Breeding Core Facility (BCF) Overview

About the BCF

One goal of LARC's mission to support the UCSF research and clinical enterprise is to provide laboratories with pathogen-free mice with specific genetic backgrounds as needed for experimentation. The BCF, created to fulfill this goal, is a contract breeding service available to UCSF investigators who conduct research with genetically modified mice.

BCF Services

- Set up and coordinate mating pairs
- Timed matings
- Copulation plug checks
- Weaning
- Tail snip collection for PCR
- Blood collection
- Animal identification
- Antibiotic water administration
- PI or SQ injections
- Liter weight at weaning
- Provide special irradiated diets (if needed)
- Rederivation of cryopreserved or of existing lines
- Maintain breeding database

Housing and Food

All mice in the BCF barrier are housed in disposable, irradiated, ventilated microisolator cages and all feed is irradiated or autoclaved. Water is purified through acidification. Special diets and/or water treatment are available per investigator request.

BFC Specific Pathogen Free Environmental Management

LARC breeding services take place in the BCF. Animals may not enter the facility unless they are rederived from an existing colony or are shipped directly to the barrier from an approved vendor and undergo a quarantine period of 5 weeks. In the interest of maintaining a sterile and organized mouse colony, laboratory staff does not have access to the barrier rooms where their animals are being bred. All breeding, weaning, animal identification, colony management, record keeping, tissue and sample collections are performed by experienced LARC technicians. To reduce the threat of

biocontamination, only LARC technicians and supervisors are allowed access to barrier housing and breeding rooms. All breeding services are provided on a re-charge basis.

Record Keeping and Identification

LARC maintains breeding records by employing breeding colony management software that tracks animal stock/strain/line and heritage. In addition to this data being available to investigators online, researchers may also request breeding scheme strategy adjustments at any time through emailing or faxing requests to the BCF manager. To enhance efficiency, completed orders will be delivered directly to the investigator's designated animal holding room or procedure room.

Tail snips for genotyping are collected by LARC technicians as requested by the investigator. Genotyping can be performed by either the requesting laboratory or sent to an outside laboratory for a rechargeable fee. Other tissue samples, such as mucosal swab or blood, are collected by BCF staff per investigator request.

Each animal can be permanently identified by tattoo. Other methods are available upon request. Pups are weaned at 21 days of age, unless extended weaning is necessary to enhance survival rates. Animal weight at weaning is measured and recorded upon request. If requested by an investigator, culling by gender or genotype can be provided to meet the needs of specific studies.

Rederivation Services

LARC participates in the transgenic mouse core facility to rederive mouse strains by embryo transfer. The core provides transgenic mouse production specific to research constructs. Rederivation is the most secure means for moving mouse strains from conventional facilities to specific pathogen-free facilities or as a solution to address disease outbreaks.

Current Projects

Currently, the BCF maintains 42 projects involving 30 different genetic strains of mice and supports the research operations of 17 UCSF laboratories. Projects range from providing simple hybrid mouse models for tissue transplants to complex multiple transgenic and knockout models. The BCF specializes in the production of immunocompromised models such as NSGs. Mouse models are provided to support disease-based research studies involving lung cancer, diabetes, leukemia and various important areas of research.

UCSF Laboratory Animal Resource Center (LARC)

Fees and Rates

A significant cost savings for the investigators, LARC and UCSF is realized through the BCF's careful adherence to aseptic techniques and rederivation services. In addition, by careful and calculated planning, unwanted rodent pathogens are eliminated and cage costs are reduced, saving investigators significant per diem costs. Investigators may utilize all BCF services by completing the request form available on RIO.

BCF Goals

The BCF seeks to:

- Reduce over-breeding and excessive per diem costs by maintaining well-calculated, managed and efficient mouse colonies
- Reduce laboratory costs associated with labor needed to maintain mouse colonies
- Free up post-doctorate researchers time for conducting research instead of maintaining mouse colonies
- Safeguard quality research models that are free of pathogens
- Provide a sterile, low-risk environment for maintaining immuno-compromised mouse models which are easily prone to infection
- Serve as a repository for commonly bred strains of mice available to UCSF researchers thus reducing the unnecessary need of managing separate colonies of same mice strains
- Provide and maintain an organized, online database that is easily accessible to researchers for the viewing of colony activities and inventories
- Offer an inexpensive rederivation service that performs embryo transfers for laboratories that want to generate reliably pathogen-free colony founders.

The BCF fulfills two important goals articulated by the Chancellor for assuring the long-term health of UCSF:

- The enhancement of **Discovery** through providing specific genetic strains of mice to the UCSF research enterprise.
- The BCF affords LARC technicians training and education in an ever-expanding field that will be highly valued by most vivariums. Through providing **Education** to our **People,** the BCF addresses the Chancellor's stated commitment to better educating our staff to meet the challenges that confront health serving institutions.

Current BCF Metrics

- BCF is providing breeding services to **17 UCSF research laboratories.**
- BCF currently maintains 30 different genetic strains.
- BCF currently manages **800 mouse cages.**

- BCF has had **0** pest-related outbreaks during FY 2012-2013.

Future BCF Metrics

- Expand the BCF to accommodate **3500 mouse cages**.

Super Barrier

The Super Barrier will allow investigators access to their mouse colonies which will be maintained at the same level of heightened procedure and excluded pathogen status as the BCF. Investigators will be able to work in the Super Barrier and will follow same SOP's as prescribed for the BCF.

BCF Achievements

In the spirit of true entrepreneurship and goal of achieving operational excellence, the Breeding Core Facility was conceived and implemented to provide the UCSF research and clinical enterprise a value added service that would reduce operational costs while simultaneously improving the quality and efficacy of research conducted at UCSF. The research community has warmly embraced and appreciated these services and have advocated for their expansion.