

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, DCM 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 R01 grants from NIH. Total personnel in DCM now comprises 170 individuals. DCM's administrative headquarters along with its diagnostic and research laboratories are located on the eighth floor of Building 16. This space is contiguous to the eighth floor of Building 56, which houses quarantine, diagnostic, and research space for DCM. The Division now encompasses approximately 175,000 square feet devoted to animal research activities. The new neuroscience complex (Building 46), which opened in the autumn of 2005, contains a 57,000 gross square foot animal vivarium. An additional new vivarium will be constructed as part of the new Cancer Center construction project.

Facility Management and Animal Care

The average daily census of laboratory animals increased two percent during FY2007. Mice remain the primary species used by MIT investigators and represent more than 98% of DCM's 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 which 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.

Research Activities

Currently DCM faculty and scientific staff have 12 NIH-funded grants supporting in vivo study of nitrite carcinogenesis, in vivo study of *Helicobacter hepaticus* and tumorigenesis, in vivo study of pathogenesis of inflammatory bowel disease, in vivo study of *H. pylori* pathogenesis, in vivo study of gastric cancer, studies involving diet and *H. pylori* infection, study of microflora-induced colitis, study of virulence of *Escherichia coli* O157:H7 genotypes, and in vivo studies investigating CD4⁺CD25⁺ regulatory cells' ability to treat colon cancer. Total research expenditures were \$3.1M in FY2007.

FY2007 was the 19th year of the Division's NIH postdoctoral training grant. There are currently six postdoctoral trainees, one of whom is enrolled in the graduate program in the Department of Biological Engineering. Two PhD candidates in DCM were awarded their degrees in 2007. Thirty-five trainees have completed our postdoctoral training program and 27 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 grants. DCM also had this past year two MD/PhDs as postdoctoral associates and another MD who completed his PhD in the Biological Engineering 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 FY2007, DCM had seven short-term trainees for periods ranging from four to 10 weeks.

DCM faculty and staff published one four-volume book, five book chapters, 33 papers, and 30 abstracts in FY2007 and presented numerous research papers at national and international meetings. The second edition of a four-volume series, *The Mouse in Biomedical Research*, of which DCM director Dr. James Fox is the senior editor, was published in 2007.

Academic Activities

Dr. Fox recently served on the NIH Scientific Advisory Council of the National Center for Research Resources and was appointed to the Institute for Laboratory Animal Research Council of the National Academy of Sciences (NAS). He is also a member of the NAS Committee to Assess the Current and Future Workforce Needs in Veterinary Medicine. Professor David Schauer serves on an advisory committee for NIH and the new MIT interdepartmental program in microbiology. DCM faculty and staff taught two graduate subjects in the Department of Biological Engineering (20.202 and 20.450) and one undergraduate subject (20.106). 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. Dr. Susan Erdman and Dr. Arlin Rogers were both promoted to principal research scientists this past year.

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 US 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/>.