

February 18, 2015

CHANCELLOR LINDA P.B. KATEHI

Office of the Chancellor

Dear Chancellor Katehi,

Enclosed please find the Academic Senate Committee on Research Animal Subcommittee final report and recommendations. The report and recommendations have been unanimously endorsed by the Academic Senate Committee on Research (COR).

COR purposely focused on rodent-related research and support as it was deemed the most urgent issue. We recognize the campus needs to address overall animal care and support. As you will see, COR identified specific methods or best practices that could positively impact the overall problem.

The campus has devoted significant time and resources to evaluating and quantifying animal care and facilities needs and challenges. In fact, we believe there is another task force working on overall animal care issues right now. That these efforts have not led to action is the cause of considerable frustration within the faculty ranks. COR is providing the report and recommendations with the hope it will enable our campus to initiate decisive action to improve support for rodent-related research immediately.

We strongly urge the administration to work towards implementing the recommendations and involve the Academic Senate and expertise that exists within the faculty as needed. I look forward to discussing the report with you soon.

Sincerely,



André Knoesen, Chair
Davis Division of the Academic Senate
Professor: Electrical and Computer Engineering

Enclosure

c: Janet Foley, Chair, Committee on Research
Gina Anderson, Executive Director, Davis Division of the Academic Senate

February 17, 2015

Andrè Knoesen, Chair

Davis Division of the Academic Senate

Re: Committee on Research Animal Subcommittee Final Report

Dear Chair Knoesen,

Attached you will find the final report of the Animal Research Subcommittee of the Committee on Research. We have already submitted to you the Principles of Animal Research and here we submit our final overview of animal research issues and three very specific recommendations to address the concerns shared by the entire community of researchers. The Committee on Research has met, discussed this final report, and had the opportunity to provide feedback and address any concerns. As a result, the Committee strongly and unanimously endorses each of the recommendations and urges that all appropriate stakeholders work together to accomplish these recommended actions. Moreover, the committee urges prompt action. The current rodent research support is quite inadequate and that itself has a very high cost in terms of funds being used to shore up poorly supportable facilities, lost grant opportunities, and lost recruitment opportunities for faculty. There also is an opportunity, addressed in this report, to create better oversight of animal policies on campus if we work together on the Animal Oversight Committee recommended in this report. We hope that this product allows UC Davis to move quickly towards full implementation of these recommendations.

Sincerely,



Janet Foley, DVM, PhD
Professor, Vector-borne Disease Epidemiology
Chair, Committee on Research

Cc: Gina Anderson, Executive Director, Davis Division of the Academic Senate

**Report of the Academic Senate Committee
on Research**

Subcommittee on Animal Research

**Report Submitted to the
Academic Senate
February 17, 2015**

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Introduction

The Committee on Research established an animal subcommittee to review policies and pay structures regarding animal research at UC Davis. In follow-up discussions, the mission of the subcommittee was refined and specified. Following preliminary review of animal facilities and a faculty survey, the subcommittee established a list of principles to guide the development of a fair and effective animal use and care program at UC Davis. These guiding principles were provided to the administration on November 26, 2014.

As a follow-up to the guiding principles document, the subcommittee was then tasked to provide recommendations on how to improve the existing animal care and use program for rodents. Given that there already have been multiple reports by others over many years, in order to avoid undue repetition, we provide below a brief analysis of the current rodent-related issues at UC Davis, followed by a list of recommendations to ameliorate ongoing major deficiencies that have negatively impacted researchers at UC Davis for many years.

The most important request and recommendation from this subcommittee is that the leadership of UC Davis acts, and acts swiftly. Many of the below-listed deficiencies and challenges have been reported year after year. While some changes have taken place over the last few years, none have targeted the central issue facing faculty and students involved in rodent-related research: the inadequate infrastructure for rodent-related research on this campus.

It is our analysis and fervent belief, which is similar to previous reports, that without a bold decision by the leadership to invest in new central infrastructure, this campus will remain woefully unprepared for the expected 2020 expansion of the research labor-force and the infrastructure demands of a first-rate modern biomedical research campus. The continued running of UC Davis's aging, decentralized patchwork of rodent facilities as is will result in ever-expanding costs. Moreover, in the future, a smaller and smaller fraction of these expanding costs can be covered by direct extramural grant support.

The subcommittee is cognizant of the ongoing budget challenges and the trend of increased shifting of research support from the granting agencies to the Universities. We also understand the difficulties in attracting philanthropic giving for rodent research facilities. As we will outline below, however, we cannot envision a workable solution that does not include a significant investment of resources into what by all accounts is a crucial component of research in the biomedical and biological sciences. The long-standing under-investment in such facilities have been compounding the problem to a point where rapid action is required.

We hope that this brief report will be the final catalyst for action. Given the issues below, faculty support may not be uniform, as some have thus far been spared from

the high costs others at UC Davis have had to pay for rodent housing and care. We ask the administration to tackle these longstanding problems and to provide a unified approach to overcome the outlined challenges that are holding researchers and research at UC Davis back. While anecdotal at this point, we are aware of numerous instances where the recruitment of new faculty was hampered or indeed failed because of inadequate rodent research-related infrastructure and high per diem rates. We urge the administration to set UC Davis on a path for a successful future.

In our analysis, there are three major issues regarding the housing and care of rodents in research and teaching that require immediate action.

Issue 1: The infrastructure on the UC Davis and Sacramento Campuses is inadequate to support ongoing and future rodent-related research.

Research and animal housing of mice and rats (rodents) harbor unique challenges.

- 1) Requirement for tightly controlled environmental conditions. Rodents must be housed under highly controlled environments (temperature, humidity and light) and need specialized caging and rack systems with dedicated and complex airflow requirements that must comply with regulatory requirements. Because of the many regulations and experimental requirements, rodent housing and experimental procedure space must be specifically constructed. Furthermore, it is very difficult and costly to retrofit existing research lab space into rodent housing space.
- 2) Need to prevent accidental exposure to pathogens. The high-density housing made possible by the relatively small size of each animal and the inbred nature of commercially available mice and rats for research strongly enhances the likelihood of contamination with pathogens that can impair years of research. Some pathogens can survive in the environment for weeks and months and cause no overt signs of disease, but will affect the animals' immune systems and behavior. Preventing and monitoring microbial exposure are challenges to rodent research and housing, and require particular infrastructural considerations. For example, well laid out floor plans separating "clean" from "dirty" areas are absolute requirements that allow logical workflow patterns designed to reduce the risk of contamination. Strict physical separation of animal housing and procedural space for individual investigators and restricted access to the rodents by only well-trained staff, coupled with ongoing health surveillance efforts and frequent decontamination procedures, are the only means by which rodent research can be done efficiently and effectively.

Modern facilities provide a mix of “barrier-facilities” designed to protect the valuable mouse colonies from contamination and experimental mouse housing that allows access for experimental use. Depending on the type of research conducted and researcher’s needs, accessible housing might also include different levels of protection from pathogens and health surveillance. Sharing of procedural space by multiple research groups increases the likelihood of contamination with pathogens from rodents of other rooms/facilities and thus has to be avoided whenever possible. Yet, UC Davis investigators have few choices when it comes to rodent housing. Too many facilities have been built with inadequate rodent housing space on this campus over the last 20 years (e.g. [REDACTED], [REDACTED], and [REDACTED]). Access to rodent housing is increasingly limited, particularly for rats, and if available at all is often a drive away from an investigator’s laboratory and office space. Procedure space, if available at all, is nearly always shared and difficult to access due to time constraints, requiring movement of equipment back and forth between labs and animal facilities. This makes protection of rodents from contamination of pathogens in other investigators’ colonies all but impossible, and reduces productivity of the investigators.

Barrier housing is offered at UC Davis, both via TRACS (Teaching and Research Animal Care Services) and the [REDACTED]. This is very useful for investigators with breeding colonies of rodents that are unique and/or cannot easily be purchased. However, housing rodents in such facilities requires very expensive re-derivation of mice, costs that are borne entirely by the investigator. Further, “clean facilities” effectively bar investigators from working with the animals. Any procedures to be conducted on those mice must be conducted by dedicated staff employed by the facility, thus raising the cost of doing research since investigators must pay for these services. Although barrier-housing facilities are important, they serve only a small number of investigators on campus. Information provided to this subcommittee shows that the costs of maintaining mice in barrier facilities on campus and at the [REDACTED] are extremely high, and many investigators who need or want such facilities for their mouse colonies are unable to afford them. The recent MOU signed with The Jackson Laboratories to provide access to such barrier mouse housing is insufficient because it provides neither procedural space nor a cost-effective alternative option for mouse housing/breeding.

Due to the extreme constraint of adequate animal facilities at UC Davis, the campus has all but given up on avoiding contamination of mice with certain pathogens. For example, contamination with *Helicobacter* spp. and Norovirus is currently monitored, and it has been documented that most if not all facilities on campus are contaminated with both pathogens. Consequently, this campus effectively has no animal housing and procedure space accessible to investigators that is free of these known pathogens. This is a great problem for investigators studying immune and vaccine responses. In addition, there are no procedures in place to maintain investigator-accessible experimental facilities free of known pathogens, as staff often move from contaminated to non-contaminated areas in a given day. Immune-compromised mice are used routinely by numerous investigators, however, these mice are under constant threat of infection on this campus or in some instances cannot be used at all

because of the health status of the facilities. The available infrastructure precludes the use of known best practices to protect rodents from inadvertent infections.

Recent advances in research on the importance of the microbiome in health and disease represent an emerging area of research which UC Davis will have difficulty addressing. Over the last 5-10 years, the biomedical community has been made aware that the microbiome and commensal bacteria and viruses on all body surfaces of humans and animals have great influence on nearly every aspect of human health. Research efforts are ongoing at UC Davis into unraveling some of the basic biology of these effects as well as some clinical aspects, such as the effects of pre- and probiotics on human health. While many universities have responded to this important emerging new area of research with the set-up of gnotobiotic rodent facilities in which rodents can be raised either free of microbiota, or with highly standardized microbiota, no university-wide efforts are ongoing at Davis. A RISE proposal that proposed to set-up such a facility was not funded, leaving individual investigators to seek collaborations and opportunities at other universities, or investing heavily in time and money to set-up individual small facilities.

Recommendation #1:

- 1) Provide new and enhanced infrastructure for rodent facilities as a top priority on campus. Consistent with the recommendations of a 2010 White paper, entitled “Achieving Excellence in Management of Research and Teaching Animals at UC Davis”, which concluded the need for more centralized facilities to stream-line services and reduce costs, a new, state-of-the-art central rodent research facility must be built to accommodate the urgent need of existing faculty and students and the anticipated increase of rodent research as part of the 2020 initiative. In addition to the 2010 outlined deficiencies and challenges running the current decentralized animal housing units, UC Davis lacks sufficient rodent housing space overall.

Building such a facility would be expected to save money in the long-term. A current plan before the administration is for the building of a \$29 million cage-wash and administrative complex. Instead a larger facility that incorporates the need for modern cage washing equipment and space and also provides rodent housing and procedural space should be considered, as it is likely to maximize long-term cost savings. It would reduce staff and energy costs and costs associated with transportation of (potentially contaminated) cages across Davis. Such a facility should include also space for the [REDACTED] avoiding the current rent (and ongoing investments) paid for the [REDACTED]. It would also bring the [REDACTED] into the University, in vicinity to its faculty and thereby increase potential collaborations and funding opportunities. It is difficult to see how any cost-effective long-term plan could exclude such a dedicated facility. While the “sticker-shock” for such a facility might be high, the expected long-term savings are considerable.

- 2) In the interim, develop and fund a comprehensive plan to overhaul existing rodent space. Improved access to and the development of dedicated “clean” but investigator-accessible housing and procedure space for mice and rats must be a top priority. Investments into modern rodent housing rack systems that increase the capacity per room and provide filtered air to animals should be evaluated and implemented whenever the existing infrastructure allows.
- 3) Insure that adequate animal housing space is incorporated into every biological research facility newly built on this campus, as retrofitting of lab space after the fact is extremely expensive and difficult.
- 4) Identify dedicated procedure space within or immediately adjacent to animal housing space that allows each investigator to set-up their research tools free of fear of contamination by others and enhancing effectiveness of each research unit.
- 5) Make the eradication of known pathogens on the UC Davis and Sacramento campus (such as Norovirus and *Helicobacter* spp.) a long-term goal.

Issue 2: The costs of housing and care for rodents are not transparent, vary greatly by School/College and are becoming unaffordable for many.

UC Davis has a highly decentralized animal management structure. Multiple reports over the years identified this as a top challenge, as it compounds the cost of running an animal husbandry program. With respect to rodents, the primary husbandry unit on campus is TRACS. [REDACTED], and the Departments of Nutrition, Animal Science, and Psychology each run additional rodent facilities independent of TRACS. A consequence of the decentralized management structure is a per diem rate structure that greatly differs among the various facilities. The reasons for the different rate structures are unclear but may derive at least in part from differences in labor costs associated with the changing and washing of animal cages at each of these facilities and/or in the way in which each Dean is able to use other funds to subsidize the costs. We were unable to analyze the exact costs associated with the running of each facility or the calculations used to derive the per diem rates, but the differences in the final rates are astonishing.

For example, Table 1 compares the per diem rates for mice and rats at TRACS versus the Department of Nutrition.

Table 1:

Animal	Type	Rate per cage or animal	Facility
Rat	Full Care	\$0.82 per animal	TRACS
Rat	Full Care	\$0.45 per cage (2-3 rats)	Nutrition
Mouse	1-4 conventional	\$0.74 per cage	TRACS
Mouse	1-4 Barrier	\$0.94 per cage	TRACS
Mouse	1-4 conventional	\$0.35 per cage	Nutrition

As can be seen, for mice there is a 2-3 fold difference in direct costs to the investigator depending on whether they are a principle investigator in Nutrition or in a department that utilizes facilities run by TRACS. In the case of research involving rats, the direct cost differential is 4-6 fold. This variable rate structure creates clear research advantages for select faculty and students on campus.

These large differences in per diem rates, all within the same Campus, raise numerous issues including: 1) what are the actual costs of running each facility and to what extent do subsidies provided by individual units decrease the rates charged to the investigators, and 2) what costs are shared across campus or across units. Moreover, these variable rates within a single campus raise issues regarding the effective use of grant dollars, fairness between investigators working on the same campus, and the ability of faculty in some school and colleges to remain competitive.

Recommendation #2:

- 1) Develop and implement a single uniform per diem rate-structure across campus. An independent outside entity (offered through AAALAC) should assess such rates. The new rates must be transparent, fair, affordable and comparable with other peer institutions, such as our sister campus at Berkeley, where current (subsidized) per diem rates for mice are just over half compared to that charged by TRACS. This rate structure should be inclusive of all costs and should avoid extra charges, such as “first-day rates” and additional costs for health surveillance (see #6 below).

The physically and managerially decentralized rodent animal care and use program at UC Davis may further compound already high costs for running a rodent use and care program. However, these are indirect infrastructure costs, which should not be borne by direct grant support. Consistent with many other core research service units on campus, central subsidies will likely have to be provided to ensure that all faculty at Davis have the same chance of remaining competitive.

- 2) Given that rodent-housing rates are highly variable across campus and considerably cheaper for certain faculty, the administration should conduct a thorough analysis and comparison of the costs associated with running TRACS (which has continuously rising costs and rates) and the other independent facilities, especially CAES/ Nutrition and Animal Science and L&S/Psychology. Such an analysis could help to identify the reasons for the large differences in costs required to run each of the facilities, and could identify cost-savings measures that could be implemented by TRACS to benefit all campus faculty.
- 3) At the time a successful research grant is awarded, the University must freeze the rodent housing charges for that grant period, or use an inflationary factor to be calculated and included in the grant budget prior to grant submission. Currently, funded investigators are finding themselves in a position where they are unable to complete their proposed research, because of unexpected increases in rates that were not budgeted in the grant submission. Such procedures are in place already for primate-related research and should be adopted for all rodent (animal) research on the campus.
- 4) Ensure that all facilities on campus that serve UC Davis faculty abide by the standardized costs established across campus. The rules under #3 should apply also to the [REDACTED] with respect to services used by Davis faculty. The [REDACTED] runs a very good, albeit very expensive, barrier unit for the University. Because the [REDACTED] functions as an independent unit that must “break even”, in the past they have raised rates with considerable impacts on investigators serviced at UC Davis. For example, in January of 2013, per-diem costs for barrier housing increased by 95% and investigators were given only 2 week’s notice, forcing some investigators to choose between paying these increased costs or taking their rodents out of the barrier thus forfeiting the money spent on rederivation of the mice.
- 5) TRACS per-diem rates should be adjusted lower in those Departments and Centers who have made capital investments. To increase mouse-housing density, and thus increase revenue for TRACS, some investigators, or their departments and centers, have bought their own racks and cages. However, per diem rates have not been adjusted down to reflect these cost-savings to the University. If the University requires and/or supports the purchasing of caging systems by Departments and Centers, then they must develop rate-structures to encourage such investments.
- 6) Rodent health surveillance costs should be supported by the campus as a necessary routine expense required for the running of a modern rodent-research unit. While a recent NIH-directive has made a case for such costs to be direct costs, it is our view that these costs should be borne by the University and not be billed directly to the investigators, as this is a necessary cost associated with rodent-related research. The separation of these costs from the per-diem rates, which was implemented about 2 years ago on campus, but billed after an unconscionable 18 month delay to the investigators, has led to a “hidden” per-diem rate increase.

Issue 3: The oversight and decision-making processes to deal with animal-related research at UC Davis are fragmented.

At UC Davis, the Office of Research has the oversight of research funding, yet has no authority over animal space, has little knowledge of what the campus can support, and cannot accommodate the needs of investigators once funding has been obtained. Deans sign-off on grant proposals, but not all Deans have rodent housing space that they are authorized to assign to the researchers (for example the Dean of CBS). At UC Davis, but not on any other UC Campus, administration of the Animal Care and Use Program falls under the authority of the Senior Executive Vice Chancellor of Campus Planning, Facilities, and Safety Services. Since Jan 2013, the animal husbandry component of the program, TRACS, is run through Safety Services and the Attending Veterinarian.

The Attending Veterinarian is in charge of animal research on campus, however, the oversight of animal research space, housing and care are organized differently across colleges and research units and even at the level of the individual investigator. Because of a lack of centralized oversight, IACUC seems to have taken on increasing responsibility, such as space assignments, that are not, and should not be its responsibility. Overall, the existing structure administering access to, maintenance of, and support for rodent housing space and research infrastructure at Davis is highly fragmented and appears inadequate for the increasing demands of animal research.

Modern animal housing and research facilities are a central component of any biomedical and biological research program that cannot, or not effectively, be run individually by each unit of the university. Recently, the UC Davis Core Research Facilities and Resources Report defined a “Core” as “an organized shared resource that provides access to technologies, equipment and expert consultation, often on a fee or reimbursement basis, to enable, facilitate, or enhance the research mission of the university”. Animal husbandry facilities meet this definition. Many of the observations and recommendations outlined by that report are relevant to the Animal Care and Use Program. Thus, animal facilities and services are a vital Core at UC Davis.

Recommendation #3:

- 1) Consistent with the administrative structure on most other campuses, including all other UC campuses and the acknowledgement that Animal Services are a vital Core for research on the campus, the institutional oversight for the UC Davis Animal Care and Research Core should rest with the Office of the Vice Chancellor for Research. The Office of the Vice Chancellor for Research is the logical home for the Animal Care and Research Core as this office is currently the administrative home for human research and for the National Primate Research Center. The Attending Veterinarian, IACUC, and a joint oversight committee with strong faculty representation should report to

the Vice Chancellor for Research. The Attending Veterinarian would retain oversight of all animal veterinary care, IACUC will continue to be responsible for overseeing the rules and regulations governing the use of animals in research and teaching, but all other responsibilities, detailed below, would fall to a newly developed oversight committee. The funding provided by the Provost for the TRACS veterinary services and IACUC administration should be maintained and allocated to the Office of Research. Given the need for new infrastructure and ongoing need for maintenance/repair of current facilities it is recommended that the Office of Research consult and work closely with Budget and Institutional Analysis and the Office of Campus Planning, Facilities, and Safety Services.

- 2) Develop an animal use oversight committee, which would advise on faculty and student needs and develop policies guiding the assignment of space and ensure interactions and communication of any changes to procedures and policies with faculty. Faculty representatives from the Academic Senate and Academic Federation should be appointed by respective Committee on Committees and would work with administration representatives on this committee. The animal use oversight committee should regularly report to the respective Committees on Research.

In summary, there are three major issues regarding the housing and care of rodents in research and teaching at UC Davis that we believe require immediate action. As outlined above, there are no easy or “cheap” solutions, because these are long-standing issues that have not been tackled comprehensively. Addressing one of the major issues, without also tackling the others, is unlikely to have a significant impact on the quality or affordability of our animal use and care program. We are encouraged by the administration’s attention to this issue and hope that this report will inspire immediate action given the vital function of the Animal Research Program for this campus.

Academic Senate Committee on Research - Animal Research Subcommittee Membership

Sue Bodine, Chair

Professor

Neurobiology, Physiology and Behavior

SOM: Physiology and Membrane Biology

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