

Division of Comparative Medicine

The Division of Comparative Medicine (DCM) provides animal husbandry and clinical care for all research animals on the MIT campus. Since its inception in 1974, the Division has evolved into a comprehensive laboratory animal program that provides a full range of veterinary and surgical support. Additionally, DCM has a National Institutes of Health (NIH) grant for training veterinarians for careers in biomedical research and is funded by NIH to introduce veterinary students to careers in biomedical research. The Division also has an active research program funded by numerous Research Project Grants (R01s) from NIH. Total personnel in DCM now comprises 175 individuals. The Division's administrative headquarters, along with its diagnostic and research laboratories, are located on the 8th floor of Building 16. This space is contiguous to the 8th floor of Building 56, which houses quarantine, diagnostic, and research space for DCM. The Division encompasses approximately 175,000 square feet devoted to animal research activities. The new neuroscience complex (Building 46) that opened in the autumn of 2005 contains a 57,000 gross square foot animal vivarium.

Facility Management and Animal Care

The average daily census of laboratory animals increased 2 percent during FY2006. Mice remain the primary species used by MIT investigators and represent more than 98 percent of the animal population. The animal facilities support transgenic and gene "knockout" in vivo experiments. DCM now operates two transgenic cores and performs a range of transgenic services, including in vivo embryo transfer for rederivation of mice with endemic disease that have been imported to MIT from laboratories worldwide, in vitro fertilization, genotyping of mice, and cryopreservation. It also provides genetically engineered mice to the investigative community at MIT. The animal resource program was reaccredited with laudatory comments by the Association for Assessment and Accreditation for Laboratory Animal Care (AAALAC) during the autumn of 2006.

Research Activities

Currently DCM faculty and scientific staff have 15 NIH-funded grants that support in vivo study of nitrite carcinogenesis, in vivo study of *Helicobacter hepaticus* and tumorigenesis, in vivo study of the pathogenesis of inflammatory bowel disease, in vivo study of *H. pylori* pathogenesis, in vivo study of gastric cancer, studies of heat shock protein and *H. pylori* pathogenesis, study of microflora-induced colitis, studies involving diet and *H. pylori* infection, in vivo studies investigating how CD4⁺CD25⁺ regulatory cells are able to treat colon cancer, and in vivo study of microecology of the gut and the pathogenesis of colitis. DCM was also awarded a \$700,000 National Center for Research Resources (NCRR) NIH grant for purchasing equipment for the animal facilities. Total research expenditures were \$2.9 million in FY2006.

Fiscal year 2006 was the 18th year of the Division's NIH postdoctoral training grant. There are currently eight postdoctoral trainees, one of whom is enrolled in the graduate program in the Biological Engineering Division. Thirty-two trainees have completed our postdoctoral training program, and 26 of them have passed the board examination of the American College of Laboratory Animal Medicine. An additional 10 DVMs

have completed postdoctoral fellowships sponsored by individual R01 or Program Project (P01) grants. DCM also has two MD-PhDs as postdoctoral associates and another MD who is enrolled in the Biological Engineering graduate program. Many of our former trainees hold leadership positions in academia as well as pharmaceutical and biotechnology companies. The training grant also provides short-term training opportunities for veterinary students interested in careers in comparative medicine. During FY2006, the Division had seven short-term trainees for periods ranging from four to 10 weeks.

DCM faculty and staff published five book chapters, 20 papers, and 29 abstracts in FY2006 and presented numerous research papers at national and international meetings. Dr. James Fox is the senior editor for the second edition of a four-volume series entitled *The Mouse in Biomedical Research*, which will be published in 2006.

Academic Activities

Dr. James Fox continues to serve on the NIH Scientific Advisory Council of the National Center for Research Resources and was recently appointed to the Institute for Laboratory Animal Research Council of the National Academy of Sciences. Also, Professor David Schauer and Dr. Susan Erdman serve on advisory committees for NIH. DCM faculty and staff taught two graduate subjects in the Biological Engineering Division (BE.202 and BE.450) and two undergraduate subjects (BE.106 and BE.110). Dr. Robert Marini serves as a lecturer in the Harvard-MIT Division of Health Sciences and Technology, where he is involved in the teaching of two courses.

Committee on Animal Care Activities

All students, staff, visiting scientists, and principal investigators who use animals in teaching or research must be certified by the Committee on Animal Care (CAC). To enable protocol submission and personnel training, CAC's website provides required forms, continuing education material, and information about CAC activities. In conjunction with CAC, DCM staff have developed an online training program that is combined with individual orientation and training in animal use by the veterinary staff at the Institute. Periodically, individual and group didactic training sessions for Institute personnel on topics pertaining to the care and use of laboratory animals are also offered. CAC has also developed an occupational health program for animal-related occupational health issues and periodically sponsors seminars on health issues such as zoonotic diseases. CAC continued to distribute to other institutions in the United States and abroad two instructional videos, one focusing on the role and responsibilities of institutional committees for the care and use of animals and the other on the use of anesthesia in laboratory animals. Both are available to MIT researchers at the Division or in the Hayden Science Library.

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More information about the Division of Comparative Medicine can be found at <http://web.mit.edu/comp-med/>.