University of Missouri Veterinary Medical Diagnostic Laboratory (VMDL) Annual Report – 2016

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Summary

The University of Missouri Veterinary Medical Diagnostic Laboratory (MU VMDL) is a full service veterinary diagnostic laboratory and it is Missouri’s only laboratory accredited by the American Association of Veterinary Laboratory Diagnosticians (AAVLD). The VMDL is also a Level II Lab of the National Animal Health Laboratory Network (NAHLN) and Tier I Lab of the FDA Veterinary Laboratory Response Network (FDA Vet-LRN). In 2016, the VMDL processed approximately 48,599 accessions (about 13% increase from 2015) and performed 111,506 tests. The VMDL diagnostic service was utilized by veterinarians and owners from 45 US states and 109 MO counties. In 2016, the VMDL faculty taught (or co-taught) 37 courses and 16 clinical/diagnostic rounds. The VMDL faculty participated in various national, state and university leadership activities. The faculty were funded by 10 extramural grants, published 41 peer-reviewed papers; presented 56 conference abstracts, posters, and presentations; and attended 15 international, national and state conferences and trainings.
Introduction

The MU VMDL is a full service veterinary diagnostic laboratory and it is Missouri’s only laboratory accredited by the American Association of Veterinary Laboratory Diagnosticians (AAVLD). The faculty and staff of VMDL are committed to excellence in diagnostic service, veterinary education, and research. The faculty and staff strive to provide relevant, timely, and cost-effective diagnostic services to our clients and create a positive learning environment for our students. In collaboration with the United States of America (USDA), Food and Drug Administration (FDA), Missouri Department of Agriculture (MDA) and Missouri Department of Health and Senior Services (MDHSS), the VMDL plays a vital role in safeguarding Missouri’s animal agriculture, animal health, and public health.

The Veterinary Medical Diagnostic Laboratory (VMDL) Annual Report – 2016 is a compilation of test data from Jan 1, 2016 to Dec 30, 2016. To monitor service productivity, testing data from 2012 to 2015 are also included in this report.

VMDL Mission Statement

To provide appropriate and timely diagnostic support to veterinary practitioners, livestock and poultry interests, companion animal interests, wildlife conservationists, and state-federal regulatory officials.

To monitor domestic animals, indigenous wildlife, and zoo animals for diseases that are a threat to livestock health and public health.

To support the teaching mission of the College of Veterinary Medicine.

To create new knowledge through fundamental and translational research.

VMDL Advisory Board

Mission Statement

To advise VMDL management on policies, long-term developmental strategies, and collaborations with relevant university, private, state, national and international organizations.

VMDL Advisory Board Membership

The Advisory Board consists of 12 members representing the State Veterinarian’s office, commodity groups, small animal practice, large animal practice, and the Veterinary Teaching Hospital.

VMDL Advisory Board Members

Linda Hickam, DVM, Missouri State Veterinarian

Tony Martin, DVM, Director of Animal Health Division, MFA, Inc.

Don Nikodim, Executive Vice President, Missouri Pork Association
Steve Patterson, DVM, Bethel, MO
Clark Fobian, DVM, Sedalia, MO, Immediate Past President AVMA
Steve Strubberg, DVM, Hermann, MO
Chuck Massengill, DVM, Missouri Cattlemen’s Association
Bruce Addison, President, Addison Biological Laboratory, Inc.
David Wilson, DVM, MS, ACVS, MU VHC Director
Phillip Johnson, BVSc, MS, MRCVS, ACVIM MU VHC Equine Service
John Middleton, DVM, PhD, ACVIM MU VHC Food Animal Service

**VMDL Organizational Structure**

**VMDL Section Heads/Leaders and Staff Supervisors**

Anatomical Pathology – Dr. Gayle Johnson
Avian Pathology – Dr. Dan Shaw
Bacteriology/Mycology – Dr. Bill Fales/Ms. Irene Ganjam
Business Office – Mr. Mike Wimmenauer
Clinical Pathology – Dr. Marlyn Whitney/Ms. Cheryl Rojas
Director’s Office – Ms. Geri Hegstad
Histology – Dr. Dae-Young Kim/Ms. Candace Kassel
Molecular Diagnostics – Dr. Jeff Mitchell/Dr. Odemuyiwa, Solomon (Wole)
Quality Assurance – Dr. Tom Reilly/Ms. Susan Martin
Sample Receiving – Ms. Geri Hegstad
Serology – Dr. Mike Zhang
Virology – Dr. Jeff Mitchell
Toxicology – Dr. Tim Evans/Dr. George Rottinghaus

**VMDL Diagnostic Program Coordinators**

Anatomical Pathology Residency Program – Dr. Kei Kuroki
Clinical Pathology Residency Program – Dr. Charles Wiedmeyer
Equine Diagnostic Investigations – Dr. Fred Williams III
Food Animal Diagnostic Investigations – Dr. Tim Evans
Neuropathology and Oncopathology – Dr. Gale Johnson
Small Animal Internal Medicine Pathology – Dr. Dae-Young Kim

**VMDL Service Activities**

### Table 1. Five Year VMDL (Main Lab and Clinical Pathology) Accessions*

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Accession</th>
<th>Main VMDL</th>
<th>Clinical Pathology</th>
<th>Missouri &amp; Other States</th>
<th>Teaching Hospital</th>
<th>MU Research</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>37,715</td>
<td>24,923</td>
<td>12,792</td>
<td>19,911 (53%)</td>
<td>16,118 (43%)</td>
<td>1,451 (3.8%)</td>
<td>235 (1%)</td>
</tr>
<tr>
<td>2013</td>
<td>38,499</td>
<td>25,165</td>
<td>13,334</td>
<td>20,081 (52%)</td>
<td>16,460 (43%)</td>
<td>1,867 (4.8%)</td>
<td>91 (&lt;1%)</td>
</tr>
<tr>
<td>2014</td>
<td>37,666</td>
<td>24,431</td>
<td>13,235</td>
<td>19,733 (52%)</td>
<td>16,476 (44%)</td>
<td>1,378 (3.6%)</td>
<td>79 (&lt;1%)</td>
</tr>
<tr>
<td>2015</td>
<td>42,929</td>
<td>26,276</td>
<td>16,653</td>
<td>20,966 (49%)</td>
<td>20,475 (48%)</td>
<td>1,390 (3.2%)</td>
<td>98 (&lt;1%)</td>
</tr>
<tr>
<td>2016</td>
<td>48,599</td>
<td>30,014</td>
<td>18,585</td>
<td>26,279 (54%)</td>
<td>22,320 (46%)</td>
<td>603 (1.2%)</td>
<td>338 (&lt;1%)</td>
</tr>
</tbody>
</table>

*A Main Lab accession may include multiple tests for multiple samples whereas each Clin Path accession represents one test performed on one sample. Caseload increased 13.2% from 2015 to 2016. Data do not include non-technical procedures.
Table 2. Five Year VMDL (Main Lab and Clin Path) Tests by Animal Species*

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Avian</th>
<th>Bovine</th>
<th>Canine</th>
<th>Caprine</th>
<th>Equine</th>
<th>Feline</th>
<th>MISC</th>
<th>Ovine</th>
<th>Porcine</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>86,693</td>
<td>6,688</td>
<td>16,225</td>
<td>34,472</td>
<td>2,495</td>
<td>12,175</td>
<td>6,043</td>
<td>4,203</td>
<td>645</td>
<td>3,747</td>
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<tr>
<td>2013</td>
<td>86,570</td>
<td>6,554</td>
<td>14,599</td>
<td>36,173</td>
<td>1,649</td>
<td>11,339</td>
<td>6,752</td>
<td>4,614</td>
<td>361</td>
<td>4,529</td>
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<tr>
<td>2014</td>
<td>83,869</td>
<td>5,784</td>
<td>15,806</td>
<td>35,421</td>
<td>1,280</td>
<td>10,038</td>
<td>5,908</td>
<td>4,964</td>
<td>462</td>
<td>4,206</td>
</tr>
<tr>
<td>2015</td>
<td>90,515</td>
<td>6,919</td>
<td>17,070</td>
<td>37,258</td>
<td>1,307</td>
<td>10,031</td>
<td>6,563</td>
<td>6,961</td>
<td>404</td>
<td>3,780</td>
</tr>
<tr>
<td>2016</td>
<td>111,506</td>
<td>8,977</td>
<td>19,971</td>
<td>45,036</td>
<td>1,682</td>
<td>9,726</td>
<td>7,159</td>
<td>12,269</td>
<td>671</td>
<td>6,015</td>
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</table>

Table 3. Five Year VMDL (Main Lab and Clin Path) Tests by Section

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Avian</th>
<th>Bacti</th>
<th>Clin Path</th>
<th>Path/Histo</th>
<th>Mol</th>
<th>Sero</th>
<th>Vir</th>
<th>Tox</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
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<td>86,693</td>
<td>2,490</td>
<td>15,552</td>
<td>18,050</td>
<td>22,062</td>
<td>9,498</td>
<td>13,723</td>
<td>491</td>
<td>1,277</td>
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<tr>
<td>2013</td>
<td>86,570</td>
<td>2,535</td>
<td>14,849</td>
<td>20,123</td>
<td>23,696</td>
<td>7,105</td>
<td>12,464</td>
<td>515</td>
<td>1,179</td>
<td>4,104</td>
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<tr>
<td>2014</td>
<td>83,869</td>
<td>2,145</td>
<td>14,094</td>
<td>18,632</td>
<td>22,306</td>
<td>7,521</td>
<td>12,994</td>
<td>588</td>
<td>1,558</td>
<td>4,031</td>
</tr>
<tr>
<td>2015</td>
<td>90,515</td>
<td>3,450</td>
<td>15,371</td>
<td>22,958</td>
<td>22,601</td>
<td>7,816</td>
<td>13,548</td>
<td>584</td>
<td>1,456</td>
<td>2,731</td>
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<tr>
<td>2016</td>
<td>111,506</td>
<td>5,374</td>
<td>18,896</td>
<td>26,516</td>
<td>32,282</td>
<td>9,094</td>
<td>14,039</td>
<td>949</td>
<td>4,355</td>
<td>N/A</td>
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</tbody>
</table>

Figure 1. Distribution of Diagnostic Tests by Animal Species
Table 4. Distribution of VMDL Accessions in 109 MO Counties/Independent City

<table>
<thead>
<tr>
<th>County</th>
<th>Accessions</th>
<th>County</th>
<th>Accessions</th>
<th>County</th>
<th>Accessions</th>
<th>County</th>
<th>Accessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boone</td>
<td>28134</td>
<td>St. Francois</td>
<td>186</td>
<td>Macon</td>
<td>74</td>
<td>Henry</td>
<td>27</td>
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<tr>
<td>Saint Louis</td>
<td>1628</td>
<td>Newton</td>
<td>180</td>
<td>Madison</td>
<td>74</td>
<td>Harrison</td>
<td>21</td>
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<tr>
<td>Greene</td>
<td>1036</td>
<td>Pettis</td>
<td>172</td>
<td>Saint Louis City</td>
<td>72</td>
<td>Mississippi</td>
<td>21</td>
</tr>
<tr>
<td>Not Specified</td>
<td>1028</td>
<td>Saline</td>
<td>172</td>
<td>Warren</td>
<td>72</td>
<td>Barton</td>
<td>20</td>
</tr>
<tr>
<td>Saint Charles</td>
<td>811</td>
<td>Clay</td>
<td>159</td>
<td>Oregon</td>
<td>66</td>
<td>Lewis</td>
<td>19</td>
</tr>
<tr>
<td>Jackson</td>
<td>566</td>
<td>Ray</td>
<td>149</td>
<td>Taney</td>
<td>66</td>
<td>Bollinger</td>
<td>18</td>
</tr>
<tr>
<td>Johnson</td>
<td>525</td>
<td>Texas</td>
<td>146</td>
<td>Benton</td>
<td>62</td>
<td>Pulaski</td>
<td>15</td>
</tr>
<tr>
<td>Franklin</td>
<td>522</td>
<td>Webster</td>
<td>146</td>
<td>Cedar</td>
<td>62</td>
<td>Maries</td>
<td>14</td>
</tr>
<tr>
<td>Callaway</td>
<td>495</td>
<td>Lawrence</td>
<td>145</td>
<td>Carroll</td>
<td>61</td>
<td>Shannon</td>
<td>13</td>
</tr>
<tr>
<td>Cole</td>
<td>483</td>
<td>Miller</td>
<td>143</td>
<td>Audrain</td>
<td>60</td>
<td>Atchison</td>
<td>12</td>
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<tr>
<td>Cape Girardeau</td>
<td>352</td>
<td>Andrew</td>
<td>135</td>
<td>Adair</td>
<td>57</td>
<td>Chariton</td>
<td>11</td>
</tr>
<tr>
<td>Jefferson</td>
<td>318</td>
<td>Osage</td>
<td>122</td>
<td>Sainte Genevieve</td>
<td>56</td>
<td>Ozark</td>
<td>11</td>
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<tr>
<td>Christian</td>
<td>304</td>
<td>Wright</td>
<td>122</td>
<td>Platte</td>
<td>55</td>
<td>Ripley</td>
<td>10</td>
</tr>
<tr>
<td>Howell</td>
<td>286</td>
<td>Cooper</td>
<td>119</td>
<td>Dent</td>
<td>49</td>
<td>DeKalb</td>
<td>9</td>
</tr>
<tr>
<td>Phelps</td>
<td>274</td>
<td>Scott</td>
<td>118</td>
<td>Morgan</td>
<td>49</td>
<td>McDonald</td>
<td>9</td>
</tr>
<tr>
<td>Jasper</td>
<td>272</td>
<td>Moniteau</td>
<td>116</td>
<td>Montgomery</td>
<td>47</td>
<td>Perry</td>
<td>7</td>
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<tr>
<td>Gasconade</td>
<td>263</td>
<td>Saint Clair</td>
<td>111</td>
<td>Knox</td>
<td>45</td>
<td>Sullivan</td>
<td>5</td>
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<tr>
<td>Camden</td>
<td>262</td>
<td>Howard</td>
<td>107</td>
<td>Laclede</td>
<td>45</td>
<td>Gentry</td>
<td>4</td>
</tr>
<tr>
<td>Lafayette</td>
<td>261</td>
<td>Bates</td>
<td>98</td>
<td>Shelby</td>
<td>39</td>
<td>Putnam</td>
<td>4</td>
</tr>
<tr>
<td>Lincoln</td>
<td>252</td>
<td>Livingston</td>
<td>98</td>
<td>Scotland</td>
<td>38</td>
<td>Clinton</td>
<td>3</td>
</tr>
<tr>
<td>Cass</td>
<td>236</td>
<td>Stone</td>
<td>98</td>
<td>Stoddard</td>
<td>38</td>
<td>Holt</td>
<td>3</td>
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<tr>
<td>Grundy</td>
<td>226</td>
<td>Marion</td>
<td>97</td>
<td>Vernon</td>
<td>37</td>
<td>Schuyler</td>
<td>3</td>
</tr>
<tr>
<td>Barry</td>
<td>213</td>
<td>Nodaway</td>
<td>92</td>
<td>Clark</td>
<td>36</td>
<td>Dade</td>
<td>2</td>
</tr>
<tr>
<td>Buchanan</td>
<td>204</td>
<td>Pike</td>
<td>81</td>
<td>Crawford</td>
<td>32</td>
<td>Alameda</td>
<td>1</td>
</tr>
<tr>
<td>Butler</td>
<td>203</td>
<td>Randolph</td>
<td>81</td>
<td>Washington</td>
<td>31</td>
<td>Daviess</td>
<td>1</td>
</tr>
<tr>
<td>Polk</td>
<td>198</td>
<td>Dunklin</td>
<td>80</td>
<td>Dallas</td>
<td>29</td>
<td>Douglas</td>
<td>1</td>
</tr>
<tr>
<td>Monroe</td>
<td>195</td>
<td>Linn</td>
<td>78</td>
<td>Caldwell</td>
<td>27</td>
<td>Hickory</td>
<td>1</td>
</tr>
</tbody>
</table>

Marion 1
Figure 2. Distribution of VMDL Accessions in 45 Non-MO States*


**VMDL Client Outreach Programs**

The VMDL offers an online portal for its clients to check their results in real-time as we work on their samples.

VMDL continues to offer the FedEx Express Prepaid Stamps to all its clients, which enables inexpensive overnight delivery from clients’ office to the VMDL for laboratory testing. In 2016, the program was utilized 5,089 times by VMDL’s clients from 78 MO counties and 25 other states in the US.

**VMDL Participation in National Diagnostic and Surveillance Network**
Figure 3. Level II Lab of the National Animal Health Laboratory Network (NAHLN)

Figure 4. Tier I Member of the FDA Veterinary Laboratory Response Network (Vet-LRN)
## VMDL Faculty Teaching Activities

### Didactic and Labortary Courses (N = 37; Bold: Coordinated by VMDL Faculty )

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 140/2140</td>
<td>Companion Animals</td>
</tr>
<tr>
<td>AS 325/4977</td>
<td>Horse Production</td>
</tr>
<tr>
<td><strong>BioMed 3200</strong></td>
<td>Comparative Hematology</td>
</tr>
<tr>
<td>BioMED 3310</td>
<td>Biomedical Pathophysiology Online</td>
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<tr>
<td><strong>BioMed 4100</strong></td>
<td>Veterinary Clinical Chemistry, On-line</td>
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<tr>
<td>BioMed 4110/V_PBIO 7110</td>
<td>Veterinary Cytology</td>
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<tr>
<td>BioMED 4120</td>
<td>Principles of Toxicology On-line</td>
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<tr>
<td>LAB_AN 9437</td>
<td>Lab Animal Pathology</td>
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<tr>
<td>MMI 8050</td>
<td>Mechanisms of Microbial Pathogenesis</td>
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<tr>
<td>MICROB 9001</td>
<td>Topics in Microbiology</td>
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<tr>
<td>P Health 8001</td>
<td>Human Health and the Environment</td>
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<tr>
<td><strong>V_BSCI 5506</strong></td>
<td>Veterinary Cellular Biology</td>
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<tr>
<td><strong>V_BSCI 5507</strong></td>
<td>Veterinary Pharmacology</td>
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<td><strong>V_BSCI 5508</strong></td>
<td>Veterinary Pharmacology</td>
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<td><strong>V_BSCI 5509</strong></td>
<td>Veterinary Toxicology</td>
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<tr>
<td><strong>V_M_S 6400</strong></td>
<td>Food Animal Medicine &amp; Surgery I</td>
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<td><strong>V_M_S 6420</strong></td>
<td>Equine Medicine and Surgery I</td>
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<tr>
<td><strong>V_M_S 6987</strong></td>
<td>Problem-Based Learning Clinic Preparation</td>
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<td><strong>V_M_S 6996</strong></td>
<td>Advanced Dermatology</td>
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<td><strong>V_M_S 8036</strong></td>
<td>Advanced Physiology of Dog and Cat</td>
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<tr>
<td><strong>V_M_S 8402</strong></td>
<td>Seminar in Veterinary Clinical Sciences</td>
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<tr>
<td><strong>V_M_S 8402 B</strong></td>
<td>Seminar in Veterinary Clinical Sciences</td>
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<tr>
<td><strong>V_M_S 8402 D</strong></td>
<td>Clinicopathologic Case Conference (CPC)</td>
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<tr>
<td><strong>V_M_S 8415</strong></td>
<td>Advanced Veterinary Neurology</td>
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<tr>
<td><strong>V_M_S 8485</strong></td>
<td>Problems in Veterinary Clinical Science</td>
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<td><strong>V_PBIO 5552</strong></td>
<td>Veterinary Bacteriology 1</td>
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<td><strong>V_PBIO 5554</strong></td>
<td>Veterinary Virology</td>
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<td><strong>V_PBIO 6647</strong></td>
<td>Diagnostic Pathology and Special Species Medicine I</td>
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</table>
V_PBIO 6679  Diagnostic Pathology and Special Species Medicine II
V_PBIO 8434  Advanced Clinical Pathology
V_PBIO 8435  Advanced Microscopy in Veterinary Clinical Pathology
V_PBIO 9090  Area Veterinary Pathobiology Dissertation Research

Clinical and Diagnostic Rounds and Seminars (n=16)

Chemistry Rounds
Comparative Orthopaedic Laboratory (COL) journal club
Cytology Rounds
Dermatology Rounds
Food for Thought Rounds
Gross Pathology Rounds
Hematology Rounds
Human Health and the Environment - Image Review
Joint Pathology Center Wednesday Slide Conference
Mentoring International Students
Mentoring Pre-Vet Students
Neurology Rounds
Ophthalmic Pathology Rounds
Slide treats
VMDL-Food Animal Monthly Rounds

Residency Training Programs

Anatomical Pathology Resident Training
Clinical Pathology Resident Training
VMDL Faculty/Staff Academic Service & Leadership Activities

National

1. American Association of Veterinary Laboratory Diagnosticians (AAVLD) Quality Assurance Committee, Ms. Susan Martin, Dr. Tom Reilly, Dr. Shuping Zhang
2. American Association of Veterinary Laboratory Diagnosticians (AAVLD) Directors Committee, Government Relations Committee, Bacteriology and Mycology Subcommittee, Antimicrobial Subcommittee, Publication Committee, Dr. Shuping Zhang – Member
3. American Association of Veterinary Laboratory Diagnosticians (AAVLD) Virology Committee, Dr. Mike Zhang – Member
4. American Association of Veterinary Laboratory Diagnosticians/NAHLN Antimicrobial Surveillance Working Group, Dr. Shuping Zhang – Member
5. American Board of Veterinary Toxicologists, Dr. Evans – President-elect, 2014 to 2016
6. American Board of Veterinary Toxicologists, Dr. Evans – President, 2016 to 2018
7. American College of Veterinary Microbiologists (ACVM) Budget Committee, Dr. Shuping Zhang – Member
8. JVDI Editorial Board, Dr. Shuping Zhang – Member
9. Phi Zeta Veterinary Honor Society, Dr. Chuck Wiedmeyer – Secretary/Treasurer/Director, 2007 to present
10. USAHA-AAVLD Joint Committee on the Environment and Toxicology, Dr. Evans – Co-Chair, 2013 – present

University

1. Mizzou United Way Dr. Evans – Tri-Chair, 2015-2016
2. MU Campus Conflict of Interest Committee, Dr. Chuck Wiedmeyer – Vice Chair, 2011 to present
3. MU Chancellor’s Committee on Student Conduct, Dr. Chuck Wiedmeyer – Chair, 2009 to 2013, 2015 to present
4. MU Chancellor’s Standing Committee on Safety, Dr. Evans – Chair, 2014-2016
5. MU Chancellor’s Standing Committee on Safety, Dr. Evans, Member, 2016
6. MU College of Veterinary Medicine AES Research Committee, Dr. Evans – Member, 2013 – present
7. MU College of Veterinary Medicine Curriculum Committee, Dr. Evans – Member, 2014 – present
8. MU Council of International Initiative (CII), Dr. Shuping Zhang – Member
9. MU Faculty Equity Panel, Dr. Shuping Zhang – Panalist
10. MU Masters in Public Health Program, Dr. Evans - Core Faculty Member, 2016 - present
11. MU Pathobiology Area Executive Committee, Dr. Evans – Member, 2012-Present
12. MU VHC Advisory Board, Dr. Shuping Zhang – Member

College

1. CVM Academic Research Advisory Board, Dr. Shuping Zhang – Member
2. CVM Administrator Evaluation Committee, Dr. Kei Koroki – Member
3. CVM Admissions and Scholarships Committee, Dr. Dae-Young Kim & Dr. Mike Zhang – Members
4. CVM Animal Resources Committee, Dr. Jeff Mitchell – Member, 2006 to present
5. CVM Computer Committee, Dr. Kei Kuroki – Member
6. CVM COR Grant Review Committee, Dr. Gayle Johnson – Member
7. CVM Faculty Responsibility Committee, Dr. Angela Royal – Member
8. CVM Safety Committee, Dr. Shuping Zhang – Member

Departmental

1. Pathobiology Non-Tenure Track Promotion Committee, Dr. Dae-Young Kim & Dr. Shuping Zhang
2. Vet Pathobiology Promotion and Tenure Committee, Dr. Gayle Johnson – Member, 2016
3. VMDL Faculty Search Committee – Molecular Diagnostician. Dr. Chuck Wiedmeyer – Chair.
4. VMDL Faculty Search Committee – Bacteriologist. Dr. Kei Kuroki – Chair
5. VMDL Marketing Committee, Dr. Tim Evans, Dr. Kei Koruki, Dr. Fred Williams, Dr. Shuping Zhang
6. VMDL Quality Committee, Dr. Tom Rielly, Dr. Angela Royal, Mr. Jesse Bowman, Ms. Raina Cornell, Ms. Candace Kassel, Mr. Ben Landers, Ms. Amber Mann, Ms. Susan Martin, Ms. Rachel Newton, Ms. Cheryl Rojas, Ms. Latoyia Sly.

VMDL Faculty Scholarly Activities

Extramural Funding in 2016

1. **Kuroki, K.** Co-Investigator. Hung C (PI) (Cook JL Consortium PI). Columbia University/Prime sponsor: Musculoskeletal Transplant Foundation. Local Dexamethasone Delivery for Osteochondral Grafting. Direct: $85,307; Indirect: $17,061; Total: $102,368. 20% shared credit. 02/01/16 – 01/31/18


5. **Rottinghaus, G.** Co-PI. Analytical Core Research Sample Testing, 2016. ($160,000) 100% to VMDL.


9. **Zhang, S.** Validation of Campylobacter culture and PCR method for veterinary specimens. FDA/TAMU/ $6,000.


**Publications (N = 41)**


37. Yan, L., Pace, L. W., Baughman, B., Wilson, F. D., Zhang, S., Zhang, M. Z. Failed detection of bovine viral diarrhea virus 2a by direct fluorescent antibody test on tissue samples due to reduced reactivity of field isolates to raw anti-BVDV antibody. JVDI 28:150-157, 2016.


41. Zhang, M., Yang, M., Su, H., Rollins, D., Zhang, S. Description of Lactobacillus colinum sp. nov., isolated from Northern Bobwhite (Colinus virginianus). IJSEM 2016. 10.1099/ijsem.0.001624

Abstracts, Posters, and Presentations (N = 56)


10. Evans, T. J. Is it toxic?/how toxic is it? Electronic toxicology resources available to small animal practitioners. CVC Virginia Beach 2016, Virginia Beach, VA, May 15, 2016.

11. Evans, T. J. What you thought you would never need to know about plant toxins. CVC Virginia Beach 2016, Virginia Beach, VA, May 15, 2016.

12. Evans, T. J. What you thought you would never need to know about mycotoxins. CVC Virginia Beach 2016, Virginia Beach, VA, May 15, 2016.


25. Evans, T. J. Is it toxic?/how toxic is it? Electronic toxicology resources available to small animal practitioners. CVC Kansas City 2016, Kansas City, MO, August 26, 2016.

26. Evans, T. J. What you thought you would never need to know about plant toxins. CVC Kansas City 2016, Kansas City, MO, August 26, 2016.

27. Evans, T. J. So many pet food recalls….Is manufactured pet food actually safe??? CVC Kansas City 2016, Kansas City, MO, August 26, 2016.


29. Evans, T. J. How to identify cause of death when it’s NOT the vaccine or the feed. CVC Kansas City 2016, Kansas City, MO, August 27, 2016.


46. **Moser, C. J. Royal.** A. Chemistry Case Presentation – Not your typical diabetic dog. ACVP/ASVCP meeting in New Orleans LA. Dec 3-7 2016


2016 Major Annual Professional Meetings and Trainings Attended by VMDL Faculty and Staff (N = 15)

- AAVLD/NAHLN Auditors Training, February 2016
- AAVLD/NAHLN Quality Assurance Training, July 2016
- American Association of Veterinary Clinical Pathologists
- AAVLD/USAHA Annual Meeting, Greensboro, NC, October 14-16, 2016
- American College of Veterinary Pathologists meeting, New Orleans, LA, Dec 3-7, 2016
- AVMA Annual Convention, San Antonio, TX, August 6-8, 2016.
- CVC Kansas City 2016, Kansas City, MO, August 26 & 27
- Layer Health Management School, Madison, WI, 25-26 May 2016
- Midwest Association of Veterinary Pathologists Annual Meeting, August 11-12, 2016, Fall Creek Falls State Park, Pikeville, Tennessee.
- Missouri Veterinary Medical Association
- Missouri Department of Agriculture State and Federal Conference
- Missouri Dept. of Agriculture VFD Mtg., Columbia, MO, 30 October 2016
- Missouri Veterinary Medical Association West Central Monthly meetings