

## Department of Laboratory Animal Resources Budget Overview for 2011-12



Health Education Bldg. under construction in 1976.

### DLAR History on the Health Science Campus

**Allocated Space-** After the founding of the Medical College of Ohio at Toledo in 1964, animals were held in the Arlington Dog Kennel, the Surgery Research Laboratory, and in the basement of the William Roche Memorial Hospital. This program eventually became known as the Animal Research Facility (ARF). This department has been based in the Health Education Building (HEB) animal facility from the time of its completion in 1976. Dr. Donald Clifford, the first veterinarian director, joined MCO in 1970 and served until 1990; he was involved in the design and development of the HEB animal facility. Subsequently, under Dr. Reed Rings, the department was renamed to the Dept. of Laboratory Animal Medicine (DLAM). Dr. Brent Martin then served as director from 1998 to 2008.

Prior to the construction of the Health Education Building, animal research activities also took place in the Block Health Sciences building after its completion in 1974. Several areas there were utilized by ARF, including basement space now occupied by the Advanced Microscopy and Imaging Center. Additional small animal housing was also originally utilized on the 2nd floor of HEB, but not formally allocated to DLAM; these were accessed with a restricted elevator in the area. Until the completion of HEB, animals were also housed at other sites on the MCO property.<sup>1</sup>

Following the completion of HEB in 1976, all of the ARF-occupied spaces in Block were gradually relinquished and used for other purposes, amounting to a reduction then of 2,250 square feet in the basement area. As constructed, the space allocated to ARF in HEB totaled ~45,000 sf.; it was designed to accommodate a wide variety of species utilized in teaching and research.

In 1996, the construction of the Biosafety Level 3 Lab within DLAM appropriated 1,290 sf of facility space. Over time, several other areas (524 sf) have been relinquished by DLAM in order

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<sup>1</sup> Images of the original Medical College of Ohio animal facilities are displayed at the end of this report.

to accommodate other activities in the building, including space appropriated for Facilities & Construction and Safety & Health.

Since the construction of HEB, therefore, DLAR has experienced a net loss of ~8,000 sf of work space, resulting in 18% less space than its original footprints.

**Species utilization-** In addition to these quantitative changes in allocated space, this program has experienced changes in the nature and species emphasis of its research activities. The original floor plan of the HEB vivarium was based on the demand for significant numbers of larger animals, particularly dogs, pigs and goats, for both research and medical school education. Other species utilized included rabbits, guinea pigs, and primates. Beginning in the early 1990s the emphasis began to shift significantly away from larger animals toward small mammal models, namely laboratory mice and rats.

At the present time, the only larger species utilized are swine, and these are primarily for acute EMT training labs, rather than for chronic research studies. In all probability, this trend will only strengthen, given the powerful tools offered by genetically modified mice and rats. Dogs and primates have not been utilized here for over 6 years.

The requirements for housing specialized and sensitive strains of rodents have increased dramatically over the past 10 years at UT. Immunocompromised SCID, immunosensitive NOD mice, and stress-sensitive studies involving methamphetamine and MDMA (Ecstasy) research require dedicated spaces. Other mouse strains require special housing to reduce stress that may result in cannibalism and inefficient breeding. Special spaces are also used for circadian rhythm work involving metabolic diseases. Substantial space is dedicated to a “rat barrier” unit.

Regular, broad-based screening of all rodent colonies for disease has become an essential DLAR management activity. The increased acquisition of research rodents from other academic institutions, and the potential risks they involve, has required greatly expanded activities in animal quarantine and re-derivation programs (particularly to clean up colonies contaminated with Mouse Norovirus). Fortunately, the availability of the Wolfe Hall vivarium on the Main Campus has facilitated these important activities.

**Specialized spaces-** More and specialized research activities require not only procedural space outside of the primary housing rooms, but work spaces relevant to the health status of the animals which are to utilize them. For example, we have Mouse Norovirus positive and negative colonies. It is not appropriate that they cross-traffic the same spaces.

Another trend in animal work is the increasing number of projects which require spaces for both biosafety level 2 work, and for projects involving chemical hazards. These generally require negatively ventilated rooms and ventilated work benches. Allowing projects to operate concurrently is becoming a problem because we are running out of appropriate individual spaces. We have concluded that the use of fully hepa-filtered microisolator caging units are part of the solution for housing multiple projects in a single room, rather than dedicate

individual rooms to single projects. This equipment purchase was funded by the School of Medicine and was put into use in mid-2012.

The specialization of technical procedures, as well as more stringent animal health and housing requirements are driving the needs for modified work and housing spaces. These technologies include assessment tools such as IVIS imaging, echocardiography, NMR, actigraphy, metabolism chambers, and telemetry. There is also a significant increase in microsurgical procedures to create models for studying renal and cardiovascular diseases. In addition, zebra fish are now being used on the Health Science Campus since the relocation of pharmacy faculty.

In summary, we are running out of total space, as well as task-appropriate space. In the short term this requires that excess space formerly dedicated to larger animals be remodeled to serve contemporary needs. If additional programs are to be added and animal research faculty are to be recruited, annexation of additional space for DLAR operations will be required in the future. In the meantime, research groups are encouraged to manage their colonies as efficiently as possible, in order to maximize functional capacity.

The required space conversions involve various modifications of room configurations, plumbing, lighting systems and HVAC. We are currently at an impasse in accommodating new faculty who have more than simple housing needs. This has recently come to the fore in efforts to recruit new faculty for the departments of Microbiology and Pharmacology & Physiology. Unfortunately, renovations of animal research space are, by nature, costly.

Compounding space limitations is the lack of a funded plan to replace and add needed caging systems suitable for modern rodent research. DLAR lacks a new equipment budget plan and an equipment replacement budget. The per diem rate methodology has not historically recovered these costs, and no designated administrative appropriation is in place to meet these needs. Rather, these issues are being dealt with on an ad hoc basis. This has been discussed with HSC administrators in order to initiate at least an annual incremental approach to meeting these needs.

### **DLAR History on the Main Campus**

Following the merger of the University of Toledo and the Medical University of Toledo in 2006, DLAM assumed oversight of animal care and use activities on the Main Campus ["Animal Care Program" (ACP)]. This included the operational responsibilities for the Wolfe Hall vivarium. Upon the retirement of Dr. Brent Martin in 2008, Dr. Robinson became director, and DLAM was changed to DLAR (Department of Laboratory Animal Resources).

This merger resulted in assuming the budgetary aspects of the 9,000 sf Wolfe Hall animal facility, which was accomplished with minimal addition of personnel. A significant benefit of this additional capacity has been the ability to quarantine incoming animals from non-vendor sources, such as other academic research institutions. This has now become a vital capability for supporting research activities of HSC faculty. The downside of this arrangement is that it has stretched DLAR human and material resources.

Veterinary and advisory oversight of activities on the Main Campus principally involve animal use by the Dept. of Psychology, Health and Human Services, Biological Sciences, Bioengineering, remaining Pharmacy faculty and the Lake Erie Center. Two of these have their own animal facilities, which are managed with DLAR oversight.

One of the goals set forward following the institutional merger was the integration of animal care and use activities campus-wide. The first phase of this involved combining their respective Animal Care and Use Committees, which was accomplished in January 2010. The second phase was coordinating efforts to achieve campus-wide accreditation by AAALAC, The Association for the Assessment and Accreditation of Laboratory Animal Care. The Health Science Campus program had been continuously accredited since 1983. Campus-wide AAALAC accreditation was achieved in 2011.

As with the HSC animal facility, there is no program to replace or add capital equipment. Fortunately, the more contemporary configuration of the Wolfe vivarium has thus far required minimal remodeling. Current animal activities there are limited to rats, mice and zebra fish, although the Psychology Department has routinely used USDA regulated species in the past (e.g., primates, bats and alpacas).

**Budget History-** Following the merger of the Main Campus and Health Science Campus, DLAR was charged with managing animal facilities on both campuses. However, the specific subsidy which had been traditionally allocated to MC animal research activities was eliminated, placing the entire burden on DLAR to absorb these responsibilities without any specific ongoing budget allocation. Moreover, since the income history of the Wolfe Hall operation fell far short of providing meaningful contributions to its operations, nearly all of the cost was borne by DLAR.

This has been offset, in the interim, by several measures taken by DLAR management:

- a) Cost reductions were made in labor in Wolfe Hall;
- b) New income was generated from contracts for expanded extramural animal activities on the Health Science Campus, and
- c) Discretionary budget resources that were incrementally utilized for improvements of equipment and physical spaces in DLAR-HEB disappeared. The result of this shortfall, in combination with serial budget reductions, is the inability to deal with these resource deficits going forward.

**Current Program Trends-** The following graph displays the annual income for DLAR, as well as the subsidy provided for the operating budget.

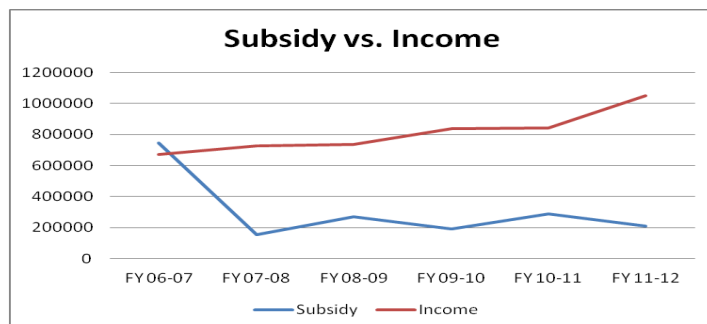


Figure 1. DLAR Subsidies and Income (\$)

Due to the budget subsidy reductions for DLAR over the past three years, this program no longer has any capacity to address equipment needs. The current approach is to seek special appropriations for all capital equipment purchases/replacements and all renovations.

Whereas the per diem rates have maintained a very flat structure for years, limited to CPI inflation adjustments, the subsidy to this program has been steadily declining. For FY 06-07, the subsidy level for DLAR–HSC was 49%, and 97.3% for DLAR-MC. For FY 07-08, the subsidy level for the combined DLAR operation was 22.6%. For FY 11-12, the subsidy level for DLAR is 16.8%. For 2012-2013 the subsidy level is 12%. In the absence of a renovation and capital equipment plan, this program is now in a static position.

This reduction in subsidy support has taken place in the face of continuing recruitments of animal using faculty, the relocation of School of Pharmacy faculty from the Main Campus to the Health Science Campus and notable increases in research activities. The workload has increased due to the greater number of research projects and number of active research personnel.

**Expense Categories-**

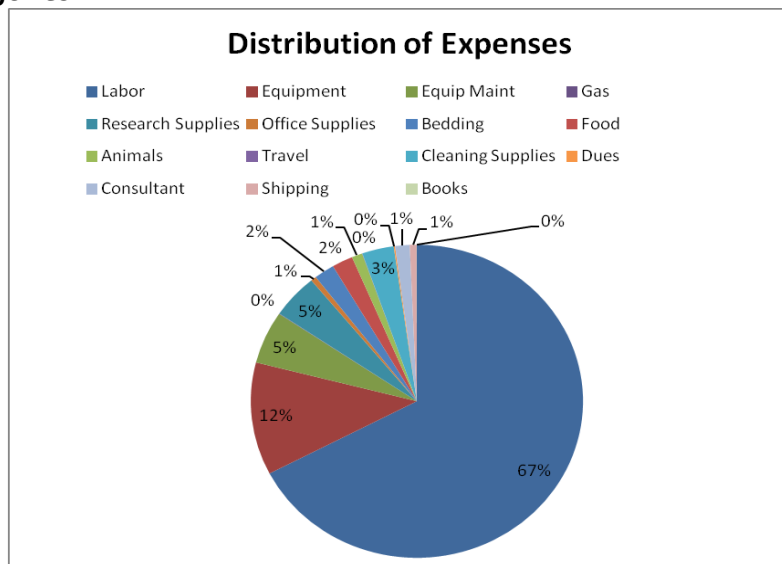


Figure 2. DLAR Expense Distribution, FY 11-12.

**Recharge Income Sources-** The animal species income breakdown, on the basis of per diems, is demonstrated in the following graph. Based on discussions with faculty, significant increases in the need to accommodate research using rats are imminent, based on grant funding expectations. We are not, however, adequately prepared with appropriate caging systems to accommodate them.

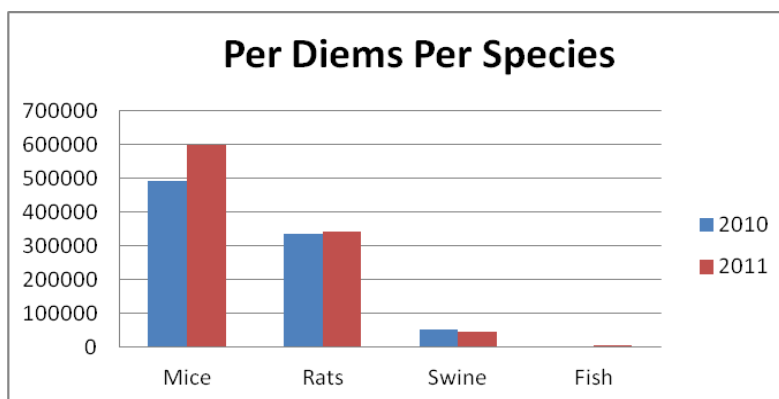


Figure 3. DLAR Income from Per Diem Recharges by Species.

The DLAR budget has been gradually increasing due to the growth of animal use activity in the University of Toledo program. The budget growth represents real growth in that, with the exception of modest adjustments for inflation, per diem rates have remained flat. Overall, DLAR recharges compare very favorably with other accredited academic research institutions, and it continues to provide a competitive environment for the recruitment of new faculty.

**Revenue Initiatives-** DLAR staff has made significant efforts to locate extramural resources to support the research program at the University.

- A CO6 grant was submitted in 2010 which proposed \$5M in renovations and equipment enhancements to the HSC animal facility.
- In addition, two separate G20 grant applications were submitted for more limited acquisitions of animal research housing and renovations.

Unfortunately, the applications were not successful in this time of hyper-competition for limited funding (2010 data indicates a low overall success rate for NIH research grant applications of 18%, and an even lower rate for facilities improvement awards).<sup>2</sup> The likelihood that additional applications at this time would bear fruit is marginal, leaving UT with the alternative of funding improvements internally. The grant submission efforts resulted in a comprehensive review of the status of the current facilities and a plan to upgrade them by remodeling, as well as by the addition of more efficient rodent housing systems. These efforts are pending the availability of funds.

DLAR management has also endeavored to find additional sources of earned income to support its overhead. In the past 4 years this additional revenue has amounted to ~\$120,000- from outside contract work and from providing additional rechargeable project services to investigators.

<sup>2</sup> Source: Science Insider, 20 January 2012.

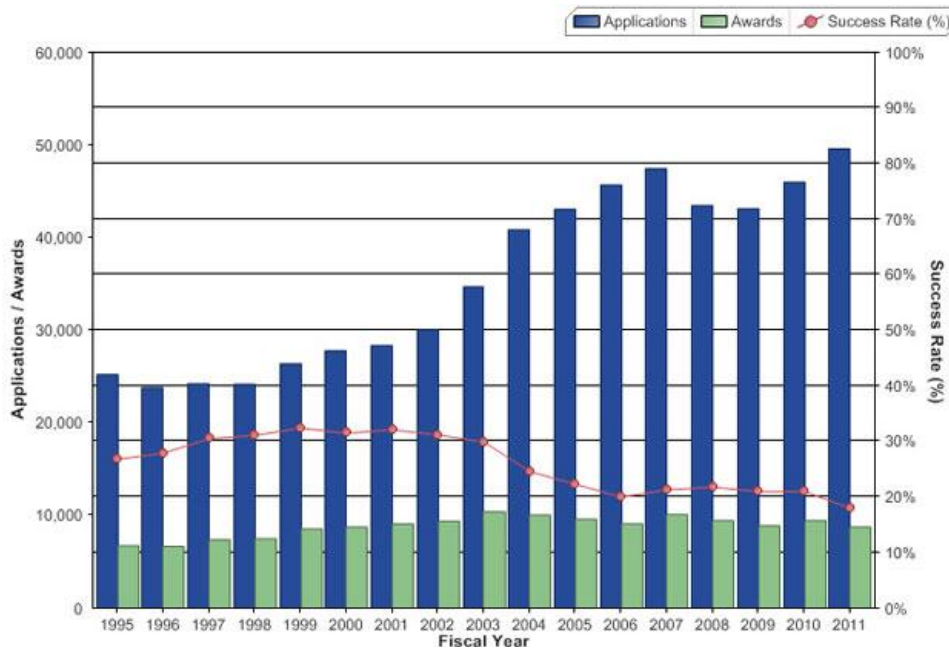


Figure 4. NIH Grant App. Success Rates (1995-2011).[Science Insider, 20 Jan. 2012]

**Measures of Animal Research Activity-** More animal related research activity is reflected in the increase in administrative activity affecting DLAR related to the IACUC process, as shown in the following graph. Despite the increased activity, staffing levels have remained static.

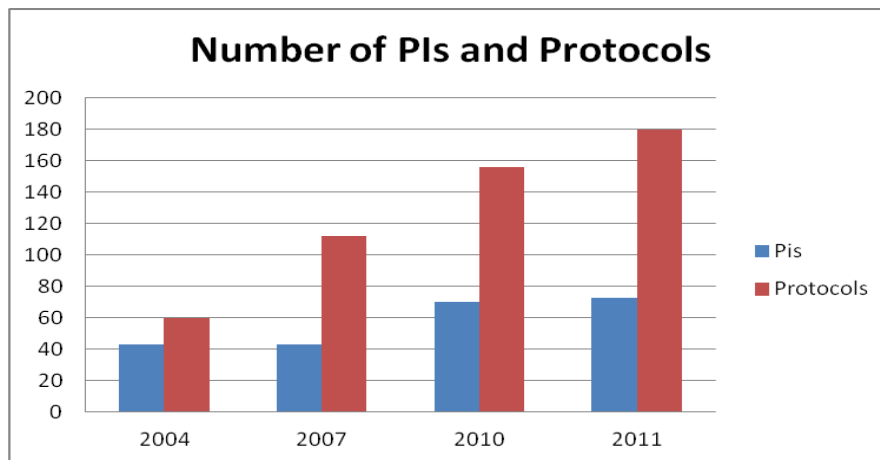


Figure 5. Changes in PI Population and Approved IACUC Protocols at UT.

With respect to workload, the above graph does not represent the large number of protocol amendments now being processed/serviced by both the IACUC and DLAR managerial staff. This is a reflection of the scope and complexity of projects underway as well as regulatory expectations. DLAR training activities have increased exponentially from pre-2008 levels.

**Cost Shifting Effects on DLAR Budgets-** Recent university purchasing and accounting program changes have transferred certain tasks directly to DLAR. Specifically, all animal purchases are now made directly by DLAR personnel,, not by University purchasing personnel. In addition, all

recharge accounts must now be tracked transaction-by-transaction by DLAR staff in order to assure that proper charges are made and credited to DLAR’s budget data. This has resulted in adding a 0.5 FTE clerical position to DLAR without any special budget appropriation.

**DLAR Staffing Continuity-** In addition to the aforementioned space and equipment issues, it is important to explore another long term matter which has the potential to affect the future of the capacity of the animal based research activities of this university. This has to do with competitiveness, personnel retention and future leadership. At the present time, there are no opportunities for advancement for line level staff in this department. Based on salary surveys conducted by the American Association for Laboratory Animal Science, UT animal care personnel are compensated approximately 20% less than the industry average.<sup>3</sup> In the absence of a slow regional economy, this program would be at risk for accelerated personnel turnover, which could not be easily remedied. It is important, therefore, that attention be given to employee retention and job satisfaction, as this relatively small labor force has a very significant effect on the quality and capability of the overall research effort at this university. The current economies of DLAR are directly related to effective intradepartmental working relationships and low turnover. The likely result of significant changes in this model will be increased operating costs.

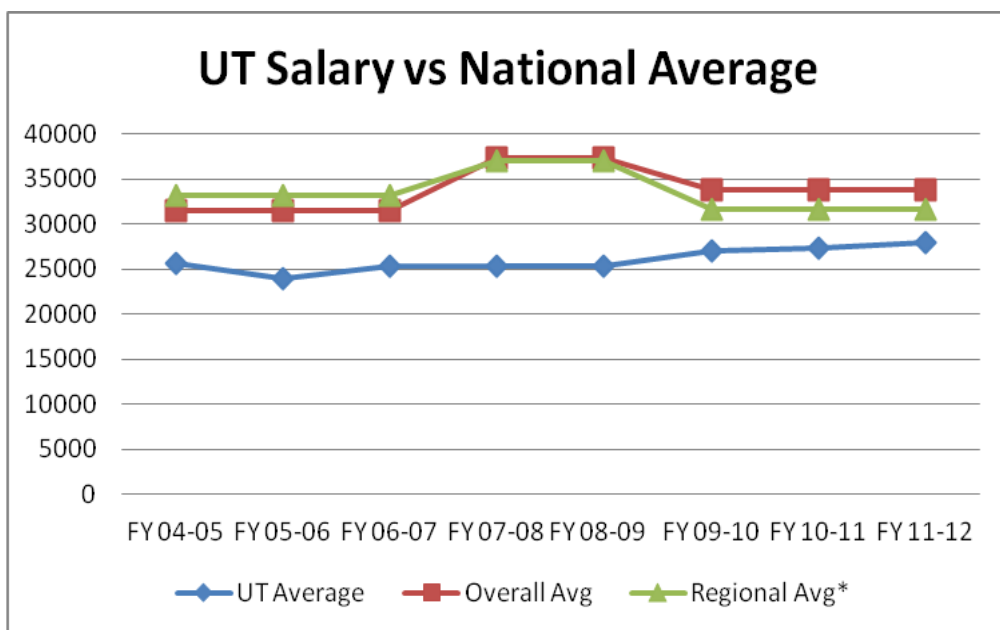


Figure 6. Husbandry Personnel Industry Compensation Comparisons.

**Regulatory Environment-** The growing compliance mandates arising from enhanced NIH requirements, such as the revised *NIH Guide for the Care and Use of Laboratory Animals*, and congressionally mandated accelerated enforcement activities with the U.S. Dept. of Agriculture’s oversight of the Animal Welfare Act, have resulted in increasing focus on the regulatory environment. One outcome is the necessity to provide greater post-procedural oversight of all animal research activities, and more seamless veterinary coverage, which mandates the availability of veterinary services 365 days per year. This program currently

<sup>3</sup> Laboratory Animal Facility Compensation Survey (AALAS, 2010).



operates with one staff veterinarian, and an on-call veterinarian to cover the absence of the regular veterinarian.

### **Summarized Recommendations**

- Determine an institutional subsidy which supports the strategic goals of UT research
- Create a funded plan for facilities renovation
- Create a funded plan for replacement and acquisition of new equipment
- Address the long-term issue of more competitive compensation for husbandry personnel
- Establish a department strategic plan which addresses the needs of the animal-based research program for the next 10 years
- Plan for the eventuality that the senior management of DLAR will turn over in the next 5-6 years.

### **Reporting:**

Vice President for Research

### **Primary Functions:**

Facilitate animal based research

- Provide animal expertise, support and training for faculty research programs
- Provide expertise on animal research techniques and issues
- Provide veterinary care, husbandry care, facilities, equipment, and management of animals involved in research, testing and teaching
- Establish standards for animal care oversight in research procedures
- Manage UT's compliance and comportment with animal research laws, regulations, accreditation organizations, and public ethics

### **Primary Internal Constituencies:**

- Faculty and researchers using animals
- Institutional Animal Care and Use Committee
- Research and Grants Administration
- Safety and Health / Institutional Biosafety Committee
- Facilities Management
- Satellite facilities with non-DLAR managed animal programs (U. Hall, HHS, LEC)
- University administration

### Primary External Constituencies:

- U.S. Department of Agriculture (USDA) - UT is a "registered" research facility subject to unannounced inspection (occurring at least annually) for compliance with the Animal Welfare Act; a legal requirement. Office of Laboratory Animal Welfare (OLAW), NIH - UT has an approved "Assurance" of compliance with the *PHS Policy on Humane Care and Use of Laboratory Animals* on file; this is legally required for UT to receive Public Health Service associated funds involving the use of animals.
- Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) - UT's animal care program has been continuously accredited since 1981; this is voluntary accrediting program with triennial on-site program re-accreditation review.
- The general public

### Resources:

Personnel - 8 FTE Animal Lab Aides on staff, plus Associate Director, Operations Mgr., On-call contract DVM, Secretary and Attending Veterinarian/Director.

#### Physical Plant

Health Science Campus ~ 37,000 gsf on basement level of Health Education Building

~ 40 animal rooms

- designed and constructed in 1970's with minimal alteration since then

Main Campus ~ 9,000 gsf in Wofe Hall vivarium

-designed and constructed in 1990 and currently >75% occupancy

### Volume of Activity:

\$13M in external (Federal) grants have a component using DLAR; additional internally funded work.

<b>Budget:</b>	<b>FY</b>	<b>10-11 Actual</b>	<b>11-12 Budgeted</b>
	<b>Total \$ Costs</b>	1,131,364	1,261,994
	<b>Income \$</b>	843,692	1,050,000
	<b>Subsidy \$</b>	287,672	211,994
	<b>Subsidy %</b>	25%	16.8%

Income is recovered from user accounts (generally external grants and contracts) via a daily charge (per diem) based on housing an animal for a day (an "animal care day") and is primarily related to cost accounting consistent with NIH grant rules. Additional income is derived from special services to investigators and special programs (EMT Training). University Budget Subsidy was 25.4% in FY 10-11 and is budgeted to be 16.86 in FY 11-12. This subsidy calculation does not account for periodic one-time university contributions for major equipment replacement in emergency situations (e.g., a \$73,000 major autoclave replacement in 2011.) As this report was being completed, \$26,000 was allocated by the School of Medicine for the purchase of requested bio-containment caging.

## Challenges:

The physical facilities supporting the animal research were designed and built for a different time and a different type of research than is conducted now. The resource cannot be used to optimal efficiency in its current configuration. The HVAC systems are dated for providing environmental conditions needed for modern research.

Meeting the increasingly specialized needs of research faculty requires a plan for sequential renovation of space in order to accommodate current and new faculty. The capacity of the facility is at its limit without reconfiguration. This is currently resulting in cost obstacles for academic departments to recruit new faculty to the Health Science Campus, potentially stifling recruitment success.

The present budget does not provide for the accumulation of funds to replace or obtain equipment, including caging systems. All significant capital equipment is obtained on an ad hoc, rather than a planned basis, and by special requests to the university administrators.

Animal research is increasing in complexity and the requirements for needed husbandry is increasing in complexity. The animal care technician compensation is in the lower tier of UT employees and in the industry. UT needs to adopt a more paraprofessional view of the animal caretaker staff and consider more industry-competitive compensation and advancement opportunities.



William. Roche Memorial Hospital; animal facility in basement.



Surgery Research Laboratory



Arlington Dog Kennels, south of Arlington Avenue