College of Veterinary Medicine – University of Missouri
CVM Office of Research

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CVM Office of Research

**Internal peer review process available**
- All aspects of grants can be reviewed
- Please touch base early (or as early as possible)

**Full service grant resource**
- Proposal management and organization
- Research proposal development
- Budget development
- Proposal submission
- Or anything that you really HATE that we can help with (grant-wise)

**Internal grant programs**
- Clinician Scientist Grants
- Faculty Research Grants
  - All CVM faculty eligible
CVM Expenditures: A lagging indicator

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Expenditures</th>
</tr>
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<tbody>
<tr>
<td>FY09</td>
<td>$15,604,458</td>
</tr>
<tr>
<td>FY10</td>
<td>$14,607,871</td>
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<tr>
<td>FY11</td>
<td>$13,251,207</td>
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<tr>
<td>FY12</td>
<td>$11,105,683</td>
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<tr>
<td>FY13</td>
<td>$10,622,406</td>
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<tr>
<td>FY14</td>
<td>$10,136,286</td>
</tr>
<tr>
<td>FY15</td>
<td>$9,242,046</td>
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<tr>
<td>FY16</td>
<td>$8,849,461</td>
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<tr>
<td>FY17</td>
<td>$7,891,291</td>
</tr>
<tr>
<td>FY18</td>
<td>$9,660,605</td>
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CVM Submitted Proposals by rank (FY18)

![Bar chart showing submitted proposals by rank for FY17 and FY18. The chart displays data for Other, Assistant, Associate, Full, and Total ranks. The chart indicates a significant increase in submissions for the Total rank in FY18 compared to FY17.](#)
Growth in CVM Awards by rank (FY18)
Growth in CVM Awards (FY18): Federal
CVM Awards FY19: A Strong Start

Guaquan Zhang: NIH R01, $2,147,908
Craig Emter: DOD/CDMRP, $1,281,479
Joan Coates: NIH R21, $472,666
Rajiv Mohan: NIH R21, $426,250; NIH R21, $425,425
Frank Booth: NIH R21, $417,969
Elizabeth Bryda/Chris Lorson: NIH P40 Supplement, $375,412
Kun-Eek Kil: AHA, $200,000
Shuping Zhang: FDA, $119,350; USDA Lab Level-1: $328,000
Chris Lorson/Erkan Osman: DOD/CDMRP, $2,750,000 ($750,000 to MU)

Pending submissions increased including: NIH IRACDA Training Grant, $5,149,597
Academic Departments

• Biomedical Sciences
  • Chair: Doug Bowles, PhD

• Veterinary Medicine and Surgery
  • Chair: John R. Dodam, MS, PhD, DVM

• Veterinary Pathobiology
  • Chair: George Stewart, PhD
CVM Research Areas

- Cancer
- Cardiovascular
- Neuro-muscular
- Infectious Disease
- Genetics Genomics
- Agriculture
- Nutrition GI
- Eye
- Human-Animal Bond
- Behavior Aging

Collaboration
Training
Resources
CVM Research Areas

• **Food Animal/Agriculture/Wildlife**
  – Shuping Zhang, John Middleton, Pedro Melendez, Pamela Adkins, Tim Evans, Scott Poock, Veronique Bernier Gosselin, Dusty Nagy, Sarah Hooper, Stan Casteel Alex Bukoski

• **Research Training**
  – Craig Franklin, Elizabeth Bryda, Brian Flesner, Fred Mann

• **Genetics/Genomics/Microbiome**
  – Leslie Lyons, Dennis O’Brien, Gary Johnson, Yoshihiko Yu, Aaron Ericsson

• **Infectious Disease**
  – Alexander Franz, Guoquan Zhang, Solomon Odemuyiwa, Jerod Skyberg, Deborah Anderson, Charles Brown, Elizabeth Schaefer, Brenda Beerntsen, Paul Anderson, Leah Cohn, Mick Calcutt, Tamara Gull, Jeffrey, Rachel Olson, George Stewart
CVM Research Areas

- **Cardiovascular/Respiratory**
  - Nicole Nichols, Carol Reinero, Laurel Grisanti, Craig Emter, Harold Laughlin, Shawn Bender, Doug Bowles, Kevin Cummings, Chris Baines, Eileen Hasser, Cheryl Heesch, David Kline

- **Cancer/Radiopharmaceuticals**
  - Jimmy Lattimer, Sandra Bechtel, Jeff Bryan, Senthil Kumar, Charlie Maitz, James Amos-Landgraf, Stacey Leach, Brian Flesner, Kun-Eek Kil, Shirley Chu, Sessaly Reich, Melanie Moore, Carolyn Henry, Angela McCleary-Wheeler, Salman Hyder

- **Neurology/Muscle/Behavior/Aging**
  - Joan Coates, Cheryl Rosenfeld, Heide Schatten, Yuksel Agca, Frank Booth, Megan Haney, Chris Lorson, Monique Lorson, Monir Shababi, Erik Osman, Bryan Torres
CVM Research Areas

• **Nutrition/Gastroenterology**
  - Bob Backus, Owen Skinner, Megan Grobman, Tabitha Hookey, Lane Clarke

• **Human-Animal Interaction**
  - Rebecca Johnson, Gretchen Carlisle

• **Gene Modification – Animal Models**
  - Elizabeth Bryda, Craig Franklin, Daniel Davis, Chris Lorson, Hongsheng Men

• **Ophthalmology**
  - Rajiv Mohan, Shyam Chaurasia, Todd Marlo
Vet Med Rankings: NIH Funding

MU CVM Ranks 11th in the US
CVM Service Units

• Veterinary Health Center
  • Director: David A. Wilson, DVM, MS

• Veterinary Medical Diagnostic Laboratory
  • Director: Shuping Zhang, MS PhD, DAAVM

• Laboratory for Infectious Disease
  • Director: Jeffrey Adamovicz, PhD
CVM Service Units

- MU Mutant Mouse Resource Center
  - Director: Craig Franklin, DVM, PhD, DACLAM

- MU Rat Resource & Research Center
  - Director: Elizabeth Bryda, MS, PhD
• One of four nationally → $8,122,720

• Only national center → $8,053,234
College of Veterinary Medicine

Metagenomics Center
University of Missouri
Mizzou Advantage (est. 2014)

Animal Modeling Core
University of Missouri
Mission Enhancement (est. 2016)

MMRRC
Mutant Mouse Resource & Research Centers supported by NIH
U42 OD010918-19 (est. 2000)

RRRC
Rat Resource & Research Center
P40 OD011062-18 (est. 2001)

CMP
Comparative Medicine Program
University of Missouri
T32 OD011126-39 (est. 1978)

Veterinary Research Scholars Program
University of Missouri
Sponsored by Boehringer Ingelheim, IDEXX BioResearch, and MU College of Veterinary Medicine.

IDEXX BioResearch
Industry partners
Discovery Ridge Overview

- Grant Funding: > $3 million in NIH funding in FY18
- Program Income: > $500K annually
- Partnerships: IDEXX BioResearch; over 200 MU, national and international collaborators and users; includes academics, pharma, biotech, CROs
- CMP Trainees: > 100 trained; our graduates represent ~ 8% of board certified diplomates in Lab Animal Medicine; 50 mentors from all major life science units at MU participate
- VRSP: > 300 vet students have gained research experience
MU initiatives

- Translational Precision Medicine Complex
- Attract three to five externally funded national research centers in the next five years.

Next?

- Submitted RFA-RM-17-013 Compound Identification Development Cores (U2C)
- Submitted in response to RFA-RM-18-012: NIH Somatic Cell Genome Editing (SCGE) Program (U42)
What does “translational” mean to the CVM?
College of Veterinary Medicine

One Health: Human and Animal bench-to-bedside

Develop animal models, characterize models, basic research, test therapeutics and medical devices in animals, pre-clinical trials
CVM clinical trials: 31 active trials

<table>
<thead>
<tr>
<th>Title</th>
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<tbody>
<tr>
<td>Autologous Apocrine Gland Adenocarcinoma of the Anal Sac Vaccine Study</td>
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<tr>
<td>Use of CT/18F-FDG PET imaging in the prognosis and pathologic evaluation of soft tissue sarcomas</td>
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<tr>
<td>Canine Cachexia Study</td>
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<tr>
<td>Demethylating Agent Priming of Canine Lymphoma</td>
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<tr>
<td>Electromagnetic Hyperthermia-RT Study</td>
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<td>NCI-COTC026-OSA</td>
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<tr>
<td>Hiltonol®-Poly-ICLC</td>
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<tr>
<td>ISOPET™ ⁹⁰Yttrium STS Study</td>
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<tr>
<td>Additional Endeavors</td>
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CVM Translational Medicine: Degenerative myelopathy

- Dogs will be administered a drug that will repress the production of the mutated protein, superoxide dismutase 1 (SOD1)
- The drug will be injected into the spinal fluid that surrounds the spinal cord
- The studies will be randomized and double-blinded

Joan R. Coates, DVM, MS, DACVM-Neurology
CVM Translational Medicine: Canine B cell lymphoma

• Safety/Efficacy of agents that modify gene expression (6-thioguanine or azacitidine) when used prior to standard chemotherapy

Brian K. Flesner, DVM, MS, DACVIM-Oncology
CVM Imaging:

PET Imagining Center: Director: Dr. Jeffrey Bryan, DVM, MS, PhD, DACVIM (Oncology)

- Magnetic Resonance Imaging (MRI)
- Nuclear Medicine and Positron Emission Tomography (PET)
- Computed Tomography (CT)
- Fluoroscopy
MU initiatives

- Increase transdisciplinary initiatives

New training programs

Innovative teaching and residency training
Programs for science education

Marketing and market research

IP, MTAs, international law

Science writing, marketing

Industry partners
CVM Looking Forward

• Expanded clinical services (Wentzville and KC)
• New Microbiology Undergraduate degree (G Stewart)
• New Online Programs and Certificates
• Submitting for new Centers
• New joint faculty recruitment in influenza (Wan and Ma)
• Plans for a new VMDL and demolition of VetSci
• Develop collaborative projects that build upon unique MU strengths (MURR/LIDR)