Agenda Board of Regents Emergency Meeting of the Facilities and Land Management Committee December 11, 2003; 3:00 p.m. – 4:00 p.m.

VIA VIDEOCONFERENCE/AUDIOCONFERENCE

Committee Members:

Elsa Froehlich Demeksa, Committee Chair Michael J. Burns Kevin O. Meyers

Michael Snowden Joseph E. Usibelli, Jr. Brian D. Rogers, Board Chair

I. <u>Call to Order</u>

II. Adoption of Agenda

MOTION

"The Facilities and Land Management Committee adopts the agenda as presented.

- I. Call to Order
- II. Adoption of Agenda
- III. Revised Project Approval for UAF's Biological and Computational Sciences Facility (BiCS) Central Animal Facility (CAF) and State Virology Lab
- IV. Adjourn

This motion is effective December 11, 2003."

III. <u>Revised Project Approval for UAF's Biological and Computational Sciences</u> <u>Facility (BiCS) Central Animal Facility (CAF) and State Virology Lab</u> References 1-5

A HISTORY and BACKGROUND statement is provided in Reference 1.

SITE

The preferred site for BiCS-CAF is the Facilities Warehouse Compound located north of the existing UA Museum along Sheenjek Drive (previous USGS warehouse site). This site is more appropriate for an incineration function with fewer potential conflicts with adjacent facilities. Geotechnical exploration is being conducted, as are discussions to relocate and/or demolish the existing warehouses.

PROJECT SCOPE

The proposed BiCS–CAF project consists of a first floor housing animal quarters, veterinary space, necropsy and incinerator, as well as a teaching laboratory. The basement would have mechanical/electrical components, and space for additional animal quarters.

Construction estimates indicate that the \$14.25 million from the FY02 GO bond will not complete all UAF areas of the BiCS–CAF facility. The administration proposes deleting State Virology from current design efforts and proceeding with schematic design for approximately 42,000 square feet; approximately 50 percent of the space will remain unfinished until funding is secured. It is estimated that a completely finished facility would add \$3.65 million, for a total project cost of \$17.9 million total.

Additional detail is provided in:

Reference 2 – Facilities Anticipated Questions

Reference 3 – Animal Care Facility Components

Reference 4 – Floor Plans

Reference 5 – Capital Funding Options to Complete the Project

CONSULTANT

Utilizing the formal UAF consultant selection process, Bezek Durst Seiser was selected to prepare a program and concept study for BiCS and continues to develop design and bid documents for the BiCS-CAF.

FUNDING

\$ 7,100,000	West Ridge Utilidor
150,000	Temporary parking lot
14,250,000	Available for BiCS–CAF
\$21,500,000	Total FY02 GO BOND
400,000	Series I Bonds dedicated to Utilidor
\$21,900,000	Total Available Funding

SCHEDULE

Project Approval	September 2003
Revised Project Approval	December 2003
Schematic Approval	February 2004
Award Construction Contract	April 2004
Construction Complete	September 2005

Regents' Policy 05.12.04.C requires that a Project with an estimated Total Project Cost of in excess of \$4.0 million be approved by the Board based on recommendations from the Facilities and Land Management Committee. Unless there is a material change in scope or budget of a Project, Regents' Policy 05.12.04.D provides that the Facilities and Land Management Committee approves Schematic Designs of projects in excess of \$4.0 million.

The administration has determined that there is a material change in scope (35 percent versus 50 percent of space to be unfinished) and related budget for the completed Project that was approved by the Board of Regents in September, and that the most appropriate solution is to have the Committee review and recommend to the full Board of Regents a Revised Project.

The President recommends that:

MOTION

"As required by Regents' Policy 05.12.04C., the Facilities and Land Management Committee recommends that the Board of Regents (1) approve the <u>Revised</u> UAF Biological and Computational Sciences Facility Central Animal Facility (BiCS-CAF) Project as presented, (2) authorize the University administration to proceed with the complete design and development of schematics for a total project cost not to exceed \$17.9 million provided however that no more than \$14.25 million shall be encumbered without advance approval by the vice president for finance and (3) authorize the vice president for finance to authorize encumbrances utilizing funding sources as determined by the vice president for finance, up to total project cost of \$17.9 million, to complete the unfinished portions of the Project. This motion is effective December 11, 2003."

IV. <u>Adjourn</u>

REFERENCE 1

HISTORY and BACKGROUND

In February 2003, the regents approved the UAF Biological and Computational Sciences Facility design project in the amount of \$1.5 million.

In April 2003, UAF presented Scenario A and Scenario B to the regents for consideration as two options for the design and construction of this project. Scenario A would have built a "plywood" shell of the entire 155,000 sf facility with existing funds while Scenario B would have initially built the finish quality exterior with glass on a 75,000 sf shell. The Board of Regents' Facilities and Land Management Committee directed the administration to proceed with Scenario B. Under Scenario B, each segment (research, teaching, animals, ARSC, and Virology) was to be completed as future funding allows either through build-out of a previously constructed shell or through additional construction. The committee also indicated its preference for a lower profile building that should be shifted to the East towards the Arctic Health Building, and analysis regarding demolishing the west wing section of the Arctic Health Building.

In June 2003, UAF briefed the regents on the status of the programming efforts for BiCS and discussed the option of construction a Central Animal Facility (CAF) as the first segment of the BiCS facility. The regents were generally in favor of the approach and advised UAF to proceed with the program development. The BiCS–CAF project would include the initial planning, but not design, for BiCS-Research at the original site west of Arctic Health.

On September 18, 2003 the Board of Regents approved the UAF Biological and Computational Sciences Facility Central Animal Facility (BiCS-CAF) Project and authorizes the University administration to proceed with the complete design and development of schematics, subject to receipt of a satisfactory Project Agreement, for a total project cost not to exceed \$14,250,000. The project was estimated to be approximately 41,920 square feet; 35% of which would be unfinished.

REFERENCE 2 – Facilities Anticipated Questions

BiCS Central Animal Facility (CAF) FAQs (Facilities Anticipated Questions)

The proposed Biological and Computational Sciences Facility (BiCS) included research animal quarters. What is the rationale for constructing a separate Central Animal Facility (CAF) for research animals?

Recent BiCS planning work to provide options for constructing the project in segments to accommodate incremental capital funding and planning to re-site the proposed facility identified a priority to accommodate research animals for current grants and new biological research investigators. Phasing the build-out of BiCS as it was currently programmed and the current available capital funds could not readily accommodate this priority. Also, replacing outmoded animal care and necropsy and incinerator facilities in the Arctic Health Research Building (AHRB) needs to be addressed in the next 1 to 3 years.

The BiCS facility design committee determined that a stand-alone animal care facility to support research activities in BiCS as well as other campus wide users should be constructed if:

- It could be built at a lower cost /SF than projected for the BiCS facility.
- It could be built using currently available BiCS funding (\$14.25 million). If initial funding is not adequate for full build-out of the facility, the scope of the initial build must include critical components to facilitate a significant improvement in current research animal holding capacity and capabilities at UAF and complete enough to attract viable grant funding for incremental build out.
- It could be located in close proximity to facilities that currently house research activities that utilize lab research animals.

What are some advantages to having a centralized animal facility versus an animal component in BiCS?

A centralized animal facility is a vast improvement over the animal component originally programmed in BiCS both functionally and operationally.

The facility design committee looked at the operational impacts of having the research animal housing separated from the research labs. They believe that centralization of research animal care on campus would provide opportunities to better manage appropriate animal care protocol and should reduce redundant investment in support equipment and provide opportunities to maximize holding room utilization and staffing efficiencies. A separate animal care facility can also be designed to more readily expand to house additional animals at a lower construction cost, than adding space to the BiCS in the future.

The BiCS/CAF design committee wants the facility to include modern necropsy, diagnostics and pathology waste disposal (incineration) functions as this would efficiently utilize staff resources and locate these functions in a more appropriate setting with less potential for cross contamination than in the current facility (AHRB).

Depending on the option selected and the programs the option accommodates, the completion of a new BiCS/CAF will provide the opportunity to reassign vacated space in AHRB to accommodate other activities.

Why has the programmed animal component in the original BiCS concept increased in size and scope in the new BiCS/CAF version?

The programmed animal component in BiCS was designed to be used in conjunction with the existing animal component in the adjacent Arctic Health Research Building (AHRB). The preferred 42,000gsf BiCS/Central Animal Facility includes space for relocating those functions currently located in AHRB; specifically the incinerator, necropsy, diagnostic labs, and animal holding quarters which are or will be obsolete in the next few years.

A recent study to construct a separate incinerator/necropsy building was estimated at \$5.8 million. Inclusion of these functions in BiCS/CAF can be achieved more economically and be operated more efficiently with current staff.

What are the advantages to constructing BiCS/CAF with some space "unfinished" versus constructing a smaller but "complete" facility?

The 42,000gsf facility meets the long term goals and objectives of the animal care research program, would enhance the ability to attract top researchers, help obtain government funded research grants, provides proper containment zones through the use of a double corridor system, provides vacated space in AHRB that could be better utilized for other functions and facilitates desired relocation of the incinerator/necropsy function.

The 32,000gsf scheme compromises the animal care program operationally by having animals located in three separate buildings (CAF,



AHRB, Irving), does not accommodate relocation of incinerator/necropsy functions, does not provide proper containment zones due to the single corridor concept and is less suited to potential expansion plans.

Estimates based on the 42,000gsf schematic design indicate current available funds would allow completion of a portion of the animal holding suites and support spaces (see drawings). The initial construction will provide an operational facility that could be completed on an incremental basis.

How does the efficiency of program square footage in BiCS/CAF compare to the original BiCS program?

The BiCS/CAF efficiency factor will be slightly lower than that of BiCS because the smaller facilities include a higher ratio of un-assigned utility and mechanical space compared to the overall building size. A standalone animal facility is overall more service intensive than a larger, multifunction science building. In addition, this building must provide 100% on-site heat generation capability (boilers), this became necessary when a central heating/cooling plant was not constructed. Also, the larger size of the original BiCS facility allowed for a self-contained corridor system dedicated to animal care, which enhances security and care protocols and therefore is included in the program square footage. The smaller facilities must share some of the corridor with other assigned and unassigned functions. The shared use corridors are not included in the assigned square footage, thus lowering the PSF to GSF factor.

We anticipate the BiCS/CAF efficiency to be in the range of 55 percent to 62 percent, which is comparable to similar animal research facilities. The efficiency calculation will be done initially at the time of schematic designs. There are literally no "general use" areas in this concept (public lobbies) and will strive for the highest efficiency design possible.

What potential funding sources are available to complete the "unfinished" space in the preferred 42,000gsf option?

The potential to secure "outside" funds to complete the "unfinished" space for this facility is very promising. Funding for animal research is available and this new state-of-the-art facility is a good candidate to receive funds needed to complete the building and/or purchase equipment.

Specifically, the National Institute of Health (NIH) CO6 grant could provide up to \$4 million in funds to complete "shell space." UAF has recently received NIH grants for lab renovations and are encouraged by the director of the program to continue applying.



obtaining these grants for several years.

What other anticipated costs impact the construction of the BiCS/CAF regardless of the option?

The Murdoch Foundation provides grants on a yearly basis in the range

of \$200,000 to \$500,000. The University has been successful in

The preferred site north of the Museum has poor soil conditions. Anticipated excavation depths of 20 to 25 feet will add to site development costs.

Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) certification necessary to obtain government research grants requires "redundant" mechanical systems to protect the animals. In the event of equipment failure, dedicated "redundant" air handler, boiler, etc. need to be provided in the initial phase of construction.

The escalation of bidding costs in Fairbanks is difficult to estimate, but there remains a limited number within the construction workforce that is pushing prices up. Increases in the amount of new construction in the state over the next several years makes for a less-competitive bidding climate and increases bids in the range of 10 percent to 30 percent. We have been experiencing an escalation of prices in the range of 13%

How does each of the 4 options impact staffing requirements?

The Veterinary Care staff currently is comprised of 4 individuals with multiple assignments and duties, supported by animal care taking staff positions. Construction of a smaller facility (Options A or C) would increase fragmentation of current programs and staff duties between several facilities. To accommodate this would require additional staffing or curtailment of current services. The larger facilities (Option B & Initial Concept) would consolidate services and animal holdings (as well as increasing holding capacity) in fewer facilities, which should improve staff utilization and minimize demand for additional.

Will the new BiCS Facility include animal care facilities if the CAF is built?

The construction of the BiCS/CAF would eliminate the need for animal care facilities in BiCS based on the current facility program.



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What is the status of the current animal facility program and incinerator/diagnostic facilities in AHRB and how can this space be utilized if vacated?

The Experimental Animal Facility located in the southwest corner of the Arctic Health Research Building (AHRB) was designed in mid-1960, long before the major revisions to the Animal Welfare Regulations (1985) and the creation of the Health Research Extension Act. The existing facility has serious cross contamination problems, poor HVAC, inefficient animal holding rooms, a lack of procedure rooms, and seriously deficient cage wash capacity. Moreover, this facility was designed prior to the federal requirement of ensuring an adequate veterinary care program; therefore, except for relatively recent adaptation of research support space and hazmat disposal (i.e. incinerator), diagnostic, clinical and surgical space were never part of the original design. Renovation of this facility to try and accommodate current animal research needs is anticipated to cost as much if not more than new construction with the added issue that the existing building cannot accommodate the necessary mechanical space to meet the needs of a modern animal facility.

If these functions are relocated to the new 42,000gsf BiCS/CAF, approximately 15,000gsf will be available to be reassigned in AHRB. Potential use of this space includes offices, labs and research storage, uses that are far less mechanically intensive.

What is the size and cost for the proposed BiCS/CAF?

Four options have been developed for BiCS/CAF, from 32,900gsf, to 49,700 gsf with progressively larger capacity for animal holding and more program delivery components. All 4 scenarios include similar modest site improvements.

- Scenario A "Rectangle" 36,000 GSF \$17.9M TPC This concept is a smaller laboratory animal holding facility with the holding capacity as originally proposed in BiCS, animal care administration and includes necropsy, diagnostics, and incineration functions (currently housed in AHRB). This concept poses functional compromises for animal care as there is only one corridor and therefore minimal separation between conventional and barrier suites and necropsy functions. The separation is so critical to meeting contemporary requirements that this version was eliminated from further consideration.
- **Option B "Square" 42,000 GSF**. \$17.9M TPC **RECOMMENDED** This concept is a laboratory animal holding facility with the holding

capacity as originally proposed in BiCS –including a barrier suite, animal care administration, and slightly expanded necropsy, diagnostics and incineration functions. This facility has a dual corridor system that can adequately serve both barrier and conventional holding environments. This option would have more robust capability to support further expansion of the holding capacity because of the dual corridor configuration. There would not be any undergraduate instruction program space in this facility model.

The current available project funds would allow initial completion of a portion of the animal holding suites and support spaces. The remaining 50% of the assigned space would be left as shelled out space and remain unfinished. The remaining space could be completed on an incremental basis. To complete the remaining areas would require at least \$3.65 million (project cost), assuming the additional construction was completed by 2006.

Option C "Rectangle" – 32,960 GSF. \$14.55M TPC This concept is a basic laboratory animal holding and animal care administration facility with the holding capacity as originally proposed in BICS. It does not accommodate necropsy, diagnostics, and incineration functions (currently housed in AHRB). There would not be any undergraduate instruction program space in this basic facility model. This concept has the functional compromise of animal care distributed on both floors. The separation between conventional and barrier animals is accommodated by locating the barrier at one end of the lower floor.

The current available project funds (\$14.25 Million) should allow initial completion of this facility based on preliminary cost projections. The Surgery suite is the likely shelled area if further development of design and engineering indicates budget shortfalls. This function can be maintained in AHRB until additional funds are available. <u>An additional \$300,000 (project cost) would be required to assure full completion of all components of Option C.</u>

• Initial Concept - 49,700 GSF. \$19.9M TPC This concept is a laboratory animal holding facility with the holding capacity as originally proposed in BICS –including a barrier suite, plus additional holding capacity to replace current AHRB holding capacity and animal administration space and necropsy, diagnostics and incineration functions. The facility would also provide segregated undergraduate biology instruction and public use program space in this option. This facility would have more robust capability to support



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further expansion of the holding capacity due to the dual corridor configuration.

The current available project funds cannot complete any of the facility for immediate occupancy; the building would be a heated shell, ready for future improvements. The assigned space would be unfinished with build-out completed on an incremental basis. The cost increment for the first build-out would be substantial, to complete necessary HVAC infrastructure connections and architectural components. To complete the remaining areas would require an additional \$5.7 million (project cost), assuming the additional construction was completed by 2006.

Is the construction costs (\$/SF) lower for CAF than BICS?

The size and program complexity of the proposed BICS facility and its more prominent location on campus require a more "premium" priced

solution to building systems, public areas and finishes than a facility which will be dedicated to housing research animals and support staff. Since the CAF is not located in a prominent location, the buildings finishes and site amenities will be more modest without detracting from the appearance and functionality of the campus.

BICS CAF Facts

Current Available Project Funds: \$14.25 Million

Proposed Sche	dule:
Design:	September 2003 – April 2004
Bidding:	May 2004 (possible early site & foundation package)
Construction:	June 2004 – September 2005
Occupancy:	November 2005



BICS CAF Program Comparisons – using program square feet (PSF) of program space (includes corridors used only for animal holding)

Facility Description	Size	Animal Holding & Procedures	Surgery	Animal Support	Holding Support Corridor	Necropsy & Incinerator	Facility Management & Instruction	Biology Teaching & Prep Lab	Total Project Cost (Year 2004)
BICS 2002 Program	14,385 PSF	4,260 PSF	1,685 PSF	4,570 PSF	3,600 PSF	NIC	270 PSF (use AHRB)	Located elsewhere in BICS	N/A – large bldg.
Option A Rectangle 36,000 GSF			This	option not	considered viable	e for UAF prograi	ns		
Option B Square 42,000 GSF	20,552 PSF no public lobby	7,598 PSF (two corridors)	1,492 PSF (no large animals)	4,186 PSF	3,196 PSF	3,180 PSF replace AHRB facilities (RT-PCR only)	900 PSF (no microscope rm.)	0 PSF (locate in BICS)	\$17.9 M
Option C Rectangle 32,960 GSF	16,151 PSF no public lobby	8,820 PSF (one corridor)	1,492 PSF (no large animals)	3,586 PSF	1,653 PSF	No Necropsy Suite or Incinerator	600 PSF (no microscope rm.)	0 PSF (locate in BICS)	\$14.55 M
Initial Concept 49,700 GSF	28,000 PSF public lobby	10,270 PSF replace AHRB space two corridors	1,794 PSF (accommo date large animals)	5,394 PSF	3,430 PSF	4,756 PSF replace AHRB facilities (with full PCR Suite)	1,068 PSF replace AHRB (with microscope rm.)	1,288 PSF utilize Animal Support	\$19.9 .M
Existing AHRB	15,628	5,956 includes ST/AK Virology Lab	345	3,296 includes mech penthouse	3,789	1,662	580	0	

Blue indicates program square footage (PSF) of program space that would be unfinished based on current available funding (\$14.25 M) Green indicates program square footage (PSF) of program space that would be partially finished based on current available funding (\$14.25 M)



REFERENCE 3 – Animal Care Facility Components

UAF Animal Care Facility Options & Current Situation Comparisons

BiCS CAF Facility Components	Option B - 42,000 GSF <i>\$17.9 M completed</i>	Option C – 32,900 GSF <i>\$14.55 M completed</i>	Existing Situation (@ AHRB)
Animal Holding & Procedures Small Research Animal Holding Barrier Facility	 8,998 GSF of Animal Holding, Prep and support space 28 Animal Holding Rooms, large & small. Necropsy / Diagnostics and Incineration co-located on site Separate Barrier Suite Corridor Animal holding consolidated on one level – for optimum operational efficiency and security Accommodates Necropsy and Incinerations functions on site to better utilize current staffing. Dual corridors accommodate sequential build out and future expansion with minimal impact on current operations More space for building systems access and future modifications 	 9,320 GSF of Animal Holding, Prep and support space 28 Animal Holding Rooms, large & small. Necropsy / Diagnostics and Incineration remain dispersed in AHRB Barrier Suite at end of single corridor 5% larger Animal holding space than Option B, but dispersed on two levels- reducing operational efficiency and security Single corridor does not accommodate sequential build out and future expansion without significant impact on current operations Limited space for building systems access and future modifications 	Over 4,000 GSF of animal holding space, with limited functionality as some of it was designed to hold large wild mammals, or for project specific research requirements or is marginally usable due to adjacent activities or systems Functions commingled with other animal care functions. 30-year-old facility was designed for significantly different requirements and is not to contemporary standards
Animal Surgery Surgery Pharmacy Imaging / Diagnostics	 1,492 GSF of Animal Surgery and support space Dual Corridor isolates function from other activities 	 1,492 GSF of Animal Surgery and support space Common Corridor exposes surgery suite to other activities 	<1,000 GSF of Surgery functions commingled with other animal holding functions. 30-year-old facility was designed for significantly different requirements and is not to contemporary standards.

UAF Animal Care Facility Options & Current Situation Comparisons (continued)

BiCS CAF Facility Components	Option B - 42,000 GSF <i>\$17.9 M completed</i>	Option C – 32,900 GSF \$14.55 M completed	Existing Situation (@ AHRB)
Animal Support Cage / Rack Wash Supplies Laundry Receiving Quarantine Rooms	 4,186 GSF of Animal Support and Housekeeping space. Dual corridors large spaces and central location of services on same floor as holding readily accommodate facility expansion or research demands. 	 3,586 GSF of Animal Support and Housekeeping space. Single Corridor, smaller spaces and location of holding on two floors is not functionally responsive to major facility expansion or research demands 	Current Animal Support and Housekeeping space and major equipment is 30 years old and commingled with other support or holding functions. Current facilities cannot efficiently accommodate holding expansion or certification protocol requirements.
Support Offices & Training Veterinarian's Office Manager's Office Technician Work Stations	 900 GSF of discrete Animal Management space Visitor Lobby and additional staff work space 	 600 GSF of discrete Animal Care Management space Limited staff and visitor accommodation. 	Current equivalent program space is estimated at about <600 GSF, commingled and dispersed with other animal support or holding functions or unrelated research activities.
Animal Necropsy & Incineration Necropsy Necropsy Diagnostics Incineration	 3,180 GSF of Animal Necropsy, Diagnostics and Animal Incineration Space Necropsy and Incineration are isolated from adjacent activities 	 <u>0</u> GSF of Animal Necropsy, Diagnostics and Animal Incineration space in this facility due to size. Necropsy and Incinerations functions off site requiring additional staffing. 	Necropsy, Diagnostics and Incineration functions dispersed and commingled with other activities, creating management protocol, code compliance and facility certification challenges. 28 year-old Incinerator emissions are not desired in close proximity with West Ridge facilities. Relocating Necropsy, Diagnostics and Incineration functions to a stand-alone facility on the West Ridge would incur +\$500,000 in site development costs

Version 1.1 BDS 12.08.03

REFERENCE 4 – Floor Plans



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SLN

Ground Level Plan Dec 3, 2003

University of Alaska Fairbanks BICS/Central Animal Facility



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Lower Level Plan Dec 3, 2003





REFERENCE 5 – Capital Funding Options to Complete the Project

Funding Opportunities for Completion of Shell Space

Note: May 13 and 14, 2004 UAF is hosting a two-day NIH and NSF funded educational program on the care and use of animals in research. This meeting will have attendees from Animal Care, USDA, Office of Laboratory Animal Welfare, AAALAC International, USGS, USF&WS, NMFS, as well as IACUC 101 faculty who represent other institutions and funding organizations (e.g. DARPA). Our ability to get this program here was solely dependent upon the national respect given to this institution's Animal Care Program. Although well written and well supported proposals are a must for successful funding, recognition such as this helps us document the quality of our current program and will be extremely helpful in our funding requests, particularly to NIH and NSF.

USDA:

Agricultural Research Services

NIH:

Research Facilities Improvement Program (C06 Process)

- we have good working experience with this program and have a clear understanding of their expectations
- \$120 million with 34% of proposals funding during last federal fiscal year
- up to 4 million request with 1:1 match
- completion of shell space or augmenting new construction is preferred.

Animal Facilities Improvement Program (G20 Process)

- 700, 000 request with no match required
- focus is on equipment

NSF:

Division of Biological Infrastructure

- Instrument Related Activities (equipment)
- Research Resources (support of "living stock" collections)

USDA:

Homeland Security

- National Animal Health Laboratory Network
- Veterinary Services, APHIS, USDA with funding through CSREES
- \$100 million to enhance animal diagnostic capacity in all 50 states
- completion of shell space, laboratory renovation but not new construction

DARPA:

- strong interest in our hibernation research
- does not wish to fund "bricks and mortar"
- will assist in renovation or completion of shell space

Funding Opportunities for Completion of Shell Space

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Foundations:

Murdock

- \$500,000 per year for major equipment or renovations that build research infrastructure
- requires a focused proposal from the university
- consider approaching foundation for a larger one time grant

Keck

Investigator Initiated Proposals:

- many allow opportunities for renovation and equipment
- animal per diem rates
- cannot fund new construction