

# A program for standardized training in rodent handling at a large academic institution

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In large, decentralized institutions, providing consistent training to the substantial numbers of rodent handlers can be a challenge. The author describes a program developed at her university to provide more uniform and consistent training to personnel working with lab rodents. In this program, every Principal Investigator with an active animal use application appoints a Laboratory Animal Coordinator, who, once fully trained and certified, is responsible for coordinating animal activities in the laboratory and for training other lab workers in proper rodent handling and animal welfare rules and regulations. The program has been successfully used to train thousands of animal users at the author's university.

For an IACUC at a large academic institution, it can be difficult to keep up with all the animal use compliance details such as personnel tracking, training, laboratory inspections and post-approval monitoring. Many academic institutions, including the University of North Carolina at Chapel Hill (UNC-Chapel Hill), have decentralized animal care and use programs, with animal facilities located all across campus and even off campus. The UNC-Chapel Hill animal research community includes roughly 350 Principal Investigators (PIs), 1,400 animal handlers and 1,200 approved protocols (**Table 1**). UNC-Chapel Hill has ten animal facilities on campus as well as five off-site animal facilities. At UNC-Chapel Hill, the Office of Animal Care and Use (OACU) supports the activities of the IACUC and provides compliance oversight, application administration and hands-on training in the proper use of laboratory animals. The OACU consists of nine members (**Table 2**). The OACU and the IACUC both work closely with the Division of Laboratory Animal Medicine (DLAM), which provides husbandry and veterinary care of research animals.

Before the Laboratory Animal Coordinator (LAC) certification program was developed at UNC-Chapel Hill, training of research personnel in proper handling of rodents was informal and was done as needed. But when thousands of individuals are involved in animal

research at an institution, it may be unrealistic to expect one office or team to train, observe and certify every animal user in all the common techniques described in the animal use application. The combination of large numbers of animal handlers, diverse backgrounds of the handlers and frequent turnover of research personnel makes providing uniform animal-handling training a challenge, especially in the current economic climate of reduced resources.

The UNC-Chapel Hill OACU Director was interested in enhancing the training program to provide uniform and consistent training of all research personnel in proper rodent-handling techniques. Tackling ~1,400 individuals at once was too daunting a task. Therefore, in 2002, the OACU Director determined that UNC-Chapel Hill would benefit from a system that provided uniform rodent-handling training while extending training responsibilities to qualified individuals within the research laboratory. UNC-Chapel Hill focused on rodent-handling techniques because a large percentage of animals used at UNC-Chapel Hill are rodents, but the LAC certification program could be modified to include other species.

## LAC CERTIFICATION PROGRAM

The basic premise of the LAC certification program is that every PI with an active animal use application

**TABLE 1 | UNC-Chapel Hill animal use statistics (as of October 2009)**

Approved applications	1,200
Amendments (per year)	900
PIs	350
Animal handlers	1,400
DLAM facilities (both on and off campus)	15
PI-maintained animal housing facilities	21
Laboratories and housing areas requiring semi-annual inspection	100
Annual educational laboratory inspections	35
Annual surgical procedure observations	50

appoints a LAC, who coordinates animal activities in the laboratory and trains other lab workers to handle rodents properly. The LACs receive hands-on training in the basic rodent-handling techniques that will be used by the members of the laboratories they represent. These include all routine handling techniques and procedures that are done as part of an approved application: common injections, blood withdrawal, oral gavage, euthanasia, aseptic technique, etc. Once the LACs are trained and competent in the techniques that will be used in the laboratories they represent, they are certified to train other individuals in the laboratory. By first training and certifying a qualified LAC in each laboratory, the institution can effectively provide consistent training to all rodent users.

The concept of the LAC certification program at UNC-Chapel Hill was born in 2002 and fully implemented by 2003. It took roughly a year to identify and train LACs for ~350 PIs with active animal use applications. Since 2003, all laboratories in which research animals are used have had certified LACs (Fig. 1). The OACU is responsible for identifying new PIs when they submit animal use applications. IACUC approval of an application is contingent on the PI appointing a LAC and ensuring that the LAC receives certification in a timely manner. The OACU maintains an electronic listing of all LACs and their contact information.

At UNC-Chapel Hill, the LAC certification program is managed and operated by the OACU Training and Compliance Unit, composed of three full-time staff members (Training and Compliance Coordinators, TCCs) who have previous experience working with research animals and who have veterinary technical degrees or Master's degrees in science or animal husbandry. At UNC-Chapel Hill, the current TCCs are well-qualified animal handlers with more than 35 years of combined experience in research laboratory settings using animals. The TCCs provide the hands-on training of research personnel using rodents as well as the necessary training and certification of all LACs (Figs. 1 and 2). With the involvement of

qualified LACs in training research personnel (Fig. 3), the TCCs can focus more effectively and efficiently on other tasks: training manageable numbers of individuals in hands-on classes; providing additional one-on-one training as needed; carrying out post-approval monitoring and procedural observations to assess surgical skills; doing semi-annual inspections; and investigating compliance issues.

**LOGISTICS**

**The Laboratory Animal Coordinator (LAC)**

The LAC should be a permanent employee who will be with the laboratory on a long-term basis. A PI can serve as the LAC, but more typically the LAC is a senior research technician in the laboratory. Each PI must identify a LAC either in his or her animal use application or in an application amendment. Some laboratories have multiple PIs and only one LAC, whereas other laboratories have one PI with multiple LACs, depending on the particular needs of the PI and size of the laboratory.

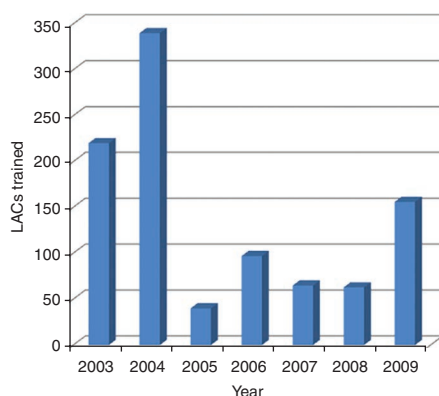
**Responsibilities of the LAC**

The LAC must attend formal training and be certified during that training to ensure that he or she is appropriately qualified and experienced in handling living animals. After the LAC is officially certified, he or she is approved to train and certify other members of the laboratory staff in the routine procedures that they carry out as part of the approved IACUC application. The LAC should be familiar with the work carried out in the laboratory that he or she represents, because he or she acts as both a point of contact for other lab members and a liaison between the laboratory and the IACUC.

**Responsibilities within the laboratory.** Although the PI is ultimately responsible for all activities carried out in the laboratory, the LAC is the 'go-to' person in the lab who ensures that all lab members who handle animals are qualified to carry out procedures in accordance with regulatory expectations. The LAC is empowered by the PI to make decisions about animal care, such as anesthesia, treatment and euthanasia, based on information described in the protocol and approved by the IACUC.

**TABLE 2 | OACU full-time personnel**

Director	1
Training and Compliance Manager	1
Training and Compliance Coordinators	2
Grant Specialist and IACUC Administrator	1
Business Services Coordinator	2
Administrative Support Specialist	2



**FIGURE 1** | Number of LACs certified by TCCs (as of 26 October 2009). In 2003 and 2004, when the program was first established at UNC-Chapel Hill, large numbers of LACs were certified. The numbers leveled off in 2005–2008. UNC-Chapel Hill recently experienced an increase in the number of mouse users, reflected in the greater number of LACs certified in 2009.

The LAC is responsible for ensuring that laboratory personnel are familiar with all aspects of the animal application in which that individual participates, including any IACUC-approved amendments to the approved application. The LAC makes all active applications, annual renewals and amendments accessible to laboratory personnel. He or she may maintain a confirmation sheet for lab personnel to sign when they have read the applications, certifying that they understand the procedures described in the application and amendments. The LAC also receives updates to animal care policy and other new information from the OACU electronically and is responsible for communicating these to other lab personnel. The LAC holds regular laboratory meetings with research personnel to review both new and established animal care policies. The LAC works with laboratory personnel to ensure maintenance of adequate experimental and animal health records, as well as documentation of the administration of anesthetics and analgesics. LACs review monitoring schedules with other laboratory personnel to ensure adequate monitoring of animals as specified in the approved IACUC applications. LACs are responsible for ensuring that all personnel in the laboratory adhere to IACUC and DLAM policies.

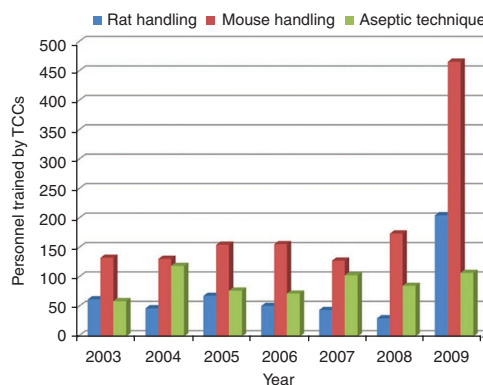
LACs also work with the TCCs to educate lab personnel in reporting animal mistreatment or application noncompliance. LACs ensure that the ‘whistle-blower’ policy is posted in a visible location in laboratories where animal work is done. They should report to OACU and veterinary services any unanticipated adverse effect occurring in experimental animals and should work with their PIs to amend applications appropriately to describe any proposed changes before they are implemented. In the event that a LAC discovers

non-compliance in his or her laboratory, he or she should inform the PI so that the laboratory can provide the IACUC with a non-compliance self report.

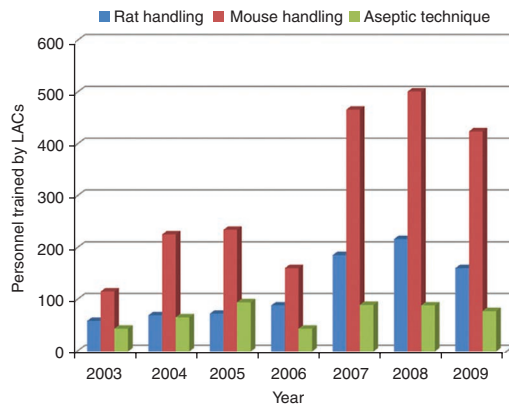
Unless the PI officially names someone other than the LAC or identifies multiple individuals in the lab, the LAC serves as the 24-hour point of contact for animal care staff. The LAC must be available after hours and on weekends and holidays to answer questions regarding the health of the PI’s animals. The LAC coordinates animal care arrangements with the veterinary services supervisor. Should the LAC be unavailable, he or she must name a replacement contact. The LAC should make certain that all current contact information is posted in the animal facility.

**Responsibilities as a liaison.** The LAC facilitates communication between the research laboratory and the IACUC, the DLAM and Environment Health and Safety personnel. The LAC is a valuable resource for the DLAM facility supervisor as he or she can review husbandry information with the research team, including proper procedures to maintain biosecurity when returning animals to the animal facility, building access policies and animal transport policies.

Having one designated IACUC liaison in every laboratory means that the IACUC always knows whom to contact regarding animal concerns, questions or other issues. The LAC serves as the liaison between the lab and the IACUC for situations including semi-annual investigator laboratory inspections, semi-annual animal facility inspections and procedural observations. The LAC should contact the TCC to arrange a procedural observation when the lab wishes to initiate any activities described in the approved application that require post-approval observation.



**FIGURE 2** | Number of research personnel certified by TCCs (as of 26 October 2009). The number of personnel certified by TCCs has been steady since the LAC certification program was initiated in 2003. The recent increase in the number of personnel certified in mouse-handling techniques is due to an upsurge in mouse research at UNC-Chapel Hill in 2009.



**FIGURE 3** | Number of research personnel certified by LACs (as of 26 October 2009). There was a gradual increase in the number of individuals certified during the early years of the program (2003–2006). As the program developed (2007–2009), more research personnel were trained and certified by LACs, freeing the TCCs to concentrate on other responsibilities. Without the LAC program, the TCCs would have been responsible for certifying all of these individuals.

**Training and certification of the LAC**

Formal training for the LAC program is provided by the TCCs with assistance from the DLAM veterinary technical staff. Training consists of two mandatory parts: (i) hands-on technique training and (ii) assessment and lecture. Hands-on training of the prospective LAC includes satisfactory demonstration of all routine handling techniques and procedures that are done as part of an approved application (i.e., administration of common anesthetics, common injections, blood withdrawal, oral gavage, euthanasia, aseptic technique, etc.) Although each laboratory may carry out different procedures, all prospective LACs receive basic training in handling rodents. Aseptic technique training is required if survival surgery is included in the laboratory’s approved animal use applications.

When the prospective LAC has completed hands-on technique training, he or she meets with a TCC for a one-on-one lecture session to review animal welfare policies, IACUC rules and regulations, responsibilities of research personnel using animals and the LAC’s specific responsibilities. According to need, the TCCs provide additional individualized hands-on training in one-on-one training sessions. The ability of the prospective LAC to effectively train other individuals in the laboratory in hands-on techniques is also assessed.

When the prospective LAC has satisfactorily completed both the hands-on training and the lecture session, he or she is certified as a LAC and approved to train and certify other lab members in rodent-handling techniques.

**Hands-on training classes.** At UNC-Chapel Hill, rodent-handling classes include basic mouse-handling

techniques, basic rat-handling techniques and aseptic technique (course descriptions given below). The hands-on classes are not restricted to prospective LACs; any animal handler can register for and attend the classes. Because space is limited, however, it may be useful to allow any prospective LACs to register first and then, if spaces are still available, allow other individuals to register.

During hands-on training, the TCCs evaluate each individual’s proficiency level. Proficiency Level I indicates that the individual is competent in the required handling techniques and demonstrates the ability to train others. This proficiency level means that the individual is ready to train and certify other laboratory personnel without additional practice. Proficiency Level II indicates that the individual is hesitant when carrying out some of the required handling techniques. At this level, the individual requires more experience practicing the techniques before being allowed to train other laboratory personnel. He or she may handle animals in the laboratory but may not train other lab members. Proficiency Level III indicates that the individual is very hesitant in handling animals and demonstrating techniques. He or she requires much more practice and experience in order to be considered proficient. He or she may handle animals in the laboratory but requires considerable practice before being allowed to train other personnel.

Proficiency Levels II and III distinguish between individuals who are close to being proficient and need only a small amount of practice and individuals who are very hesitant and require much more practice. This information helps a PI to know how close a prospective LAC is to being proficient. It also helps the TCCs when they are retraining an individual. Once an individual with Proficiency Level II or III feels that he or she has reached Proficiency Level I, he or she should contact the TCC to arrange observation and subsequent certification.

After a LAC is officially trained and certified in the routine procedures, he or she is approved to train and certify other lab members. When a LAC certifies another lab member, he or she must notify OACU. UNC-Chapel Hill uses an online registration system to record the name of the individual trained and certified, the techniques that he or she is certified to carry out and the date on which the training and certification was completed. This electronic entry automatically becomes part of the IACUC training database.

Currently at UNC-Chapel Hill, LAC recertification is not routinely required. However, a LAC or an entire laboratory may be retrained and recertified if the LAC or laboratory is cited for improper animal handling or for failure to follow standard operating procedure.

**Scheduling and registration.** At UNC-Chapel Hill, a dedicated training lab allows the TCCs to offer a variety of training classes each week as well as one-on-one training one day each week (or more, if necessary). Because of the prevalence of mouse users at UNC-Chapel Hill, mouse-handling classes are held two or three times a month; rat-handling and aseptic technique classes are held once a month. Class size is limited to 12 or fewer individuals to allow TCCs to effectively train, observe and certify each attendee. Individuals can register for each class through an online registration system.

Before research personnel can attend an OACU training session, they must complete some registration forms and orientation sessions: (i) the Research Profile registers the individual in the online system and records demographic information; (ii) the Lab Worker Registration registers the individual with the Environmental Health and Safety department, which tracks all animal users; (iii) the Animal Handler Questionnaire registers the individual with the university's Occupational Health Program (annual updates required); (iv) the online IACUC Orientation reviews animal welfare regulations, IACUC policies and application completion (required every 3 years); and (v) the online DLAM Orientation reviews animal husbandry standard operating procedures and animal facility specifics (required every 3 years).

**Class descriptions.** Mouse Handling and Techniques is a hands-on class designed to teach basic techniques in mouse handling including restraint, simple injections, bleeding techniques, anesthesia and euthanasia. This class is required for personnel whose laboratories work with live mice. Similarly, Rat Handling and Techniques is a hands-on class designed to teach the same basic techniques for rat handling (restraint, simple injections, bleeding techniques, anesthesia and euthanasia) and is required for personnel whose laboratories work with live rats. Aseptic Techniques is a hands-on class designed to teach how to maintain sterility during rodent survival surgeries and is required for personnel whose labs carry out rodent survival surgeries.

#### LAC NETWORK

An offshoot of the LAC certification program, the Network of Laboratory Animal Coordinators (NLAC) was formed in 2004 by the OACU Director, with the goal of enhancing communication between the animal

research laboratory personnel, the IACUC, the OACU and the DLAM. NLAC is led by the NLAC Steering Committee, which is composed of dedicated and knowledgeable LACs as well as PIs and representatives from the OACU and the DLAM. NLAC is a voluntary organization of hundreds of LACs from research laboratories on campus. NLAC activities support the University's mission to expand knowledge and teach individuals involved in all levels of animal research by providing a forum for the open exchange of ideas and an information network for policies, procedures and regulations. NLAC gives LACs their own 'organization' in which to share ideas, techniques and resources. NLAC has a website and list-serv that are used by LACs on a daily basis. NLAC also sponsors quarterly seminars on topics such as animal facility biosecurity, talking to the public about animal research, mouse models and vendor services.

#### CONCLUSIONS

Six years after its full implementation, the LAC certification program has proven to be a successful method for consistently training large numbers of animal handlers, especially in a decentralized university setting. At UNC-Chapel Hill, thousands of research personnel have been successfully trained by certified LACs (Fig. 3), assisting the OACU Training and Compliance Unit with hands-on training and freeing the TCCs to do more specialized training, complete inspections, maintain compliance and carry out post-approval monitoring. The incidence of deficiencies identified during semi-annual laboratory inspections and procedural observations has decreased during the time the program has been in place. The number of non-compliance self-reports has increased, indicating that laboratories are knowledgeable about and comfortable with identifying deficiencies. Additionally, the number of positive interactions between TCCs and research personnel has increased over the years the LAC program has been in place. This positive relationship is notable because compliance and regulation, which form a large portion of the TCCs' job, is sometimes viewed unfavorably by research personnel. These benefits have resulted in UNC-Chapel Hill considering the LAC certification program a successful enterprise.

#### COMPETING FINANCIAL INTERESTS

The author declares no competing financial interests.

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