

Department of Microbiology and Molecular Genetics

Prepared by the Department Assessment Committee
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Degree Program(s) Assessed	Assessment Methods	Number of Individuals Assessed
B.S., Microbiology (G. John)	Exit Interviews Grades in Core Courses Alumni Survey	14 114 57
B.S., Cell and Molecular Biology (R Prade)	Graduate Record Exam GRE B22 Alumni Survey Grades in BIOL 3024, CLML3014 and 4113 Exit Interviews	0 15 32 4
B.S., Medical Technology (DK Burnham)	Grades in Core Courses Grades in Clinical Courses Acceptance Rate for Internship ASCP Exam	7 1 3/6 1
M.S. and Ph.D., Graduate Program in Microbiology/Cell and Molecular Biology (DK Burnham)	Annual Scholarly Report (survey of faculty and students for student achievements) Exit interview	15 3

I. B.S. in Microbiology

Analysis and Findings

1. A total of 14 seniors participated in the exit interview. The main emphasis of the exit interview for graduating seniors was to ask questions related to 1.) the courses (lecture and laboratory) in the department, 2.) the faculty members in the department, 3.) the advisor for the department, 4.) the strengths and weaknesses of the department, and 5.) their preparedness for a career in microbiology.
 - The seniors were generally satisfied with all the lecture and laboratory courses, except for the Cell and Molecular Biology course.
 - The seniors felt all faculty members were very approachable, and overall very satisfactory.
 - The seniors felt the advisor was very helpful, but more explanation regarding degree requirements and career options would be helpful.
 - The seniors felt the primary strength of the department was the faculty dedication to students, laboratories, diversity of material taught, and teaching effort.
 - The seniors felt the primary weakness of the department was unavailability of desired courses at preferred periods, old laboratory equipment, and lack of more diverse microbiology courses to select from.
 - The seniors felt they are well prepared to pursue a career in microbiology.

The exit interview also provided information regarding the future plans of the graduating seniors. Most of the seniors were planning on attending professional school (i.e. Medical, Nursing) and the remaining were interested in graduate school, laboratory technician position, or a career related to health or the environment.

The results of the exit interview support the goals of the department, which are to prepare students, using faculty members who maintain a high standard of teaching and student involvement, for careers related to health and the environmental, as well as biotechnology.

2.) Institutional Research provided grade distribution for Microbiology majors in academic year 2002-2003. Students are enrolling at appropriate times within their curriculum and succeeding at a reasonable rate in Departmental courses. The problem area for 2002 and 2003 is in BIOL 3024 (General Genetics), which also shows up as a problem in grade distributions for other majors within our department. No improvements in BIOL 3024 for 2004. MICRO 3224 and 4214 showed some improvement (above average rating).

<u>Semester</u>	<u>Course#</u>	<u>Class</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>F</u>	<u>W</u>	
Fall '02	BIOL 3024	Jr.				1		1	
		Sr.			3	1		1	
	MICRO 3224	Jr.	1	4				1	
		Sr.	2	3	1				
	MICRO 4214	Jr.	1	3					
		Sr.	1		3				
Spring '03	BIOL 3024	Jr.		2		1	2	1	
		Sr.	1		4	1	1	1	
	MICRO 3224	Jr.	3	1	2	1	1	1	
		Sr.	2					1	
	Fall '04	BIOL 3024	Jr.		1	1			
			Sr.	2	2	6	1		
MICRO 3224		Jr.	2	4		1			
		Sr.		3	1				
MICRO 4214	Jr.			1					
	Sr.	5	6	2					
Spring '04	BIOL 3024	Jr.		2	1		2	1	
		Sr.	1	1	1	1		1	
	MICRO 3224	Jr.	4	1	2				
		Sr.	3	1		1			

2. Alumni Survey- The survey was sent to 57 students from all majors in the department and 15 responded (26% response rate): 1 General Services (clerical), 1 Law/Attorney, 1 Administration/Business, 1 Technology/Technical, 4 (30%) Medical/HealthCare/Lab Tech., 4(30%) Microbiologist, 1 Academic Research.

Over half the alumni respondents are employed in professional positions related to the major in which they graduated – Microbiology degree.

Uses of Assessment Results

The department has formed a committee to reorganize the Cell and Molecular Biology course. The committee decided to establish both an Introductory Cell and Molecular Biology course and an Advanced Cell and Molecular Biology course, similar to the current microbiology courses.

II. B.S. in Cell and Molecular Biology

Analysis and Findings

Six students graduated in Cell and Molecular Biology in the 2003-2004 year. Four students graduated in the Fall of 2003, two in Spring 2004 and no students graduated in the Summer of 2003.

Graduate Record Exams GRE B22

No students took the GRE B22

Alumni Survey

The survey was sent to 57 students and 15 responded (26% response rate)

- 1 General Services (Clerical etc)
- 1 Law/Attorney
- 1 Administrative/Business

1 Technology/Technical/Manufacturing
4 (30%) Medical/Health Care/Lab Tech
4 (30%) Microbiologist
1 Academic/Research

Over half the respondents are employed in professional positions related to the major they graduated from the Microbiology Department. Four respondents occupy positions of microbiologist and four are engaged in Medical technology related activities.

Grade Surveys

BIOL 3024 General Genetics

Fall 2003

Juniors - None enrolled
Seniors - 1A

Spring 2004

Juniors - 1A, 3B, 1C
Seniors - 1A, 1C, 2D

CLML 3014 Cell & Molecular Biology

Summer 2003

Junior - 1A, 1B
Senior - None enrolled

Fall 2003

Juniors - 4A, 1B, 1D
Seniors - 2A

Spring 2004

Juniors - 1B
Seniors - 1W

CLML 4113 Advanced Cell & Molecular Biology

Spring 2004

Juniors - 1B
Seniors - 3A, 5B, 1C

The grade survey data are from OSU Institutional Research Office

Exit Interview

Four exit interviews are available.

- One respondent's immediate goal was to attend Graduate school at OSU and two others to enter Medical School.
- All four respondents indicated to be satisfied with the quality of the courses offered in the Department.
- Favorite courses listed on record are; Pathogenic Microbiology and Advanced Cell and Molecular Biology.

Uses of Assessment Results

- Students have complained about the lack of identity (specialization) of the cell and Molecular Biology degree program.

In response we made several changes as follows:

- We created new courses that are focused on eukaryotic molecular biology, which includes many of the health, related professions.

New courses that have been implemented are:

- CLML 4113 Advanced Cell & Molecular Biology - This course is currently being offered,

- CLML 6304 Eukaryotic Genetics - This course will be offered in Spring 2005,
- CLML XXXX Medical Genetics – This course is under development.
- Improved the quality of the program by modifying the degree requirements as follows:
 - Increase in the number of core courses directly relevant to the field of specialization,
 - Decrease in the number of elective hours.

In the future we plan to offer specializations within the majors such as: Bioinformatics and Molecular Genetics.

III. B.S. in Medical Technology

Analysis and Findings

The number of Medical Technology major doubled this year (from ten for the time of the 02/'03 assessment to twenty now). This signifies success in the recruitment of majors partly at least, through a poster display and through a presentation of one of our internship directors in the OSU Health Careers class. This also means that the some of the previous years' data was based on fewer students, particularly with regard to grades in core courses.

Seven Medical Technology students were enrolled in core courses BIOL 3024 (Genetics) and MICR 3254 (Immunology) during the '03/'04 academic year (only two in the previous year). For the Fall '03 semester these students earned a C and an B in BIOL 3024. For the Spring of '04 in BIOL 3204, one student earned a B, one student earned a C, one failed the course and one withdrew. For MICR 3254, one student earned an A, one student earned a B and five students earned a C. The overall average of Medical Technology students in core courses for the '03/'04 academic year was 2.25. These data represent a cause for concern especially since most students with less than a 2.5 GPA in core courses are not accepted into internships. The GPA for the previous year was based on only two students so a comparison is not merited.

No students graduated in Medical Technology in the 2003-2004 year. However, one student graduated at the end of the previous year (August of 2003). Therefore, this student was analyzed for internship (clinical course) grades and performance on the ASCP certification exam. In the current academic year ('03/'04) 3 students were accepted into hospital internship programs out of a pool of 6 students who applied. Therefore the rate of acceptance was 50%. This acceptance rate was identical to that observed in '02/'03 (3/6).

Clinical course grades for the one student who performed the '03/'04 internship were as follows: Clinical Microbiology - B; Clinical Chemistry - A; Clinical Chemistry II - A; Clinical Hematology - A; Clinical Immunology - B; Topics in Medical Technology - A for an overall internship GPA of 3.6. This compares to an average internship course GPA for three students the previous year ('02/'03) of 3.8.

ASCP Exam performance for the one student intern, August, 2003 were as follows: **Score of intern = 621, National mean score = 498, Minimum passing score = 400. Our intern scored approximately one standard deviation above the national mean.** Unfortunately, scores for individual subject areas are not available since this student did not allow the release of this information. Still, these test results confirm those of previous experience that none of our OSU students have failed this exam within the past 11 years and they commonly score very well. The average score achieved by our students the previous year was 489 (August '02) compared to 621 for August '03. However, because so few students are involved, it is impossible to determine if this signifies a true upward trend.

Uses of Assessment Results

No OSU student has failed the ASCP exam in the last 11 years of the program even though the fail rate in Oklahoma as a whole is around 33%. This suggests that our students who gain entry into the internship do very well in this setting and are very well prepared for the certification exam by their coursework in residence at OSU and during the hospital internship. The other good news is that the number of Medical Technology majors doubled during the past year (from ten to twenty). However, many of our students struggle in core courses taken in residence prior to the internship and are not accepted into the internship because of this. Therefore, one of the major goals of discussing these results among our faculty will be to determine whether

anything might be done to improve the performance of Medical Technology majors in core classes and consequently their rate of acceptance into internships.

IV. M.S. and Ph.D. in Microbiology, Cell and Molecular Biology

Analysis and Findings

The following data was gathered in a survey of faculty and their students in the Annual Scholarly Report for the '03/'04 academic year:

- 7 publications (8 in '02/'03)
- 5 manuscripts (8 in '02/'03)
- 1 theses (2 in '02/'03)
- 0 dissertations (0 in '02/'03)
- 11 presentations (15 in '02/'03)
- 4 awards/fellowships/other (4 in '02/'03)

Publications, manuscript submissions, and completed theses/dissertations reflect the achievements of student research and serve as landmarks in the development of each student's scientific career. MS and PhD students are expected to publish at least one and two papers, respectively, during their studies in the program. Presentations and thesis/dissertation defenses allow students to demonstrate their ability to understand and discuss scientific research. Publications and presentations in the national forum indicate the program is competitive with other programs at comparable universities. However, the lack of student fellowships and the low stipends for student support have hampered efforts to attract better students to the program.

Comparing '03/'04 data with those of '02/'03 suggests little change in publications, submissions, presentations, theses and awards since the '03/'04 data was based on reporting on 15 graduate students as compared to 20 in '02/'03.

Exit Interviews indicated that those students receiving graduate degrees in our department are finding either further schooling or occupations in related fields. Out of three students, one obtained a post-doctoral fellowship after graduation, one found a job in a related field and one was still looking at both educational and employment opportunities. All three of these students stated that they had been well prepared for future education/employment through their experiences as graduate students. One student suggested that mentoring of new students could be improved. This will be improved in the coming year, in part, because of the creation of a graduate student lounge where students can mentor each other. The need for more graduate courses was also expressed by one student.

Uses of Assessment Results

Previous assessments indicated a shortage of graduate level course offerings and this still seems to be the case per the comments received on one of the exit interviews. This issue will continue to be addressed by the goal of offering at least two graduate level courses each semester. Current assessments results will be provided to all faculty members as part of the Annual Scholarly Report and discussions regarding potential changes will follow. Some of the future goals of the program will be to increase student stipends and other financial support through the university and research grants, increase student productivity, and research competitiveness at the national level. In addition, possible ways to improve the mentoring of new graduate students will be discussed.