

BIOCHEMICAL EDUCATION IN PHILIPPINE MEDICAL SCHOOLS

Marita V.T. Reyes

The Philippines has 27 medical schools employing 119 faculty members for teaching biochemistry to 3,319 freshmen. Have adequate steps been taken to address problems unique to this situation?

Table 1. Regional distribution of medical schools as of 1985.

Region	School
NCR (National Capital Region)	Philippine Muslim-Christian College of Medicine Fatima College of Medicine Pamantasan ng Lungsod ng Maynila Manila Central University Far Eastern University University of the East-Ramon Magsaysay Medical Center University of Santo Tomas University of the Philippines - College of Medicine
I	Lyceum Northwestern Virgen Milagrosa Educational Institute St. Louis University
III	Angeles University Foundation
IV	Emilio Aguinaldo College Perpetual Help College of Medicine
V	Bicol Christian College of Medicine
VI	Iloilo Doctor's College of Medicine Western Visayas State College
VII	Cebu Doctor's College of Medicine Cebu Institute of Medicine Gullas College of Medicine
VIII	South Western University Divine Word University Remedios T. Romualdez College of Medicine University of the Philippines - Institute of Health Sciences
X	Xavier University
XI	Davao Medical School Foundation
XII	Mindanao State University

As of 1985 there were 27 medical schools in the country with a total freshman population of 3,319 (Table 1). I will discuss the teaching of biochemistry in these medical schools in the context of the faculty complement, the facilities required, student preparation, and the curriculum.

FACULTY. Data supplied by the Philippine Commission on Medical Education show a total of 119 faculty members involved in the teaching of biochemistry to 3,319 medical students. Most faculty members are M.D. graduates; few are M.S. or Ph.D. degree holders (Table 2). I would say that a more balanced distribution is ideal. While there is a definite role for M.D.'s in the basic sciences, the depth of training undergone by the graduate degree holders would provide the necessary expertise for the advancement of the discipline.

Many faculty members are assigned other courses in addition to bioche-

The author is the acting chairman of the Department of Biochemistry, College of Medicine, University of the Philippines, Manila. She is also an awardee of the UP-University of Unea Professorial Chair in Biochemistry, 1984.

This article is adapted from a speech delivered during the 12th Annual Convention of the Philippine Biochemical Society.

Table 2. Distribution of biochemistry faculty according to college degrees.

Degrees	Number of Faculty
M.D. - Ph.D.	2
M.D. - M.S.	13
M.D.	83
Ph.D.	2
M.S.	14
B.S.	5*
TOTAL	119

* 3 with graduate units.

mistry (Table 3). This happens in institutions with "integrated" curricula. I suspect that this multiple assignment system is a reflection of the need for more biochemistry teachers.

Table 3. Course assignments of biochemistry faculty.

Assigned Courses	Number of Faculty
Biochemistry only	80
Biochemistry + another basic science	17
Biochemistry + a clinical subject	12
Biochemistry + 2-3 other basic science subject and/or clinical subjects	10
TOTAL	119

In the past few years, a system of cooperative teaching has evolved among basic science teachers. Cooperative teaching involves a pool of teachers from two or more schools sharing a

combined teaching load. Table 4 illustrates the system. Eleven individuals from three schools are involved in teaching biochemistry to 587 medical freshmen -- a teacher-student ratio of 1:53. Initially I had strong misgivings about this method of tackling the teaching load, but when I got acquainted with some teacher participants, I found them to be a happy, efficient, and confident group. I concluded there must be something going for them, and I shall be the last person to play the wet blanket by saying they should not go this route.

Table 4. Biochemistry "cooperative" teaching.

School	Reported Number of Faculty	No. of Students Biochemistry Class
A	9	178
B	6	59
C	6	350
Total number of participants	11*	587

* Some individuals teach in two schools.

FACILITIES. A school does not need a lot of sophisticated instruments to equip a laboratory for medical students. An analytical balance, spectrometer, table centrifuge, refrigerated centrifuge, and water baths should not be too difficult to obtain. I have no hard data on the adequacy of laboratory facilities in other departments of biochemistry. Taking our department as typical of "older" laboratories, I can imagine the envy many schools feel for younger medical schools with state-of-the-art equipment.

STUDENTS. Bioenergetics, energy metabolism, genetics, and molecular biology are regular topics in high school science and biology. The same topics

are taken in undergraduate physiology, zoology, botany, genetics, and biochemistry.

It was in 1983 that our staff discovered that 112 of the 144 freshman medicine students had taken up undergraduate biochemistry. We decided to shift emphasis from a general course to an applied program. We have not regretted our decision yet.

We should remove the notion that only a small fraction of any class has the ability or motivation to acquire insights into a natural science. It is true that few of our students will become original investigators but almost all our students will become physicians and will make decisions involving the health and lives of human beings. Biochemistry has become an important tool for making these decisions.

CURRICULUM. In their 1968 conference on medical education, the Association of Philippine Medical Colleges (APMC) recommended that biochemistry be allotted 270-300 hours in the medical curriculum. A comparison of hours between 1975 and 1985 (Table 5) shows how successfully departments of biochemistry have lobbied for more laboratory hours. Many department chairmen explain that much of the laboratory time is spent in non-laboratory activities like case discussions, journal reports, and problem-solving, aside from the usual discussions before and after a laboratory experiment. Classes are divided into groups of 20-30 students.

Table 5. Curricular hours for biochemistry in Philippine medical schools.

Activity	Number of Hours	
	1975	1985
Lecture	45 - 136	64 - 124
Laboratory	102 - 227	160 - 360
Total curricula hours	204 - 288	224 - 480

Lecture hours are devoted to a list of topics common to most schools.

- Chemistry of carbohydrates, proteins, lipids, nucleic acids, and porphyrins
- Enzymes
- Introduction to metabolism/bioenergetics
- Metabolism of carbohydrates, lipids, amino acids, purines, and pyrimidines
- Molecular genetics
- Nutrition
- Special topics:
 - Blood (plasma proteins, hemoglobin, coagulation)
 - Immunochemistry
 - Acid-base balance, fluids, and electrolytes
- Membranes
- Hormones
- Specialized fluids/tissues

Some schools like EAC synchronize topics with other basic sciences. For example, while the kidneys are being discussed in physiology, electrolytes and fluids may be discussed in biochemistry. In at least one school, IHS of Tacloban, biochemistry is not taught as a separate course but is integrated into other courses. For example, while physical diagnosis is being taught, the biochemical nature of the disease is discussed.

I think this variation is good. I doubt if there is really an ideal sequence of topics, or if there is a perfect way to teach the course. After all, we are all striving to provide a meaningful learning experience for our students, but "meaning" comes in the context of common experiences between the teacher and the students.

In the past, biochemists were harangued by other medical educators about the relevance of biochemistry to the practice of medicine. Today, such questions are no longer raised. The relevance of biochemistry to all

aspects of the life sciences is so well established that to question it would be the height of heresy! Still, this should not lull us biochemistry educators into complacency. From time to time, we should question our approach to the subject matter, course content, and strategies. We should also examine how we rate our curricula.

Is it enough that students retain much information in their short-term memories? Or should we strive to make our students acquire the ability to use biochemical information, techniques, and thought in subsequent courses or in independent work in medicine?

I think you know the answer.

ON BEING A GRADUATE STUDENT

Ramonesa R. Ricardo

There are many reasons for going into graduate school. Some are discussed here. Also discussed is the curriculum on M.S. Biochemistry offered by the Department of Biochemistry and Molecular Biology, University of the Philippines, College of Medicine, Manila.

"They say a road goes somewhere. It is not so. It is we who make the move. The road stops when we stop. It only carries us to where we want to go." I forgot now where I heard these words. I think it was a late night showing of *The Twilight Zone*, when all was quiet except for the television set and I was half-listening to it and half-thinking of what I had been doing with my life for the past two years, and why.

Two years ago, I enrolled in the M.S. Biochemistry program of the Department of Biochemistry and Molecular Biology of the College of Medicine, University of the Philippines. My reasons then were practical. Proud as I was of my alma mater, I had been hearing that UP was something else. I had been at a UP unit some years back, but had been at the other end of the red pen and outside the teacher's

record book. I wanted to find out how it was on the other side. UP Manila was in my favor, distance-wise, because I would be commuting everyday; and its tuition fees were affordable, as the only scholarship I could get was that which my husband financed. While I could have gone somewhere else with a Bachelor's degree in chemistry, I convinced myself that the trend, even in industry, was along the life sciences. Besides, I had been interested in biochemistry ever since I could remember.

My warehouse of self-confidence was not fully stocked at the beginning. Not after four kids and five years of

The author holds a B.S. degree in Chemistry from the University of San Carlos at Cebu. She taught in the University of San Carlos, Central Mindanao State University at Bukidnon, and UP at Cebu. She is currently a full-time graduate student.