with role definition.

The two classrooms and Pharmaceutics Laboratory in the School have a maximum capacity of 40 students. The Professional Practice Lab can currently handle 20 students. This space doubles as a computer lab. There are serious concerns that 20 students will not be able to be accommodated in the lab once proposed renovations are completed.

The storeroom contains the faculty photocopier and a networked printer. A locked cupboard has been built into the coat rack area of the of the class rooms. There is also some storage space available in the instrument lab.

The Glaxo Learning Resources Centre, a small reading room containing reference material, a printer and scanner, is available as a resource centre for undergraduate and graduate students, faculty and staff.

Since there is there is no university-wide committee which is responsible for reviewing space utilization and dealing with requests from departments and faculties when additional space is required it is extremely difficult to obtain it.

There is a faculty lounge which is shared with the School of Nursing.

Space is one factor limiting growth in the School.

### 8.3.2 Student Space

The Memorial University Pharmacy Society and the local branch of CAPSI have a small office. The students' photocopier is also located in this room. A keypad lock on the door permits the students to have round the clock access to the photocopier.

There is a very small area located in the School of Pharmacy just outside the School's two lecture theatres where undergraduate students congregate prior to classes. It has space for approximately 15 students which is totally inadequate.

Students may book the conference room for meetings and request access to the two classrooms within the School when they are not in use (daytime and after hours).

Upon entry to the School of Pharmacy, students are assigned lockers, which they keep for the three years they are in the school.

Office space for graduate students is non-existent. Many graduate students have very small desk units in the labs which is of concern from the perspective of safety and productivity. There is no social space for these students.

### 8.3.3 Research Space

Presently research space in the School is at a crisis level. There is one pharmacology lab accessed by one faculty member (two graduate students and one lab assistant). One larger pharmaceuticals lab is shared by three faculty members and currently has six graduate students working in it. There is a separate laboratory space for medicinal chemistry. These spaces are small and severely limit the current activities and growth of both research and graduate programmes. Many externally funded research activities (eg. radioisotope work) can not be carried out because of space limitations.

The School of Pharmacy has a small room that is used for animal behavioural testing and there is a separate room for organic synthesis and radiopharmaceutical chemistry. A separate cell culture room has been certified for *in vitro* experiments and an animal room is available to handle radioisotope experiments

## 8.4 Shared Facilities and Equipment

The School has access to lecture theatres and tutorial rooms of both the School of Nursing and the Faculty of Medicine.

Students of the School of Pharmacy have access to two computer laboratories (a 25 seat and 15 seat lab) as part of a shared services agreement with the Faculty of Medicine and School of Nursing. The labs are available for individual use and group instruction. Internet access, printing, personal productivity applications such as word processing, and special applications such as SPSS are available in the labs.

Animal Care facilities are located on the first floor of the Health Sciences Centre, and are fully accredited by the Canadian Council on Animal Care.

The licensed facilities to handle  $^{125}\text{I}$ ,  $^{131}\text{I}$  and  $^{123}\text{I}$  radionuclides are available within the Health Sciences Centre. There are six  $\gamma$ -scintigraphic cameras in the Department of Nuclear Medicine available for radioimaging studies after normal hospital working hours. Electron microscopy, fluorescence activated cell sorting, digital image analysis, gel analysis, confocal microscopy are available in the Faculty of Medicine. The School of Pharmacy has an FT-IR available for characterization of new compounds. Other spectral analysis such as NMR and MS are carried out in the Chemistry Department, Faculty of Science. Other analytical instruments within the School include HPLCs with diode array and fluorescence detectors, fluorescence spectrophotometer, liquid scintillation counter, radioactive TLC/Gel scanner, ELISA reader. The School recently acquired a Beckman Delsa 440 Zeta-Sizer which is used to conduct nanoparticle sizing



and Zeta potential measurement. A high pressure homogenizer (microfluidizer) was also acquired to make fine emulsions, solid lipid particles, and liposomal formulations. In addition, the Science Branch of the Northwest Atlantic Fisheries Centre, the Fisheries and Oceans Canada in St. John's, has a state-of-art ion spray tandem mass spectrometer available for chemical characterization of newly synthesized compounds.

## 9.0 Future Plans

---

The strategic plan clearly outlines the direction the School will take over the next few years. It must correct a number of areas viewed to be deficient by the CCAPP site visit team if it is to develop a programme which will consistently meet the scrutiny of accreditation and external reviewers. The primary focus of its initiatives will be:

**Admissions:** We will develop an admissions process which helps us to identify students who have the necessary skills and attributes to succeed in the programme and become successful practitioners. We want to admit students who have a clear understanding of and commitment to the profession. We also need to ensure that the students we admit will have the necessary critical thinking, problem solving and communication skills essential for success in the programme.

**Curriculum Reform:** We are embarking on a process of curriculum reform. It is our intention to develop an educational outcomes based programme which will ensure that our graduates meet the AFPC educational outcomes. This will require considerable work in reviewing the present curriculum, considering the advantages and disadvantages of moving to a 1 year pre-requisite year and four year pharmacy programme, developing curricular phase, course and lesson outcomes. We will also implement a process for programme evaluation to confirm the curriculum meets our goals and objectives and aligns with our vision and mission.

**Experiential Learning:** Clinical practice is not as well established within institutions in Newfoundland as in other regions of the country and with out migration of pharmacists the School is constantly challenged to ensure consistency and quality in sites used for its experiential learning programme. In order to address some of these concerns the School will develop a preceptor training programme. This programme will assist practitioners in the community to understand the School's educational objectives of the experiential programme and assist them in developing their pharmaceutical care and student assessment skills. It is also our intention to partner with the community to begin to develop model pharmaceutical care practice sites for student education.

Redevelopment of our professional practice lab is critical for us in order to develop a setting where students can practice and develop skills needed for success in the experiential learning programme. This will require a major capital campaign which will be undertaken in the next year.

**Graduate Programme:** We will continue to develop our graduate programme. The Graduate Studies committee has been requested to prepare an action plan to address the current constraints we face with respect to space. Collaboration with other units appears the only means of addressing limited course offerings at this time and this will be undertaken.

**Linkages with the Community:** The pharmaceutical community (practitioners, industry, government, etc.) is a source of both educational and financial support. We will continue to strengthen our linkages with them and establish more formal mechanisms for their input into our programme. Consideration is being given to an Advisory Board(s) of various stakeholders in the community.

**Alumni Association:** The formation of a pharmacy alumni association is long overdue. While we do not view it as our primary responsibility to establish an association we realize the benefits that such an association would bring to the School and we are committed to assisting in its formation.

## 10.0 Additional Issues

---

The major issues facing the School relate to the faculty complement and space.

Recently the Vice-President (academic) approved an additional clinical faculty position (to be cost shared with the Health Care Corporation of St. John's) and a two year contractual position for a pharmacist to assist in the development of preceptor training and model pharmaceutical care sites. The school is negotiating with an individual in pharmaceuticals to fill a position which has been vacant for two years. With the loss of Dr. Loomis as a teaching resource to the unit consideration will have to be given to hiring a pharmacologist. Given that the speciality discipline of the individual who will be hired as the new Director is unknown, it is difficult to determine exact needs at this time. Of concern to the faculty are the challenges it faces when planned or unplanned leaves occur. It is difficult to grant sabbaticals and loss of faculty members due to medical illnesses or parental leave create significant problems.

Our course offerings in the areas of pharmacy administration, pharmacoeconomics, health systems, ethics and complementary medicine are either non-existent or insufficient to meet the needs of today's graduates. We face real challenges in attempting to address these needs as qualified individuals in these fields are scarce and the ability to attract them to Newfoundland is hard. Thus we must utilize practitioners on a sessional basis. There are concerns with this and it is not ideal in the long term.

As has been previously mentioned space is a real concern for the future growth of both the undergraduate and graduate programmes. There is a need for more space for student activities (professional and social) and some space is in dire need of redevelopment (i.e professional practice lab).

The Drug Information Centre, while an independent entity from the School is continually threatened with closure because of unreliable funding. Given the very critical role it plays in the education of our students, consideration should be given by the university to provide a greater level of funding than the current in-kind contributions of space and operating supplies.

*Note: Appendices 1-11 and other attachments are available from the Office of the Coordinator, 737-2178.*