

DEPARTMENT OF MICROBIOLOGY AND MOLECULAR GENETICS

Mission

The Department of Microbiology and Molecular Genetics conducts research, promotes scholarship, and provides undergraduate and graduate education in Microbiology, Cell and Molecular Biology, and Medical Technology.

Vision

The Department of Microbiology and Molecular Genetics will work diligently to maintain and foster greater national and international recognition for our research and teaching in microbial ecology, genome-based processes, and mechanisms of pathogenesis.

Core Values

Excellence – We seek excellence in all our endeavors, and we are committed to continuous improvement.

Intellectual Freedom – We believe in ethical and scholarly questioning in an environment that respects the rights of all to freely pursue knowledge.

Integrity – We are committed to the principles of truth and honesty, and we will be equitable, ethical, and professional.

Service – We believe that serving others is a noble and worthy endeavor.

Diversity – We respect others and value diversity of opinions, freedom of expression, and other ethnic and cultural backgrounds.

Stewardship of Resources – We are dedicated to the efficient and effective use of resources. We accept the responsibility of the public's trust and are accountable for our actions.

Goals, Critical Success Factors, Objectives, and Strategies

Goal 1: Recruit and retain outstanding undergraduate and graduate students from diverse backgrounds.

Critical Success Factors:

- Maintain a population of at least 100 undergraduate students majoring in Microbiology, Cell and Molecular Biology and/or Medical Technology.
- Undergraduate students majoring in the department will achieve an average GPA of 3.0 overall and at least a 2.75 in upper division courses.
- 90% of the undergraduate students will take a course in professional development and career options.
- 30% of the undergraduate students will be involved in research before they graduate.
- Provide an advising system for premedical students which results in placement rates higher than the national average.
- 30% increase in graduate student population by 2009.
- 80% of third year graduate students present research projects at local, regional, or national meetings.

Objectives:

Objective 1.1: Enhance recruitment of microbiology, cell and molecular biology, and medical technology majors.

Strategies:

- Provide attractive, informative, and easy-to-access web site descriptions of undergraduate degree programs and departmental information.
- Maintain contact with OSU High School and College Relations and freshman advisors on campus.
- Participate in OSU recruiting events and programs.
- Contact high school students taking ACT/SAT exams who express interest in our majors.
- Utilize our best teachers in BIOL 1114, MICR 2125, and CLML 3014.

Objective 1.2: Promote undergraduate student diversity.

Strategies:

- Provide an environment of understanding that embraces all cultures and backgrounds.
- Promote fellowships and other opportunities available to students of all backgrounds.
- Maintain a diverse faculty and staff to promote comfort and success in a diverse student group.

- Participate in mentoring programs for students, especially specific programs for under-represented groups.

Objective 1.3: Increase undergraduate student retention and academic achievement.

Strategies:

- Educate freshman advisors in Arts and Sciences Student Services about the curriculum requirements and course sequencing.
- Encourage qualified students to declare their major early in their academic program.
- Provide high quality undergraduate advising for majors in the department.
- Encourage instructional methodologies to maximize student performance in BIOL 1114, MICR 2125, and CLML 3014.
- Conduct an annual assessment of undergraduate programs as outlined in the departmental assessment plan, including achievement and satisfaction measures.
- Foster an active and visible Microbiology club.
- Encourage undergraduate research involvement through MICR/CLML 4990.
- Encourage professional development and career awareness through MICR/CLML 4001.

Objective 1.4: Maintain a successful and nationally visible Premedical program.

Strategies:

- Create a Health Professions advising center.
- Provide funds for travel and professional development to encourage advisor participation in the National Association of the Advisors for the Health Professions (NAAHP) and the equivalent organization for the region (SAAHP).

Objective 1.5: Enhance recruitment of graduate students.

Strategies:

- Provide attractive, informative, and easy-to-access web site descriptions of graduate degree programs and departmental information.
- Increase the recruiting activities and recruitment budget.
- Participate in OSU recruiting events and programs, and coordinate recruiting efforts with the Graduate School.
- Enhance contacts with applicants.
- Increase the number of graduate teaching assistantships with more competitive stipends.
- Utilize the Gula Fellowship to attract outstanding applicants.
- Continue seminar visits by faculty members to smaller colleges and universities in Oklahoma and surrounding states.

Objective 1.6: Increase graduate student retention and performance.

Strategies:

- Enhance communication of faculty with new graduate students.
- Provide mentoring and advising of new graduate students by faculty and senior graduate students.
- Promote graduate student participation at local, regional, and national meetings.
- Promote graduate student participation in departmental or interdepartmental journal clubs.
- Reward outstanding graduate students with the Grula Fellowship.
- Nominate outstanding graduate students for local, regional, or national fellowships and awards.
- Encourage frequent thesis and dissertation committee meetings to provide guidance on research projects.

Goal 2: Enhance quality and quantity of departmental research in microbial ecology, genome-based processes, and mechanisms of pathogenesis.

Critical Success Factors:

- Achieve national recognition of collaborative research.
- Achieve an average of 1.75 scientific publications/faculty/year by 2007.
- 70% of faculty externally funded for research by 2009.
- Average 1.75 proposals/faculty/year submitted to external funding agencies.
- 30% increase in the number of graduate students and post-doctoral fellows in the department by 2008.
- 20% of the faculty in the department engaged in collaborative research projects with faculty in other department at OSU or another university by 2006.
- 50% of faculty reviewing journal articles or grant applications by 2007.

Objectives:

Objective 2.1: Enhance the number of peer-reviewed publications in microbial ecology, genome-based processes, and mechanisms of pathogenesis.

Strategies:

- Publish 1.75 publications/faculty/year in peer-reviewed journals.
- Seek funding by 2006 for procuring major analytical tools for high quality research in microbial ecology, genome-based processes, and mechanisms of pathogenesis.
- Stimulate and support interdisciplinary approaches in research and global perspectives.
- Strive to create an academic and intellectual climate that values creativity and professional potential in each graduate student.
- Seek additional funds for invited seminar speakers, increased conference attendance, enhanced publications.
- 25% of faculty attending 1 to 2 regional, national, and/or international meetings per year by 2007.

Objective 2.2: Enhance external funding.

Strategies:

- Seek internal funding to facilitate 3 faculty members/year to meet with other researchers and program directors of national funding agencies.
- Reward faculty involved in expanding funded research programs by contribution to travel funding of his/her graduate students to attend conferences where they are presenting papers.
- Develop flexible strategies to balance workloads in a manner that will recognize differences in availability of funding opportunities.

- Encourage each faculty to register with relevant funding agencies for e-mail alerting services for new funding opportunities.

Objective 2.3: Enhance recognition of departmental faculty.

Strategies:

- Encourage faculty to present invited talks or chair sessions at national meetings.
- Encourage faculty to serve on editorial boards of scientific journals.
- Provide funding to attend national meetings where faculty are presenting papers.
- Encourage faculty to review journal articles or grants.
- Update faculty web pages annually.

Objective 2.4: Enhance and retain increased number of graduate students and attract competitive post-doctoral fellows.

Strategies:

- Seek to maintain a minimum of 2 graduate students, technicians, and/or post-doctoral fellows in each lab by 2006.
- Seek support for graduate students, technicians, and/or post-doctoral fellows through grants.
- Encourage graduate students or postdoctoral research fellows to attend at least one national or international meeting to present research papers.
- Seek out and promote internship opportunities for students with industry and non-profit employers.
- Encourage enhanced mentoring of MICR and CLML 4990 students by current graduate students.
- Improve faculty mentoring of graduate students as measured by publications and/or presentations at conferences.
- Establish policies and procedures for improving and assessing departmental graduate program: Form a departmental steering committee by 2005.

Goal 3: Increase diversity in the faculty, staff, and student body of the department.

Critical Success Factors:

- Maintain 30% of faculty positions from under-represented groups and diverse backgrounds by 2009.
- Maintain 25% of staff members from under-represented groups and diverse backgrounds by 2009.
- 20% of undergraduates from under-represented groups and diverse backgrounds by 2009.
- 40% of graduates from under-represented groups and diverse backgrounds by 2009.
- Maintain resources for the recruitment and retention of under-represented groups and diverse backgrounds.
- Maintain mentoring and professional development programs for faculty and staff members in under-represented groups and diverse backgrounds.

Objectives:

Objective 3.1: Expand the departmental instructional budget to allow additional tenure-track faculty.

Strategies:

- Increase the number of new courses.
- Increase the number of graduate teaching assistantships.
- Lobby for additional lecture and laboratory teaching classrooms.

Objective 3.2: Ensure that tenured faculty mentor junior faculty in the areas of teaching, research and service.

Strategies:

- Submit an annual report to departmental head.
- Review research proposals prior to submission.
- Review research articles prior to submission.

Objective 3.3: Project a positive and strong image of diversity through publicizing the accomplishments of under-represented groups and diverse backgrounds.

Strategies:

- Publish in the College of Arts & Science newsletter.
- Publish in the OSU Magazine.
- Publish in the regional and national minority magazines and websites.

Objective 3.4: Promote faculty of diverse backgrounds as role models for students and the community at large.

Strategies:

- Provide funds for travel and/or allowances.
- Participate in local high school recruitment activities.
- Participate in campus recruitment activities.

Objective 3.5: Promote undergraduate and graduate student diversity.

Strategies:

- Provide an environment of understanding that embraces all cultures and backgrounds.
- Promote fellowships and other opportunities available to students of all backgrounds.
- Maintain a diverse faculty and staff to promote comfort and success in a diverse student group.
- Participate in mentoring programs for students, especially specific programs for under-represented groups.

Goal 4: Collaborate in strategic alliances with other academic, government, community, corporate, and private entities.

Critical Success Factors:

- 30% of the departmental faculty engaged in a collaborative type research with faculty of other departments at OSU or other universities, industry, and national laboratories.
- 20% of faculty participating in outreach programs in science education with area K-12 schools.
- 30% increase in graduate student population by 2009.
- Submit 1 departmental collaborative grant proposal/year by 2005.
- Achieve an average of 1.75 scientific publications/faculty/year by 2007.
- Enhance departmental research focus groups: Microbial ecology, genome-based processes, and mechanisms of pathogenesis.

Objectives:

Objective 4.1: Enhance and foster multidisciplinary research.

Strategies:

- Submit large grants involving scientists from different departments with a broad research theme at least once in 3 years.
- Develop a cooperative seminar and journal clubs with faculty and students in other related departments.
- Develop a team that will allow the submission of an IGERT grant application to NSF.

Objective 4.2: Enhance partnerships with universities, industry, and government labs.

Strategies:

- Promote collaborative research with scientists from other universities.
- Promote student internships or summer jobs with industries or other labs.
- Enhanced faculty participation in Big 12 research program to visit other Big 12 labs.
- Submit collaborative research proposals with others.
- Invite seminar speakers from industry or government labs.

Objective 4.3: Improve interactions with local high schools and colleges.

Strategies:

- Establish summer workshop for area high school or community college students.
- Provide outreach with area K-12 by giving a presentation in their classes.
- Offer tours of the department to area high school biology classes.

Goal 5: Enhance the working and learning environments within the department.

Critical Success Factors:

- 10% increase in the number of tenured and tenure-track faculty in the department's research specialty areas: microbial ecology, genome-based processes, and mechanisms of pathogenesis by Fall 2009.
- 90% retention rate of tenured and tenure-track faculty at all ranks.
- 90% retention rate of permanent staff members in all departmental activities.
- 2 teaching laboratories renovated including multimedia instructional technology.
- Increase recognition of outstanding faculty and staff.
- 80% of BS and MS graduates pursuing post-baccalaureate education or careers related to their major.
- 90% of PhD students placed in postdoctoral positions nationally and internationally.
- Data from 85% of completed masters' theses and PhD dissertations published in scientific journals.

Objectives:

Objective 5.1: Hire and retain excellent faculty.

Strategies:

- Lobby for an additional tenure-track faculty position in the area of homeland defense/sensors to augment our research specialty area of "mechanisms of pathogenesis".
- Utilize all personal contacts of faculty to identify and invite applications from outstanding candidates, when positions become available.
- Advertise in the most appropriate journals internationally for candidates, when positions become available.
- Offer starting salaries at or above the national average of microbiologists at peer institutions for hiring rank.
- Identify and offer start-up packages and laboratory space at a competitive level nationally.
- Lobby for all faculty salaries at or above the average for peer institutions.

Objective 5.2: Hire and retain quality staff.

Strategies:

- Review all permanent staff positions to ensure that they are at the highest appropriate title and pay grade.
- Lobby for salaries for all staff positions both permanent and soft-money at or above the regional average for similar positions in higher education and industry.

Objective 5.3: Enhance the physical working and learning environment.

Strategies:

- Provide a graduate student lounge.
- Provide a faculty/staff lounge/conference room.
- Develop materials to be housed in the conference room to facilitate discussion and research.
- Apply for funds from the classroom fee fund to upgrade all teaching laboratories to a “state-of-the-art” level.

Objective 5.4: Provide high-quality instruction in service courses.

Strategies:

- Upgrade teaching laboratories to provide information technology facilities for teaching faculty.
- Place the best teachers in introductory courses.
- Survey all departments that include Introductory Microbiology (MICR 2125) to determine their needs and how the course might be modified to better meet the needs of their students.
- Develop a non-laboratory, upper-division general education course on the theme of “Microbes: Friend or Foe?”
- Discuss with OSU Tulsa officials ways that basic microbiology courses could be offered, and what facilities would have to be developed at OSU Tulsa to allow laboratory courses in microbiology to be offered at that campus.

Objective 5.5: Increase the depth of educational experience for undergraduate majors.

Strategies:

- Review degree sheets each year for updating.
- Survey employers in the region as to their expectations of skills that a BS in microbiology should have at the time of hiring.
- Require “Transitions in Microbiology and Cell Biology” (MICR/CLML 4001) of all majors in the junior year to provide skills necessary for the transition from the undergraduate level to job placement and/or application to graduate and professional schools.
- Insure diversity of instructional and educational materials to educate in the various sub-disciplines of microbiology and cell and molecular biology.

Objective 5.6: Enhance the quality of the graduate education program.

Strategies:

- Require publication of dissertation results of all PhD students.

- Require PhD students to present research results at national and international meetings.
- Encourage MS students to participate and present results in national and international meetings.
- All thesis-option MS students must produce a thesis of publishable quality.
- Explore the development of a non-thesis option masters degree for students who wish to acquire additional skills for technical positions.
- Explore funding for the non-thesis MS degree with regional employers.
- Survey employers in the region as to their expectations of skills that an MS in microbiology should possess at the time of hiring.
- Develop a network for identifying potential mentors and financial support for post-doctoral training of newly graduated PhDs.

Goal 6: Project a strong positive image for the Department of Microbiology and Molecular Genetics locally, regionally, and internationally.

Critical Success Factors:

- Publish annual departmental newsletter beginning January 2005.
- Achieve an average of 1.75 scientific publications/faculty/year by 2007.
- Submit 1 collaborative grant proposal per year written by departmental faculty with faculty from other OSU units or other universities.
- Sponsor an annual symposium on current topics in Microbiology starting Spring 2005.
- Provide supplemental travel funding for faculty/post-docs and senior graduate students for presentation of research findings at national meetings.
- Develop a graphic presentation of departmental activities and accomplishments that can be used as a recruitment tool by Spring 2005.
- Establish an independent panel of 3 tenured faculty to assess the quality of graduate theses and dissertations and suggest improvements by Fall 2004.

Objectives:

Objective 6.1: Increase the visibility of departmental achievements.

Strategies:

- Report findings locally in on and off campus newspapers.
- Establish a bulletin board highlighting departmental achievements by Fall 2004.
- Report achievements on the departmental web site.
- Publish an annual departmental newsletter beginning January 2005.
- Establish an annual open house and symposium beginning Spring 2005 for local residents, prospective students, current students, alumni, OSU faculty in other departments and interested faculty from other Oklahoma universities (see Objective 6.5 below).
- Visit area high schools annually to present findings and make students aware of career opportunities in Microbiology.

Objective 6.2: Increase research collaborations with faculty in other departments, OSU colleges and universities.

Strategies:

- Invite 2 faculty from other OSU departments and colleges with shared interests to present in the weekly departmental seminar each semester.
- Post circulars for seminars in other OSU departments and colleges and at OU, TU and OSU-Tulsa and the OSU College of Osteopathic Medicine weekly on the departmental bulletin board and e-mail these to all faculty and graduate students.

- Encourage faculty to write collaborative proposals with faculty in other universities through the offer of travel support for meeting with other faculty from departmental IDC funds/College of Arts and Sciences funds.
- Invite faculty with related interest in other OSU departments and colleges and at OU, TU and OSU-Tulsa and the OSU College of Osteopathic to our departmental annual symposium beginning Spring 2005.
- Develop a sound sabbatical program for our faculty and for visiting faculty by December 2004.

Objective 6.3: Sponsor local, state and regional research meetings in Stillwater.

Strategies:

- Offer to host the annual meeting of the Missouri Valley Branch of the American Society for Microbiology.
- Host the annual meeting of the Oklahoma Society for Clinical Laboratory Science Educators in November 2005.
- Seek other opportunities to host state, regional and national meetings.

Objective 6.4: Increase number (at least 1.75 research publication/faculty/year) and quality of research papers published.

Strategies:

- Establish a departmental review panel of at least 3 tenured faculty members to assess quality of theses and dissertations by Fall 2004.
- Encourage faculty to submit unsolicited review articles.
- Encourage students to read and critically analyze journal articles as part of class assignments, particularly in graduate classes.
- Hold the departmental journal club every semester and require attendance of first year graduate students.
- Encourage faculty members to publish preliminary results in short reports rather than in full papers.

Objective 6.5: Sponsor an annual symposium on current topics in microbiology starting Spring 2005.

Strategies:

- Obtain funds that could be used to both set up the symposium and bring in speakers.
- Compile a list of presenters from among faculty on the OSU campus.
- Compile a list of presenters from among faculty at local universities within the region (i.e. OK, KS, TX, AR).
- Compile a select list of presenters from throughout the US.
- Compile a list of topics that could be the subject of annual symposiums.

Objective 6.6: Increase number of presentations by faculty and staff at local, national and international meetings.

Strategies:

- Provide group transportation to faculty and students for state and nearby regional meetings.
- Identify labs that do not currently have funds available to send faculty and students to national meetings.
- Establish a procedure for applying for travel funds from the department by Fall 2004.
- Circulate information regarding national meetings throughout the department, with special emphasis on graduate students.
- Obtain funds from the college to send faculty and students to national meetings.

Objective 6.7: Develop a graphic presentation of departmental activities and accomplishments that could be used as a recruitment tool by Spring 2005.

Strategies:

- Circulate memos requesting faculty submission of most recent research accomplishments.
- Establish a committee to prepare the graphic presentation.
- Load the finished presentation on to the departmental website.
- Prepare a PowerPoint presentation and poster for recruitment at area high schools and at Oklahoma colleges.

Goal 7: Increase the effective use of technology in instruction, research and service.

Critical Success Factors:

- 2 teaching laboratories renovated including multimedia instructional technology.
- 2 portable multimedia units to deliver training in instructional materials.
- Increase by 50% online resources relating to Microbiology and Molecular Genetics courses.
- Maintain 100% access to computers for researchers, instructors, and students in research and coursework.

Objectives:

Objective 7.1: Increase effective use of technology in teaching and learning.

Strategies:

- Seek improvements of 2 teaching laboratories (LSE 316 and LSE 317) with multimedia equipment in the Life Science East Building.
- Seek 2 portable multimedia equipment sets for courses that can be enhanced by alternative modes of information transfer.
- Obtain training of 1 staff member to efficiently facilitate the use of the multimedia resources.
- Optimize availability of teaching and learning content on the Department of Microbiology and Molecular Genetics web site.
- Obtain software and support of 1 staff member to maintain and update the teaching and learning resource content of Departmental web sites.
- Update at a 20% replacement rate faculty and staff office computers per year.

Objective 7.2: Integrate the use of technology in research, publications, and services.

Strategies:

- Seek online access to a greater range of scientific resources including scientific journals and databases.
- Optimize availability of research and service content on the Department of Microbiology and Molecular Genetics web site.
- Obtain software and support of 1 staff member to maintain and update the research and service resource content of Departmental web sites.
- Increase access to computers and software in proposal preparation, data collection, and information distribution related to research activities.
- Increase and modernize research instrumentation.