

DESCRIPTION OF UNIVERSITY OF FLORIDA ANIMAL CARE SERVICES

AUGUST 15, 2007

Overview of University of Florida (UF) Animal Use

The University has an enormous diversity of research, scholarly and clinical endeavors. It has large and successful colleges of medicine, veterinary medicine, agriculture, engineering and the general sciences. Each of these units has an ongoing research enterprise and the University has a history of pioneering research. UF biomedical research component has a strong emphasis on neuroscience, aging, gene therapy, and cancer. Radiation oncology, neurology, urology and emerging pathogens are also areas of growing strength. The College of Liberal Arts and Sciences (CLAS) research is predominantly observational, behavioral, neuropharmacological and physiological in scope and nature. The use of animals varies widely and ranges from wildlife observation to transgenic production laboratories.

Currently, UF has nearly 434 faculty using animals in various research and teaching programs. The IACUC has on file nearly 1,308 approved projects or protocols using animals (See Appendix- Animal Usage). Some of these projects are in the process of applying for funding, others are waiting funding, but most are ongoing and funded.

Animal Care Services (ACS)

ACS is responsible for providing a humane and high quality animal care and use program to facilitate research and teaching at the University of Florida. ACS accomplishes this by providing high quality service, expertise and guidance in all matters related to the care and use of animals. The program unit has been continuously accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care International (AAALAC) since 1966 and is registered with the United States Department of Agriculture as a research site. It is operated on fee for service basis.

ACS employs six full time veterinarians, one half time veterinarian, six full time veterinary technicians and one Surgical Manager in addition to the Attending Veterinarian/Director. The veterinary staff is primarily involved in providing or supervising veterinary care, protocol review, surgical services, pathology services, diagnostic laboratory services, training of investigators and investigator staff, and compliance. The veterinarians are listed below.

August H. Battles, D.V.M., MS, Director
Mary Reinhard, D.V.M, Pathologist
Traci Krueger, D.V.M. Clinical Veterinarian
Harvey Ramirez, D.V.M., Clinical Veterinarian
Joan Cole, D.V.M., Clinical Veterinarian
Bernadette Zamora D.V.M., Ph.D., Diagnostic Laboratory Manager

Dr. August H. Battles serves as the Attending Veterinarian for the University and has the responsibility for and authority over all animals used at the University of Florida for research, teaching and testing. Dr. Battles provides overall ACS leadership. ACS has four major subdivisions; Administrative Services, Veterinary Care, Pathology and Laboratory Services, and Operations. The heads of each of these sections, with the exception of Operations, report directly to Dr. Battles.

The *Administrative Services* section is responsible for all business operations of the department including purchase of all animals and supplies, clerical support for ACS, recharge for animal purchases, per diems

and other services, receiving, budgeting, payroll, and financial forecasts and utilization reports. Tina Butts, BS, Assistant Director of Business, heads this section, has six staff and reports to Dr. Battles.

The *Veterinary Care* section is responsible for veterinary care, surgical services, training of investigators and investigator staff, quarantine program, rodent breeding program, shipping animals, safety and compliance. This section is also under the Director, Dr. August Battles. The veterinary clinical services section of the ACS is responsible for providing veterinary care for all animals. In addition this section operates two centralized surgical facilities, one located in the McKnight Brain Institute and the other in the Communicore Animal Facility (CAF). The veterinary technicians are responsible for assisting in delivery of animal health services and ancillary programs such as the sentinel program. The veterinary technicians report to the clinical veterinarians. Although they have primary assignments and responsibilities, the veterinary group works as a team to ensure coverage of critical tasks. Harvey Ramirez, DVM, Joan Cole, D.V.M., M.S., DACLAM, and Traci Krueger, DVM, DACVIM are clinical veterinarians that support the program. Whitney Hartz, CVT, LATG, SRS is the Surgery Manager and is responsible for maintaining and providing support for the central surgery. Ms. Hartz reports to Dr. Ramirez.

Ryan Fiske, BS, LATG, is the colony manager for the rodent breeding program and has 7 years work experience with transgenic animal program. Mr. Fiske joined UF/ACS from Novartis Institutes of Biomedical Research, where he was the Transgenic Services Coordinator. Mr. Fiske reports to Dr. Battles.

Charles Mason, MS, LATG is the Training Coordinator and is responsible for coordination of all aspects of ACS training program. His duties include American Association of Laboratory Animal Science training of ACS staff as well as training of new staff in Standard Operating Procedures and new investigator training. He also provides oversight of occupational health and safety (OHS) within the ACS. He works closely with the University Environmental Health and Safety department, which is responsible for University OHS to ensure that ACS adheres to EH&S policies. He is also responsible for coordinating the development and maintenance of standard operating procedures. Mr. Mason reports to Dr. Battles.

The *Pathology and Laboratory Services* section is responsible for the clinical diagnostic laboratory as well as providing anatomic and clinical pathology research support services. This section also has general oversight for rodent health. Mary Reinhard, DVM, DACLAM, DACVP, Assistant Director of Veterinary Pathology is responsible for the pathology section and reports to Dr. Battles. Dr. Bernadette Zamora DVM, PhD., Diagnostic Laboratory manager, is responsible for the diagnostic laboratory and reports to Dr. Reinhard. Two additional staff members assist in support of the diagnostic laboratory and the sentinel health-monitoring program.

The *Operations* section is responsible for husbandry and facility maintenance. Michael P. Riley, BS, CVT, LATG, Assistant Director for Operations, heads this section and reports to the Director. This section is responsible for providing the husbandry needs of research animals housed in the ACS facilities. It ensures this by providing training on standard operating procedures and policies. This section is also responsible for the maintenance of facilities and equipment. Animals are housed and cared for by a staff of animal care specialists, overseen by four managers; Sherry Scruggs, BS, RLATG, Luis Zorrilla, BS, RLATG, Robert Gump, BGS, LATG and Rachelle Wright, BS, RLATG. Patricia Misita is manager of the loading dock and is responsible for receiving animals, supplies, and equipment, animal transport and cage wash at the CAF. Michael Cormier, RALAT, Facilities Engineer, has responsibility for the maintenance of all ACS facilities and equipment and has two staff positions. Mr. Cormier is a licensed Stationary Engineer

and a College certified HVACR Technician. A total of 34 staff have AALAS certification. Seventeen have ALAT, nine have LAT status and eight have achieved LATG.

Four additional positions report to Dr. Battles. Greg Marwede, Coordinator, Management Analysis, coordinates all human resource activities. This includes oversight of all hiring and disciplinary actions. Mr. Marwede also serves as a liaison with employee organizations. Charles Mason, Training Coordinator; organizes professional development and duty specific training of ACS staff. His duties include introductory and technical training to all UF research staff utilizing animals, the creation and refinement of ACS SOPs, Guidelines, and Policies, and he provides safety related liaison between EH&S, research staff, and ACS staff. Evan Hochman, BA, serves as the IT expert. His duties comprise of the construction of databases, management of the website (myACS), and performing needed technological support. Cristina Merricks, BA, is Executive Assistant to Dr. Battles and is responsible for scheduling, the ACS Newsletter and other duties.

Dr. Battles meets weekly with the management of ACS. Section heads provide a weekly report to Dr. Battles on issues relating to ACS. In addition, Dr. Battles heads a Faculty Advisory Committee and participates in the Animal Care Council, both of which convene monthly. The Faculty Advisory Committee consists of Investigators that use animals and provides advice to Dr. Battles on animal care policies and issues, while the Animal Care Council is comprised of College Deans and the Director of the McKnight Brain Institute and provides advice to the IO on financial issues. Both are advisory in scope and nature.

Quality Assurance

Standard Operating Procedures, Forms, Policies, and Guidance document generation

SOPs and other ACS documents are systematically generated for common (“standard”) tasks performed. The staff performing the task generates the initial description of specifically how they perform the task. This draft is brought into standardized format, reviewed by functional area supervisors and managers, clinical veterinarians, and senior management. EH&S also is provided an opportunity to review SOPs with safety issues. Reviewer comments are incorporated into document drafts. The final document is sent to the Director for review and comment or approval. SOPs addressing tasks associated with GLP studies receive an additional review by the Quality Assurance Unit of the Powell Gene Therapy Center. Following approval, SOPs are formally distributed to all functional areas impacted by the activity addressed. Previous versions, in the case of revisions, are “pulled” from individual SOP books. ACS personnel are to train on newly posted SOPs within 30 days of it being issued to the local SOP book. Training records are posted to a digital tracking log and filed for long-term archival retention.

Overview of Facilities

The University of Florida provides a spectrum of facility types for housing a variety of different animal species. ACS manages 15 facilities that include environments ranging from ABLs-L-3 to rodent barriers, which are essential to the development and maintenance of unique transgenic rodents and the conduct of experimental protocols. The species housed range from mice to large animals such as pigs, sheep, horses, cattle and non-human primates. Strict entrance requirements and operational guidelines ensure that the integrity of the barriers and a pathogen free health status is maintained.

There is a total of 169,026 square feet of ACS managed space. Of that total 70,150 is animal housing and 98,879 square feet of support space. There are also three paddocks (20 acres).

Facilities under Animal Care Services Management

JHMHSC Communicore Building (CAF)

This facility has 243 rooms (119 animal rooms/cubicles), 49,482 total square feet. This is a multi-purpose facility with support areas. This includes areas for conventional housing, Illinois cubicles, Biohazard containment (ABSL-3) and a surgical suite. This is the core animal facility and is located in the basement of the Communicore building located in the JHMHSC.

Shands Hospital

One animal room (room 6105) and 1 support room (room 6106), 261 total square feet. SPF rodent housing is located on the 6th floor of the building.

McKnight Brain Institute

Nine animal rooms, 14,090 total square feet. SPF rodent and feline housing with support areas (including surgical suite) located about 100 yards from core animal facility.

Physiology

Two animal rooms, one cold, one room temperature, approximately 245 square feet for long term housing under experimental conditions. These house conventional rodents and are located in the Basic Science Building in the JHMHSC.

Cancer and Genetics Building

This facility opened on October 1, 2006. There are a total of 51 rooms (18 animal rooms), 24,300 NSF of SPF rodent housing with support areas located about 1/3 mile from the core animal facility. All housing is in ventilated racks or semi-rigid isolators. The support space includes a cage wash facility, with a rack and a tunnel washer, bulk autoclave and procedure rooms associated with each animal housing suite.

Progress Park, located 20 miles from JHMHSC.

Large Animal Facility - 10 stalls that are A/C and heated and 20 stalls that do not have A/C and heating (24,098 total square feet). Large Animal Containment Facility (ABSL2) - 8 rooms that have A/C, heating, (942 square feet). Large animal housing with limited support areas.

Small Animal Facility - 6 animal rooms, 5,443 square feet. SPF rodent housing with limited support areas.

ACS ARF, (34th Street Farm) located 1.5 miles from JHMHSC.

10 Buildings, 5 animal rooms, 177 outdoor housing runs, 17,680 square feet. Primarily small ruminants, primates, and kennels.

CVM Metabolism Building, located 0.5 miles from JHMHSC.

29 rooms (16 animal rooms), 9,359 square feet. Multi-use facility. Primarily indoor housing for primates, dogs and cats with support areas.

CVM ARF, located 0.25 miles from JHMHSC.

1 building, (2 animal rooms), 942 square feet. Houses conventional rodents in isolated conventional facilities.

Food Science and Human Nutrition.

1 building, 4 animal rooms and 2 support rooms. 1,086 square feet. Located 0.5 miles from JHMHSC.

Rocky Point Facility

2.5 miles from JHMHSC, 1 animal room and 1 procedure room. 214 square feet.

Psychology Building (CLAS).

0.25 miles from JHMHSC, 1 building, 17 animal rooms and 5 procedure rooms 3,420 square feet.

Zoology Building (CLAS).

0.25 miles from JHMHSC, 2 building, 10 animal rooms 1,808 square feet.

Bivens Arm Research Center (BARC).

Located 0.75 miles from JHMHSC, 5 rooms (41 cubicles), 3,198 square feet. ABSL3 and SPF facility. Primarily indoor housing for cats with support areas, including an incinerator.

Pathology

12 animal rooms, 1,604 square feet. Rodent SPF breeding colony located in JHMHSC

Animal Resource Professional/Management/Supervisory Personnel Duties, Experience and Qualifications

August H. Battles, D.V.M., M.S., DACLAM is a diplomate of ACLAM. He currently serves as the Director of Animal Care Services and Attending Veterinarian at the University of Florida, the Veterinary Medical Officer at the Veterans Affairs Medical Center in Gainesville, Florida, and a consultant in laboratory animal medicine to other institutions and organizations such as AAALAC-International and NASA. Prior to joining the University of Florida in 2001, Dr. Battles was Director of the Animal Resources Center at The University of Chicago. With over 20 years of experience in laboratory animal medicine as Director of animal care facilities at academic institutions, Dr. Battles has led the design on multiple animal facility renovation projects at three academic institutions that included major renovations of cage wash, animal housing for a variety of species, surgical suites, ABSL-2 and ABSL-3 facilities. Dr. Battles has led the design of two completed large rodent housing facilities and an ABSL-3 facility for housing cats. Currently, at the University of Florida, he is involved in the design of a 45 gsf animal facility with construction beginning January 2007, the design of an Emerging Pathogens Building which will include a ABSL-3 facility with construction scheduled to begin summer 2007, and the renovation of over 30 gsf of existing animal facility space that includes a ABSL-3 suite, surgical suite, large animal housing and other support space. He has been the principle investigator on four funded NIH grants for animal facility improvement and is either the author or co-author in 23 publications. While at the University of Florida, he has authored 3 funded grants where the Vice-President served as the Principle Investigator, totaling over \$7.6M for new animal facilities, renovations and equipment. He attends 4 annual professional meetings each year. Dr. Battles is also a member of the American Veterinary Medical Association (AVMA), the American Association of Laboratory Animal Science (AALAS), The American Society of Laboratory Animal Practitioners (ASLAP), the Charles Louis Davis D.V.M. Foundation, and the American College of Laboratory Animal Medicine (ACLAM). **One hundred percent of his time is devoted to ACS.**

Harvey Ramirez, D.V.M., is a Clinical Veterinarian. He is responsible for day-to-day operations of rodents and nonhuman primates. This includes supervision of the centralized surgical units in the Communicore and the McKnight Brain Institute. He has completed one year of a NIH supported residency in Comparative Medicine. He has two years experience in small animal medicine and six years experience in laboratory animal medicine including his residency training. He attends on average one national meeting annually. **One hundred percent of his time is devoted to ACS.**

Joan Cole, D.V.M., M.S., DACLAM is an ACS Clinical Veterinarian. She is an ACLAM Diplomate and has assumed part of the duties of the existing clinical veterinary staff. She has completed a three year NIH supported residency in Laboratory Animal Medicine and has 17 years experience in laboratory animal medicine including her residency training. She has 12 years private practice experience in small animal medicine. She is a member of the AVMA, AALAS and ASLAP. She will attend on average one national meeting annually. **One hundred percent of her time is devoted to ACS.**

Mary Reinhard, D.V.M., M.S., DACLAM, DACVP, is the ACS Pathologist and is a Diplomate of ACLAM and of the American College of Veterinary Pathology (ACVP). She has 20 years of experience in laboratory animal medicine, three years of which were in an NIH funded post-doctoral training program. She also completed a three-year pathology residency. She has 11 years experience as the Director of industrial (pharmaceutical) laboratory animal programs and six years in academic medical center laboratory animal programs. She has been the co-investigator on one funded NIH research grant. She also serves on the IACUC as a designee alternate for the Attending Veterinarian. She is also a member of the AVMA, AALAS, ASLAP, the Society of Biomaterials and the Society of Toxicologic Pathologists and ACLAM. She attends an average of one professional meeting a year. **Eighty percent of her time is devoted to ACS.**

Bernadette Zamora, D.V.M., Ph.D., Diagnostic Laboratory Manager. She has three years of experience in laboratory animal medicine including two years in a laboratory animal training program. She also has 17 years of experience in academia in clinical laboratory and public health. She attends an average of one professional meeting a year. She is a member of AALAS. **One hundred percent of her time is devoted to ACS.**

Traci Krueger, D.V.M., M.P.H., is a Clinical Veterinarian. She is responsible for the day-to-day operations of food animal species including sheep, goats, cattle, and swine. Additionally, she assumes partial veterinary duties in the day-to-day operation of cats and rabbits. She completed a two-year food animal medicine and surgery residency and has two years of private practice experience. She is a member of the American Association of Small Ruminant Practitioners (AASRP) and the American Sheep Industry Association. She attends on average one meeting annually. **Seventy five percent of her time is devoted to ACS.**

Michael P. Riley, B.S., CVT, LATG, is the Assistant Director for Operations and is responsible for day-to-day husbandry care. He also is responsible for maintenance of facility and equipment. He has 20 years experience in the Army as a noncommissioned officer in Veterinary Services. He has nine years experience in civilian laboratory animal care.

Sherry Scruggs, B.S., RLATG, is the Outlying Facilities Manager. She manages the animal facilities at CLAS and Food Science and Human Nutrition. She has 26 years of experience at UF with 11 as a research technician and five years experience as Supervisor of Surgical Services, Veterinary Medical

Teaching Hospital (VMTH). She has six years of laboratory animal experience in ACS. She attends a national professional meeting once every two years as well as more frequent local and regional AALAS meetings.

Luis Zorrilla, B.S., LATG, is the McKnight Brain Institute and Bivens Arm Research Center (BARC) Manager. He has five years of laboratory animal experience. He attends a national professional meeting once every two years as well as more frequent local and regional AALAS meetings.

Robert Gump, B.G.S., LATG is the Manager of the Cancer and Genetics Institute Research Complex Vivarium. He has 18 years of laboratory animal management experience and spent four years as a research associate in physiology and pharmacology. He attends a national professional meeting once every two years as well as more frequent local and regional AALAS meetings.

Rachelle Wright, B.S., RLATG, is the Manager of Large Animal Services. She manages the 34th Street Farm, ACS ARF, the metabolic building at the College of Veterinary Medicine, HSC Large Animal Section, and the Rocky Point animal area. She has seven years of laboratory animal experience. Ms. Wright also has over four years of supervisory experience between ACS and the Jacksonville Zoo's ape section. Previous to this position, she was the Senior Veterinary Technician for nearly three years.

Patricia Misita, B.A., is the Loading Dock Manager. She manages the CAF loading dock and cage wash and co-ordinates the movement of animals and supplies between facilities. She has 26 years of experience in research supervisor support involving human and animal subjects and three years of managerial experience in toxicology and the production of enzymes. She has six years of laboratory animal experience as a technician and technologist.

There are a total of 87 authorized full time equivalents (FTE) in ACS. This number includes veterinary care, husbandry and administrative support staff. Of these 87 FTE there are 82 currently filled.

Description of Special Facilities

Biohazard Containment

ABSL3 (CAF): The Infectious Disease Isolation area consists of five rooms with a total of 34 "Illinois Cubicles" under negative pressure. The rooms are entered from a "clean" corridor and exited from a "dirty" corridor. A pass-through autoclave leads from the infectious disease suite to the dirty side of the cage washing facility. Exhaust air is HEPA-filtered out of this suite. Access is controlled by a biometric door lock. Personal protective equipment (PPE) is available at the entrance to the facility. Exit from the suite is via pass through showers and locker rooms. Procedures are performed within a room by using one cubicle equipped with a Class II A/B biological safety cabinet. All biosafety cabinets are certified annually. All ACS personnel entering this area are provided with disposable gowns and scrub suits, foot covers, masks (type designated by EH&S), hair bonnets, and gloves. PPE must be disposed of as the suite is exited. Animal care staff are required to shower and change uniforms before they enter an SPF housing area after entering non-SPF areas. Cages used in the infectious disease suite (including litter), water bottles, food hoppers, and other non-disposable items are autoclaved before cleaning and washing. Dead animals are placed in leak-proof plastic bags and either stored in a freezer or immediately incinerated. After each set of experiments, ACS decontaminates containment areas. The UF EH&S reviews and approves all procedures. Temperature, humidity and room pressures are monitored via a Building Automation System (BAS) by Siemens.

ABSL2 (CAF): Animals exposed to BSL-2 pathogens or human tumor cells are housed in a cubicle suite (3 rooms with 5 cubicles in each). A Class II Type A/B biological safety cabinet is available within each room in the suite. Used PPE and soiled animal caging materials must be bagged for removal from the facility, as there is not a pass-through autoclave. Caging materials are autoclaved in the bulk autoclave within the soiled side of cage wash.

ABSL2 (Progress Center Large Animal Facility) This facility contains eight rooms (1870 sq. ft.) that are suitable for containment of BSL-2 agents in large animals such as adult horses or cattle. Each room is equipped with internal pipe fencing and tie downs to safely handle large animals. The air from the containment facility is HEPA-filtered. Fecal waste is collected in a holding tank and inactivation is accomplished using chlorine.

ABSL-2/3 (Bivens Arm Research Center (BARC)) The ABSL-2/3 suite consists of three rooms with a total of 23 "Illinois Cubicles" (991 sq. ft.). Each room has an epoxy floor and reinforced fiberglass panel ceiling and walls. An autoclave leads from one of the rooms to the outside. Exhaust air is HEPA-filtered out of this suite. One room is equipped with a Class II A/B biological safety cabinet in which procedures are performed. Temperature, humidity and room pressures are monitored via a Building Automation System (BAS) by Siemens.

Sanitization and Sterilization Equipment

Four rack washers, one located in CAF, one located in VMC, one located in the Brain Institute Facility and one located in the new Cancer and Genetics facility.

Three tunnel washers, one each are located in CAF, the Brain Institute and the new Cancer and Genetics facility.

One bulk autoclave is located in CAF between the ABSL3 soiled corridor and the soiled side of cage wash and another in the new Cancer and Genetics facility to support the SPF barrier.

Eight medium autoclaves (2X3X4): Two located in the Brain Institute, two in CAF, one in VMTH and one at BARC . The CAF central surgery also has an autoclave that is used in case of emergency to maintain SPF colonies. The McKnight Brain Institute also has an autoclave in its surgery L5-181. The autoclave in Progress Park Large Animal Facility, room A127 is smaller (16X16X26). An autoclave (16X16X26) is also located in room 105 of building 336 at the ACS ARF.

Incinerators

ACS operates three pathological waste incinerators. One unit is located at the BARC (400lb/hr capacity), and a second unit is located in CAF (400lb/hr capacity). A larger unit (495lb/hr capacity), with associated electric hoist and rail system is part of the Progress Park Large Animal Facility.

Imaging Resources

ACS has a lead lined x-ray room and C-Arm immediately adjacent to the CAF surgery.

Ultrasound is available through ACS' Terason Ultrasound System (Model Classic Terra 2000 Vet).

Imaging may also be obtained following an internal medicine consult at the UF College of Veterinary Medicine. CT capabilities are also available through the UF College of Veterinary Medicine.

In addition, an imaging facility in the Brain Institute (not ACS managed) has a variety of imaging equipment including five MRIs (4.7T 33 cm horizontal bore, 11.7T 40 cm horizontal bore pumped to 2.2K, 11.7T/500 MHz 5 cm vertical bore, and 14.1T/600 MHz 5 cm vertical bore), with a 21T MRI proposed to be added. This imaging equipment is dedicated to research use.

Irradiator

There are irradiators available for use in two ACS facilities although the machines are not managed by ACS. Both irradiators are model Gamma Cell 40 low dose rate cesium sources made by MDS Nordion. When new, they provided 110 rads/min. The chamber is cylindrical (4.1 inches high X 12.3 inches diameter). The CAF unit is approximately 20 years old and the C&G unit is new.

Surgery Facilities

There are dedicated surgical suites in three ACS facilities (CAF, The Brain Institute and the Progress Park Large Animal Facility). In addition all SPF rodent barriers have areas suitable for rodent surgery. Contract surgical services can also be arranged where a specific surgery is performed by one of the ACS staff.

The **CAF Surgical Suite** consists of a room for surgical prep of animals, a surgical supply room, areas for surgeons' surgical scrub, and three surgery rooms. One room is used as an X-ray suite and another is used for post operative recovery. Each surgery room is equipped with tables, overhead surgery lights, anesthesia machines, buckets, instrument and IV stands. Species using this facility include sheep, primates, pigs, cats, rats, rabbits, and dogs. Please note that the sheep and primate surgery is performed using biohazard containment techniques. The suite is also used for the ACS Aseptic Technique Workshop Wet Laboratory.

The CAF surgery facility support and monitoring equipment includes pulse oximeter, capnograph, end tidal anesthetic gas, indirect blood pressure (oscillometric), electrocardiograph, automated thermometer, ventilator, fluid pump, hot water circulating pads, forced air warmer, iSTAT blood gas and electrolyte machine.

The **Brain Institute Surgical Suite** has one room for rabbit and cat procedures and a separate room for rodent surgery. The suite also includes a room for surgical prep of animals, a surgical supply room, an area for surgeons' surgical scrub. Each surgery room is equipped with tables, overhead surgery lights, anesthesia machines, buckets, instrument and IV stands. Species using these facilities include rats, mice, pigs, rabbits, and cats.

Progress Park Large Animal Facility has a large animal surgery equipped with a table capable of handling an adult cow/horse.

Rodent Barrier Surgery Facilities-There are also rooms set up for rodent surgery in rodent barriers. There are three rooms in CAF for rodent surgery. These procedure rooms are equipped with a precision vaporizer, oxygen supply, a comfortable chair, a biosafety cabinet or cage change station, and anesthetic gas scavenging. These surgical facilities, with free anesthetic agent use within the barrier facilities, are designed to encourage animal users (e.g., investigators, graduate students, etc.) to perform surgeries (and other procedures) in the barrier facilities instead of removing them to investigator's laboratories. The intent is to provide free anesthetic and a surgery facility as a means to reduce the number of surgical facilities and reduce the need of the animal to leave the SPF barrier.

The C&G animal facility (SPF rodent barrier) has nine procedure areas which can be used for rodent surgery as the need arises. It is anticipated that rodent surgery rooms in this facility will be equipped similarly to those in the CAF rodent barriers.

Vapor Phase Hydrogen Peroxide Generators

ACS has purchased two machines that use hydrogen peroxide in its vapor phase to sterilize surfaces. This technology is used as an adjunct/replacement to standard chemical routine sanitation of animal rooms to prevent spread of animal pathogens. It is also used to enhance personnel safety in ABSL3 suite to ensure post study sterilization. Because it is less damaging to sensitive equipment, and as a gas it is more reliably and effectively distributed, it can be used where chemical and heat sterilization is impractical. These are available to sterilize research equipment as the need arises.

Breeding Colony Operations and Management

The University of Florida's department of Animal Care Services (ACS) provides day-to-day management and operation of a rodent breeding colony.

This breeding colony is managed as a barrier facility. All breeder stock introduced to the facility are Specific Pathogen Free (SPF) in compliance with the ACS rodent SPF policies; available at acs.ufl.edu/policies. Many animals are purchased from "approved vendors"; commercial vendors with comprehensive and reliable quality assurance programs. Other animals that originate from "unapproved vendors", such as an academic institution or governmental agency, are only introduced to the colony after undergoing ACS quarantine and sentinel program testing. The breeding colony facility is behind two levels of biometrically controlled security doors—one at the vivarium entrance and a second at the suite itself. Only trained ACS staff, facility engineering staff, and escorted guests (such as Principal Investigators) are permitted within the colony. Only trained ACS staff members perform animal husbandry tasks or technical procedures.

ACS technical staff consists of AALAS certified technicians. The colony manager has over seven years of breeding colony management experience gained in an industry setting. The colony coordinator has over four years of rodent colony management experience gained at Jackson Laboratories and in academia. The level of training and experience of the colony's staff, their standardized practices, the quality and technology of the animal housing systems, and the functional capacity of the vivarium itself, taken together directly contribute to production economies and efficiencies and to animal stock consistency.

All breeders are maintained in either individual ventilated cage racks (IVCR) or semi-rigid isolators. All supplied ventilation is HEPA-filtered. Each IVCR and isolator has sentinel animals in place to provide colony quality assurance. Sentinel animals are tested quarterly. All animals are maintained on a 12:12 hour light cycle. Animal housing room lighting has two available lighting levels that are motion sensor controlled. Room lights can not be turned on during the scheduled hours of darkness (only a room red light is available).

Room air temperature and humidity, light cycles, room air pressure balancing, and automatic watering systems are all electronically monitored. Automatic text message notification is provided to facility engineers if environmental parameters exceed set points or equipment malfunctions.

Water provided is Reverse Osmosis (RO) for animals maintained on IVCR and RO, and autoclaved for animals maintained in isolators. Water is tested monthly for microbial contamination, and annually, samples are collected for comprehensive water quality testing, e.g. heavy metals, trihalomethane, volatile

organic compounds, pesticides, and herbicides. All food is irradiated and specialty diets are provided as requested and/or as indicated for breeding colony productivity.

Animals are housed on sterilized direct contact bedding. Animal caging is polysulfone construction of size sufficient to meet or exceed ILAR Guide standards. Following routine mechanical sanitization (tunnel/rack washer), all cages are then autoclaved before animals are introduced.

ACS staff maintains breeding records to track stock/strain/line heritage. This is available to investigators via a web based platform. Investigators can request breeding scheme strategy adjustments at any time.

Tail biopsy samples are collected by ACS staff, as requested by the investigator, for genotype testing. ACS staff follow the provision of the ACS Tail Biopsy Guideline; available at <http://acs.ufl.edu/guidelines>. Other tissue samples can be collected as requested by the investigator (mucosal swab or blood for example). Individual animals are permanently identified at the time of biopsy either by ear punch/notch or ear tags.

Pups are weaned at 21 days of age, unless extended weaning is necessary to enhance survival rates. Animal weight at weaning can be measured and recorded if requested. If requested by the investigator, culling by gender is provided to enhance survival rates of the target gender.

Available ACS services include, but are not necessarily limited to:

- Set up mating pairs
- Maintenance of the breeding database
- Timed matings
- Copulation plug checks
- Weaning
- Tail biopsy
- DNA preparation
- Blood collection
- Animal identification
- Antibiotic water administration
- IP or SQ injections
- Litter weight at weaning

Genetic Monitoring Program

Plans are being developed to offer this service.

Clinical Laboratory-In-House Diagnostic Laboratory Capabilities.

Hematology: ACS has an automated hematology unit (Hermavet 1700) specifically designed for veterinary medicine that is capable of providing up to 27 parameters on wide range of species including those commonly used in research. Routine specimens can also be sent out to the University of Florida College of Veterinary Medicine or IDEXX a contract laboratory. Stat manual WBC counts (Unopette), packed cell volume, total protein (clinical refractometer), and WBC differentials are also available in-house in the event of mechanical failure.

Clinical chemistry: ACS has an automated bench top clinical analyzer (Alfa Wasserman Vetace) for measuring serum proteins, enzymes and electrolytes. Specimens can also be sent to a veterinary reference laboratory, IDEXX or the the UF College of Veterinary Medicine.

Parasitology: All routine parasitology is performed in-house; if numerous large animals are being processed then parasitology may be sent to IDEXX. There are two binocular laboratory scopes (Leitz Dialux and Olympus BX-41) and a dissecting microscope available for parasitology and other microscopy needs.

Routine fecals (and/or cecal contents) are prepared via (sodium nitrate) floatation and read in the ACS diagnostic laboratory.

A stained smear is also prepared and read on stool from non-human primates for protozoan identification. Cellophane tape anus preparations on rodents are examined for *Syphacia spp.* ova. Cellophane tape preparations, skin scrapings, hair pulls, pelts, and other specimen are examined for ectoparasites. Blood parasite exams may be performed as appropriate. *Giardia* spp. fecal antigen testing (IDEXX SNAP® *Giardia* Test) In-house consultation with the parasitologists at the University of Florida College of Veterinary Medicine, is available as necessary.

Urinalysis:

Urinalysis is performed using Multistix 10SG reagent strips and by microscopic examination of urine sediment or sent out to a veterinary reference laboratory or the UF College of Veterinary Medicine.

Mycology:

Routine dermatophyte mycology is performed in house with cultures grown on DTM agar, Sabaroud agar with/ without cholamphenicol. Specialty laboratories or the UF School of Veterinary Medicine would be used to identify mycologic specimens as necessary.

Bacteriology:

Routine bacteriology is sent to a veterinary reference laboratory. Samples are collected with appropriate transport culture media swab. Contact agar (RODAC or Hycheck®) plates are incubated in house (Forma Scientific Steri-Cult 200 incubator) for cage washer and room sanitation surveillance. Luciferase-based testing is also routinely used and provides real-time results. Sanitized rooms and cage washers are evaluated monthly by an ATP-based luminescence test system and quarterly with contact agar.

Annual sentinel screening for the following bacterial genera Mycoplasma, Salmonella, Pasteurella, Streptococcus, and Streptobacillus are done in-house using primary and special culture media. Confirmation and identification of suspect colonies are done at the Veterinary Medicine Teaching Hospital.

Autoclaves are evaluated weekly using *B. stearothermophilus* (Biological Indicators) with the ACS diagnostic laboratory incubating (Thermolyne Type 17600 Dri-Bath 57 °C Heat Block, for 48h with evaluation at every 24h interval).

Serology:

FIV (Feline Immunodeficiency Virus)/FeLV (Feline Leukemia Virus): IDEXX SNAP® FIV Antibody/FeLV Antigen Combo Test are performed in house. The following may also be processed at

IDEXX, Canine Heartworm Antigen, Canine SNAP® 3Dx® Test, *Borrelia burgdorferi* (Lyme Disease) antibody, *Ehrlichia canis* (Canine Ehrlichiosis) antibody.

Basic and comprehensive ELISA panels for mouse and rat pathogens that are being excluded from the facility are done in-house. Samples with positive or doubtful reactions are sent to Charles River Laboratories for confirmatory tests using MFI, IFA and HAI.

Molecular Testing:

PCR-based testing is used for diagnosis or confirming a diagnosis of viral, bacterial, or protozoal agents as appropriate, and to identify murine pathogens in tumors, cell lines, and biologic reagents. A contract laboratory is used for this service.

Specimen Preparation and Shipping:

Blood specimen for chemistry is centrifuged and the serum separated for transport to other laboratories. Blood samples for rodent serology are centrifuged, serum separated, and diluted prior to shipment for testing or in house testing. Serum samples for UF EHS-mandated Q-fever serology testing (sheep used in biomedical research only) are centrifuged and serum separated for transport to UC Davis. All specimens are prepared and packaged for shipment in compliance with Department of Transportation (DOT) regulations.

Necropsy Facilities

CAF -The necropsy rooms, cold storage (animal remains only), and the incinerator are located in the Communicore basement floor. The two necropsy rooms consist of an ACS dedicated room and a similarly equipped adjoining room for investigator use. The necropsy table size is suitable for the necropsy of mice to average sized swine and sheep. The room is equipped with specialty equipment for the collection of tissues and measuring organ weights, including a striker saw to cut through bone for removal of brains from medium and large size animals as well as a scale for measuring the organ weight of mice for phenotype comparison of wild type and transgenic mice.

Progress Park Large Animal Facility – A necropsy facility capable of handling adult horses or cattle is located adjacent to the large animal incinerator and across the corridor from cold carcass storage. The facility employs an electric chain hoist system for carcass handling.

Professional Pathology Services

Currently, all tissues are sectioned in the ACS necropsy room and sent to an outside lab (UF Veterinary Medical Center) for paraffin embedding, sectioning, and staining. The UF VMC provides a 48-72 hour turnaround time for both hematoxylin and eosin stained tissue sections with requests for special stains requiring an additional 24h. Cytologic samples are stained in our facility using the Wright Giemsa (Hema 3 Stain Set) and Gram Stain methods.

Glass slides are examined using a Nikon Elipse 80i microscope by the ACS Pathologist, Mary Reinhard, D.V.M., M.S., DACLAM, DACVP. The microscope is equipped with a side arm and an additional viewing head and a Nikon Digital Sight D5-L1 digital image live monitor. The additional viewing head and monitor are used for teaching purposes and for slide review with researchers. A Nikon Digital Sight D5-5M digital camera is mounted on the microscope for imaging. The camera is equipped with 4 “smart cards” that are collectively capable of storing up to 130 images. Images are downloaded into the Olympus Camedia software or into Photoshop 5.0 for viewing or for altering image size or color balance and stored

on digital media. This setup allows the pathologist to collect images during review sessions with investigators and for the storage of these images on a CD to be taken with the investigators when the session is over.

Animal Transport

The department has two vehicles designed to transport animals between facilities in a manner consistent with USDA regulations. They both have climate control and a separation between the driver and the animal transport compartments. The two vehicles are a 1999 Chevrolet 3500 Express van and a 1997 Ford F800 diesel truck with an enclosed climate controlled box. These are available to meet investigator needs.