

## *Educator's Curriculum Vitae*

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### **EDUCATION**

2000, BS (Biotechnology), Worcester Polytechnic Institute, Worcester, MA, USA  
2004, DVM, Cummings School of Veterinary Medicine at Tufts University, North Grafton, MA, USA  
2007, MS (Clinical Sciences), Colorado State University, Fort Collins, CO, USA  
2007, Diplomate, American College of Theriogenologists  
2010, PhD, Physiology, Colorado State University, Fort Collins, CO, USA

### **ACADEMIC POSITIONS**

2012-present *Assistant Professor, NonTenureTrack (2012-17) and TenureTrack (2018-present) appointments.*  
Department of Biomedical Sciences, Colorado State University, Fort Collins, CO. Current % Effort: 65% Teaching, 20% Research/Creative Activity, 15% Service/Outreach, 0% Admin.

### **DOMAIN 1: TEACHING**

#### **D.1a. TEACHING ACTIVITIES:**

**Course Director:** *I am responsible for all programmatic and curricular development, content, delivery, and assessment. I also provide a great deal of mentoring, advising, and individualized support to my students.*

*CRN64749 VM618 Professional Veterinary Medicine – Histology and Physiology, 7 cr, Avg. 138 students.* This core DVM class is taught in the Fall. Since becoming director in 2016, I have continually worked to align the physiology content with histology and gross anatomy. Alignment with the CSU-University of Alaska Fairbanks course must also be maintained. In addition to the leadership necessary for execution of the course throughout the semester, my lectures have included Endocrinology, Cell Biology, Neural Signaling (11 hrs, 2016-19), Pulmonary Physiology (11hr, 2017-18). I work with the DVM Curriculum Committee and the Capstone Exam I coordinator to ensure that VM618 learning objectives are aligned with the Core Competencies for our DVM students and the Capstone Examination questions. DVM students must pass Capstone I exam to matriculate to Year 2. Major efforts in 2019 were alignment of Capstone I learning objectives with VM618 course objectives, Course Review by DVM Steering Committee, introduction of Team Based Learning for topics in Acid-Base Physiology. Major ongoing efforts in 2020 are course renovation for 100% online instruction Fall 2020.

*CRN26792 VM795-004 Large Animal Anatomy Independent Study, 1 cr, Spring 2016-18 (12-25 students).* Recognizing the need for additional opportunities for DVM students to engage in large animal anatomy, as well as review the anatomy they may not have fully grasped during the Fall core DVM anatomy course (VM616), the curriculum of this independent study is ever-evolving due to the variable learning needs of each student. We focus on dissection of fresh and embalmed equine, bovine, ovine, caprine, and porcine specimens as well as canine and feline specimens for comparative anatomy. The experience is enriched with other learning opportunities including advanced clinical applications such as nerve blocks, nasogastric tube placement, and surgical approaches. DVM students are required to spend 3 hrs/week in the lab for 1 credit. I spend on average 4 hrs/week with these students. New in 2020, unrelated to the COVID-19 online transition, was the addition of an applied study of food animal anatomy from a list of pre-selected anatomically based food/fiber animal diseases (ex. left displaced abomasum). The primary objective of this exercise was for students to develop communication skills for discussing the underlying anatomical or pathophysiological basis for disease with a producer or lay person. The reports were intended to opportunities for outreach presentations on these topics, but were cancelled due to COVID-19 closures.

*CRN11434(18480) BMS305-001(201) Domestic Animal Gross Anatomy(Honors), 4 cr, Spring 2012-18, Avg. 120 students.* This course is a survey of domestic animal anatomy (dog, cat, horse, cow, goat, pig) with a focus on first order integration of anatomical concepts and identification of anatomical structures using prosected specimens that are dissected in another course (BMS531). I provide 25 (of 42) hrs lecture/semester, oversee two regular laboratory sections of 2 hours each/week, and organize 12 additional "open lab" hours each week for students in our laboratory facility that are facilitated by our GTAs (BMS684) and TAs (BMS384). This course relies heavily on the Virtual Animal Anatomy programs and has become the research laboratory in which I can test hypotheses related to teaching, including 1) inherent spatial skills can predict student success in the anatomy laboratory; 2) spatial skills can be developed in a gross anatomy course; 3) Virtual Canine Anatomy can improve teaching efficacy in a canine dissection anatomy laboratory; 4) Intervention strategies based on low-stakes assessments and student utilization of a virtual reality anatomy program can improve student success. I gave fewer hours of lecture SP19, but provided regular input and lecture attendance for the new instructor (Andrew Garrett). In addition to the 7 laboratory quizzes that were introduced in 2016, in 2019 I introduced

high frequency, low stakes weekly Canvas quizzes to improve feedback and guide student self-assessment prior to the laboratory quizzes. Utilization of these evidence-based strategies as resulted in reduced DFW rates, improved student satisfaction and confidence with their ability to succeed in BMS305 as evaluated through TILT Learning Ecologies and ACSU student surveys, and success if/when they enroll in a DVM program. Additionally, use of the VAA-LTI through Canvas is allowing for identification of students who are not engaging early in the VAA to facilitate course success (presented at RTA Summer 2019). Spring 2020 brought many changes, including additional course elements of guided quizzes and virtual open labs.

*CRN11447 BMS 531-L01 Domestic Animal Dissection, 3 cr, Spring 2012-18, Avg. 30 students.* This dissection course provides the specimens used in the BMS305 class and uses the didactic content taught in BMS305 to ask for higher order integration of anatomical concepts, including weekly Canvas quizzes to ensure adequate laboratory preparation and "Table checks" for oral evaluation of specimen preparation and student knowledge. I currently spend 6 of 9 hrs of scheduled laboratory time each week for this course to guide dissections and challenge their knowledge. Virtual table checks using MSTeams and the Virtual Animal Anatomy program, as well as VoiceThread projects, were used to keep students engaged in this laboratory dissection course following the online transition Spring 2020.

*CRN18390 BMS 633-001 Domestic Animal Anatomy – Case Discussions, 2 cr, Spring 2012-18, Avg. 16 students.* This is an advanced, case-based study of anatomy for development of critical thinking and problem-solving skills. The class is typically composed of the MS students in the animal anatomy concentration and some truly spectacular undergraduates who have completed BMS305/531. Group case presentations are used to develop communication and teamwork skills, with individual unit assessments. The course directly prepares graduate students for the Comprehensive Examination in Animal Anatomy. I attend DVM Continuing Education (CE) events each year and review current literature so that I may continue to develop new anatomy-related clinical case studies for this course, and provide an up to date clinical perspective.

*CRN26011 BMS496D-235 Honors Breakout Session BMS305, 1 cr, Spring 2013-18, Avg. 10 students.* This is a case-based study of anatomy for the University Undergraduate Honors students enrolled in BMS305 that integrates physiology and developmental anatomy with the basics of clinical reasoning. I developed the curriculum for this course in 2014 and love teaching it. The students assemble a canine skull, thoracic and pelvic limbs (canid, equid, bovid) that they are able to keep, and give final course reflective presentations. Many of my Undergraduate Honors thesis students come from this and the regular BMS305 course.

*CRN11443 BMS 384-001 Supervised College Teaching, 1-3 cr, Spring 2012-18, Avg. 25 students.* Teaching assistants (TAs) have completed BMS305 with a B or higher and are typically co-enrolled in BMS531. TAs improve the student: support ratio in BMS305 and staff BMS305 open labs (12 hrs/week). In 2014, I initiated a weekly (1 hr) TA meeting to provide them with mentorship, review teaching strategies, and prepare the team for upcoming laboratory sessions. TAs assist with set up and proctoring of laboratory assessments. Following CSU closure Spring 2020, we created 40+ hrs/week of TA Zoom-facilitated open lab to support BMS305.

*CRN11443 BMS 684-001 Supervised College Teaching, 1-3 cr, Spring 2012-18, Avg. 5 students.* Teaching assistants (TAs) have completed BMS531 with a B or higher and improve student: support ratio in BMS531. Participation in BMS384 TA meetings for mentorship is required, and these students are typically co-enrolled in BMS495. BMS684 enrollment also includes 2 Graduate Teaching Assistants who are mentored and trained annually to provide support for the animal anatomy BMS305/531 courses. The GTAs assist with developing each examination and are tasked with writing examination questions related to learning objectives for each lecture. We review these together to develop their assessment skills and add finalized questions to the question databanks for the BMS305 and 531 courses. Post-examination statistics are reviewed to assess question quality. Each year there are 2 GTAs who assist with grading the BMS305 and BMS531 examinations, give a single lecture in BMS305, and receive mentored teaching training in anatomy during the semester.

*CRN50293(Su)/61772(Fa)/11445(Sp) BMS495-001 Independent Study, 1-2 cr, 2012-18, Avg. 12 students/yr.* These undergraduate students complete a variety of highly personalized projects including, but not limited to, clinical experience in conjunction with a skeletal assembly and a reflective, anatomy-based, clinical case report. If they have completed BMS305/531, then they may also participate in VM795 dissection.

*BMS3XX Applied Food and Fiber Animal Anatomy Course – 3 cr, Launching Fall 2021.* In the design phase now, a review of the literature and survey of large/food animal faculty has revealed major anatomy related diseases for curricular development. The objectives for this course will not overlap with BMS305 Domestic Animal Anatomy and students will be able to obtain credit for both courses, including our MS-B animal anatomy students. Major areas of focus will include ruminant claw/hoof, GI, and mammary/reproductive applied anatomy to give non-veterinary professionals the anatomical and directional terminology tools to understand common anatomy-based diseased and communicate with veterinarians for animal care. The course will go through BMS and UCC approval as an experimental course Fall 2021. This course will be

a case-based survey of those anatomically related diseases in chickens, camelids, sheep, goats, cattle, and pigs. Each until will have 4 major “problems” from each of these major production species that the students will use Team Based Learning strategies to solve.

**Course Support:** I provide guest lectures, support to laboratory teaching, and assist with exam question development or grading when related to my area of support. Learning objectives are developed in conjunction with the course director to ensure continuity in curriculum.

CRN64744VM 616 Professional Veterinary Medicine – Functional Anatomy, 9 cr, Avg. 138 students, 12 hours/week  
 Fall 2018-2019, floor anatomist and course support as needed, case study/recitation (1 hr)  
 Fall 2016-2017, floor anatomist (32 hrs of equine clinical and reproductive anatomy) case study/recitation (1 hr)  
 Fall 2013-2015, floor anatomist (64 hrs for Head and Thorax, Abdomen, Pelvis Units)  
 Fall 2012, floor anatomist (32 hrs for Thorax, Abdomen, Pelvis Unit)

CRN64749 VM618 Professional Veterinary Medicine – Histology and Physiology, 7 cr, Avg. 138 students  
 Fall 2015, Cardiovascular Physiology (11 hrs), Endocrinology, Nerve and Muscle Cell Biology (11 hrs)  
 Fall 2014, Endocrinology, Nerve and Muscle Cell Biology (11 hrs)

CRN64760 VM722-001 Professional Veterinary Medicine – Pharmacology, 4 cr, Avg. 138 students  
 Fall 2015-19, Capstone Lecture “Inflammatory Airway Disease” (1 hr)

CRN15460 BMS260-R01, BMS 260 Introduction to Biomedical Sciences, 72 students  
 Spring 2018 Faculty Guest Lecturer “From research to teaching: how are things at your end?” (1 hour)

**Quantitative Course Survey Data**

**Table 1. Anatomy Teaching ACSU Student Survey Results**

Course-Year Question (1-5 scale, 5 highly rated)	305-12	305-17	496-17	496-18	384-17	384-18	684-17	531-17	531-18	633-12	633-18	MEAN ±SEM
How well were the course objectives communicated to students?	4.57	4.78	5.00	5.00	4.86	4.63	5.00	4.26	4.62	4.35	4.60	4.67±0.1
How well did class sessions increase your understanding of the subject?	4.58	4.74	5.00	5.00	4.92	4.57	5.00	4.35	4.69	4.35	5.00	4.74±0.1
How effectively did the instructor facilitate student learning?	4.77	4.84	5.00	5.00	4.93	4.75	5.00	4.58	4.69	4.06	5.00	4.75±0.1
How well did the instructor create an atmosphere that was respectful of student opinions, ideas, and differences?	4.67	4.75	4.89	5.00	4.93	4.75	5.00	4.39	4.92	5.53	5.00	4.94±0.1
How do you rate this instructor?	4.65	4.82	5.00	5.00	5.00	5.00	5.00	4.45	4.92	4.24	5.00	4.83±0.1
Number of respondents/total class:	74/ 135	87/9 6	4/ 6	6/ 9	14/1 8	8/33	2/ 5	15/2 6	13/4 2	9/ 18	4/ 16	

**Table 2. 2020 Anatomy Learning Ecology COVID-19 Transition Survey**

Survey modeled after the 2014/5 TILT Learning Ecologies BMS305 Surveys

Course-Year Question (2020 & 2015 1-7 scale, 7 strongly agree; 2014 1-5 scale, 5 strongly agree)	531-20	305-20	305-15	305-14
I enjoy this subject.	6.88	6.65	6.68	4.56
This class has increased my interest in this subject	6.88	6.59	6.47	4.43
I would like to learn more about this subject.	6.88	6.60	6.53	4.61
I want to take other classes in this subject.	6.72	6.44	6.40	4.44
This course followed the syllabus.	6.36	6.69	6.73	4.51
I can explain course concepts to others who do not know anything about this course.	6.56	6.66	6.34	4.29
I can apply what I learn in this class to other classes.	6.68	6.52	6.40	4.35
Success in this course means getting an A	4.60	4.28		4.49
Success in this course means developing a deeper understanding of the subject.	6.92	6.70		4.78
Success in this course means being able to apply the knowledge gained in this course beyond this semester.	6.92	6.74		
I am confident I can get a passing grade in this course			6.34	
I consider my personal outcome in this course this semester to be a success.	6.48	5.91		
The quizzes in this course guide my study and self-assessment.	5.44	6.12		

The exams in this course accurately assess what I know about the subject.	6.12	5.92		
The exams in this course required me to think about anatomical relationships	6.44	6.44		
The Virtual Animal Anatomy (VAA) program helps me learn anatomy.	6.36	6.33		
The COVID-19 transition in this course was a success.	5.76	5.51		
The average time per week required by this course BEFORE Spring Break was appropriate.	5.40	5.84		
The average time per week required by this course AFTER Spring Break was appropriate.	5.44	5.41		
I believed in my ability to get a passing grade for this class BEFORE	6.40	6.20		
I believed in my ability to get a passing grade for this class AFTER Spring Break.	6.60	5.73		
The resources or activities made available to me BEFORE Spring Break facilitated my learning in this course.	6.68	6.61		
The resources or activities made available to me AFTER Spring Break facilitated my learning in this course.	5.64	5.31		
Performing cadaveric dissection is necessary for obtaining a deeper understanding of anatomical relationships.	6.76			
The Table Checks in this course guided my study and self-assessment.	6.60			
Survey response rate/course enrollment	28/ 31	120/ 131	85/ 106	70/ 93

**Table 3. DVM Student Survey - Rating and Response Rate -**

The instructor taught in a way that helped you learn the most important information - Mean Rating 1.8±0.08

Course -Year (1-5 scale, 1 strongly agree)	2014	2015	2016	2017	2018	2019
VM 722 Rating	1.52	1.74	2.26	2.00	1.55	2.00
VM 616 Rating	~	~	1.25	1.71	1.50	1.60
VM 618 Rating	~	1.72	1.67	2.28	2.21	1.71
VM 722 Response Rate	34/138	31/138	23/138	32/138	25/138	21/138
VM 616 Response Rate	~	~	29/138	46/138	22/138	8/138
VM 618 Response Rate	~	18/138	21/138	89/138	24/138	7/138

**Table 4. DVM Student Survey - Rating (Response Rate shown in Table 3) -**

The instructor created an environment that was conducive to learning - Mean Rating 1.6±0.08

Course -Year (1-5 scale, 1 strongly agree)	2014	2015	2016	2017	2018	2019
VM 722 Rating	1.50	1.52	2.35	2.00	1.55	1.71
VM 616 Rating	~	~	1.12	1.51	1.36	1.20
VM 618 Rating	~	1.44	1.52	1.80	1.42	1.71

**Qualitative Course Survey Data - Summarized by topic and course/year**

**Class expectations and learning objectives are clear, examinations are fair, and students develop new active learning strategies.**

- This class taught me an entire new way of learning. While I am great at memorizing, there was so much information in this class, that strategy had to be built upon. I learned how to draw out pictures, create full systems, and be able to synthesize a lot of information. This classes helped me to become a better student in my other classes too. I have never had to study for this many hours before exams or spend so much voluntary time, outside of class, to get the grade I wanted. I had to toughen up this semester. **(BMS 305 SP19)**
- As a course designed to replicate veterinary school anatomy (as most taking the class are planning to go to) I believe the learning expectations were amazing for the class level. **(BMS 305 SP19)**
- It seemed like A TON of things we needed to know at the beginning of the course, but considering the scope of anatomy and all the things we could have learned, I think the expectations were reasonable. I appreciate that the main muscles, attachment points, and innervations were stressed over learning every single detail that would be less helpful to remember in the future. **(BMS 305 SP19)**
- The teachers have been incredibly helpful and understanding of how the coursework is to students. They have also given as many resources as they could to help us succeed. There has been anatomy programs, pictures of posters that have been hung up in lab, open lab. The teachers have been completely honest with the students the entire time, they have been able to connect with us and encourage us to continue to work hard. I have felt completely supported throughout the course. **(BMS 305 SP19)**
- I enjoyed very much each session that we had with her because I felt that it was very hands on and it was techniques that are very important for our careers. **(VM 795 SP19)**
- Objectives made course learning expectations very clear, and Dr. Magee specifically was very good at mentioning important "take home" concepts in lecture. **(VM 618 F17)**

- The cumulative portion of the final exam was my favorite testing style. Everything was finally integrated, but they were independent enough that you didn't fail a whole swathe of questions if you couldn't remember one of the answers. Thank you! (VM 618 F18)
- The objectives were extremely helpful in this aspect, and the teachers always strove to be clear about this (VM 618 F19)
- I felt the exams did a good job of representing the important objectives and take aways from material learned in class. (VM 618 F19)

### Feedback is in the course is timely and the learning environment is supportive

- I performed very poorly on the first lab and lecture exam, I was able to progress and get some of the best grades I've received in a difficult class because of the feedback and support. (BMS 305 SP19)
- I think the feedback was good, the grading was made clear, and the teachers always communicated with us. (BMS 305 SP19)
- I believe this class is fantastic as is and I do not see anything that could be better as it is already amazing. (BMS 305 SP19)
- You guys provide us with so many tools to succeed in this class. Between the professor interactions to 20 TA's to hours of open lab, this course was set up for us to have the time and resources to do as well as we wanted to in this course. You pointed out areas that people struggled with and made sure to make clear what you wanted from us. You owned up to mistakes you made, everyone was included and you were right there on the floor with us (BMS 305 SP19)
- Y'all did a great job of getting us feedback. It was remarkably fast and very appropriate for how the class was paced. (BMS 305 SP18)
- Each exam, quiz helped me understand my weak parts and help me thrive (BMS 305 SP18)
- You have the opportunity to discuss the quizzes and exams with the professors and TA's which I often utilized and found helpful. During those times, you can ask what was wrong with your answer and how you can improve in the future. (BMS 305 SP18)

### Teaching style is energetic, organized, and supportive

- She was very supportive and made a lot of the events very useful such as the horse head lab with nasal tubes, the nerve block lab and the hanging animals. (VM 795 SP19)
- I really appreciate all of Dr. Magee's efforts to get us amazing guests and learning opportunities! (VM 795 SP19)
- I really like the way she integrated first-year Concepts into her case, as none of the other Capstone lectures really did that. I think she probably could have prioritized the pharmacology of the case a bit more heavily to help Drive some of the concepts home, but I think it was well structured and entertaining. I appreciate that she keeps her energy up because that school has really beating me into submission lately and it's refreshing to learn from someone who is passionate about the material and our education. (VM 722 F18)
- I loved her demonstrations! Our use of mnemonics and various memory building methods were very helpful and I learned quite a bit! (VM 616 F18)  
**Reflection: Everyone needs to learn the equine ascending colon dance.**
- Very passionate about her job. Equine: demo was especially helpful and I enjoyed it a lot. (VM 616 F18)
- Dr. McGee is a great professor. She is extremely knowledgeable and always super helpful In lab. I loved her sense of humor this semester as well! (VM 616 F18)
- You are a very intense person but I do appreciate your high energy to keep spirits up for the last week of school. (VM 616 F19)
- The objectives were extremely helpful in this aspect, and the teachers always strove to be clear about this (referring to the "take home" message) (VM 618 F19)
- I enjoyed this course and learned A LOT. Especially when the organ systems aligned with anatomy (VM 618 F19)
- I really enjoyed the footnotes in the power points, it made for more clear and well-rounded studying and understanding of each topic. I enjoyed her stories from practice, it really put some things into perspective and was a nice reality check. (VM 618 F19)
- I learned very well with Doctor Maggie's style. She covered some difficult topics between endocrine signaling and the pulmonary system, but her energy and humour helped with staying engaged and remembering the highlights of each topic. (VM 618 F18)
- Doctor McGee's lectures were always engaging and exciting. She had some of the most difficult material but she did a great job teaching it to us. If the class was confused she would stop her lectures and help resolve our confusion before continuing which I really appreciate it! (VM 618 F18)
- Dr. Magee is always clear with her material and the energy she brings to a classroom makes it very easy to understand and pay attention to the lecture. (VM 618 F18)
- You are my idol, thank you for being a fantastic professor (VM 618 F18)
- Dr. Magee is a great teacher and very enthusiastic about what she is teaching. (VM 618 F18)
- Dr. Magee's sections were the best!! Some of the best classes of this semester honestly. She was very energetic and enthusiastic, which kept me not just awake but actively listening and engaged. Dr. Magee is also extremely knowledgeable about endocrinology but at the same time knows how to portray the information in a way we can understand. I wish she taught more of the class, her lectures were the best! It also helped that endocrinology is a very fun subject. (VM 618 F18)
- Dr. Magee had great examples and taught in such a lively manner that was very helpful to learn the material. However, sometimes she did get caught up in some details that made it hard to determine key takeaways. (VM 618 F17) **Reflection: Vet students are an interesting group - they want details about their area of interest, but often not someone else's. I've gotten better about telling specific students that we can discuss details or a case that they've seen outside of class time, as well as just staying out of the weeds in general.**
- I love Dr. Magee's lectures!! I also love the notes she puts at the bottom of her power point slides: that really helped me in my studying and I wish other professors would use that method as well.
- I really enjoyed Dr. Magee's energy and pace during lectures, and I feel prepared from her material not just going into exams but going into clinical application which I greatly appreciate. I will say that because of my background I had 0 knowledge about reproductive physiology and found that segment impossible to follow until another student led a review. I'm really grateful that Dr. Magee introduced the topic here instead of leaving it to future classes, but I know that a handful of us desperately needed that extra review and in the future you might consider offering something along those lines as either preparation or review (VM 618 F17) **Reflection: Scheduling review sessions with students outside of class time is challenging and after struggling with one-off requests for extra sessions, we've designed the DVM Tutoring program to provide this support.**
- Dr. Magee is an incredible teacher. She does her best to create an environment that is stress free and best for learning. We took very small breaks throughout class that we a great time to take a deep breath before moving on. Her slides and material were fairly clear about what was most important but sometimes they could be overwhelming because it was not always clear what information was most important on each slide. She mentioned putting notes with each slide that had the take home message but I often felt that even that was somewhat difficult to understand. (VM 618 F17) **Reflection: I have reworked the slides and the notes in the bottom of the slides to differentiate TakeHome vs. Background content, as well as incorporated more applied, clinical examples in to the unit.**
- Dr. Magee is great at engaging the class and giving applicable examples of the course material, but sometimes I feel lost in her examples that I don't understand the actual material outside of that one specific example. I feel like a lot of the material (and her notes) is disorganized and confusing. I am also distracted by all the memes! Sorry, I know they are meant to wake up the students, but...what was I learning again? (VM 618 F16)  
**Reflection: The memes are used to transition between topics and/or regroup mid-50 minute session. Further study is warranted as taking**

**short breaks in the form of videos has been shown to improve students' affective states (Kogan et al. JVME 2018). Additional clinical examples have been added since 2016.**

- Dr. Magee was very helpful and willing to take extra time to go over difficult concepts. I really appreciated how much time she dedicated to us and that she brought us candy! I also think it would be helpful if she could do a little more on the board than just having PowerPoints. I did enjoy that her powerpoints had notes with lots and lots of background information. That was very helpful to read if I was struggling with a certain concept. (VM 618 F15)
- Dr. Magee's lectures were all very organized and straightforward. The information she presented, compared to all of the lecturers, seemed to flow the most logically. Her practice questions she gave during lecture were very useful in preparing for exams, and her exam questions were very fair and straightforward. I enjoyed her lecturing style, as she was very engaging and very to the point. She truly went above and beyond, holding multiple reviews for students before the exam, and I know that made a difference to a lot of us! (VM 618 F15)

## **VM618 Pulmonary Physiology 2017/2018**

- The only thing that I would say should be changed is how pulmonary physiology is taught. Dr. Frye is a very mathematical learner, and the things that she teaches (even though we think in different ways) makes sense the way she teaches them. Dr. Magee is a very visual learner, and the things that she teaches make sense the way she teaches them. In both cases, things make sense to us because we are being taught in a way that makes sense to the instructor. So I do want to preface this by saying both instructors are very talented and phenomenal. (VM 618 F18)
- Pulmonology was highly confusing. A more math based approach instead of conceptual would help. The material was presented too much as theory, instead of cause/effect, or analytical. (VM 618 F18)
- Dr. Magee is a great instructor, and when she taught neuro and endocrine it made a whole lot of sense, and I would have put "strongly agree" for everything--if it weren't for pulmonary physiology as a whole. However, the parts of the pulmonary physiology lectures that really worked well were the ones where she brought in balloons and showed us how negative pressure works--the ones that she taught us using her visual learning method. And again, those parts worked well. (VM 618 F18)
- I thought I learned more when she did presentations during group tutoring sessions than in lecture. She talked about what she did to learn concepts in physiology, but she did not often apply those same concepts to her teaching style. The slide were often excellent suplimental material, but I think if she taught us more in the way and process she took to learn it, the material might be easier to follow. (VM 618 F18)
- It was an egregious disservice to our education to have her teach this topic. (VM 618 F18)
- I do think that the "modules" for respiratory physiology were confusing and I wish the information in those was lectured on first before we had the quizzes. (VM 618 F17)
- Pulmonary physiology was a mess! Dr. Magee would get confused and state things incorrectly and then struggle to fix the mistakes. I spent most of the section teaching myself because it was hard to get through. (VM 618 F17)
- The only thing I would change is how pulmonary physiology was taught. I find how Dr. Bowen taught GI to be very helpful and I think that if pulmonary was taught in a similar manner (on the board) I would have more easily understood the material. I understand that there is a lot of math so also doing problems in class more would be helpful I think. I ended up looking on YouTube to completely understand the material. (VM 618 F17)
- I thought it was very apparent that Dr. Magee had not taught the respiratory unit before and I feel like her's and Dr. Frye's teaching style and test questions are very different from each other and this made the respiratory exam very difficult. (VM 618 F17)
- I enjoyed learning from Dr. Magee, her powerpoints have helpful notes on them and she made it clear what large concepts she wanted us to grasp. For pulmonary I had a harder time both following her and figuring out how to study the material. The practice questions she wrote were helpful, and I think it would be helpful in the future if there were more of those that reflected the type of questions that were on that exam. (VM 618 F17)
- **Reflection:** I took on the 11 lecture Pulmonary Physiology unit from Dr. Melinda Frye in 2016 and was prepared to deliver it when my father became unexpectedly ill and died 4 hours in to the unit. Dr. Frye graciously completed the unit for me. 2017 was my first time teaching the unit all the way through and it was a challenge. Despite careful preparation and a positive attitude before each class, I was turned around and felt battered by the end of each session. Looking for guidance, I asked Dr. Andrew West for a Peer Review (see Appendix) and his perception of the lecture hour was positive and very helpful. This unit in 2018 felt exponentially better. As suggested by Dr. West, I used the board to draw more concepts and integrated more clinical cases, but it was still not on par with my endocrinology and cell biology unit. Dr. Frye uses a more mathematical approach to the cardiovascular unit and I had integrated that with my more conceptual approach in the pulmonary unit. The pulmonary physiology unit was taken on by the anesthesia faculty in 2019 and although it was well received, cardiopulmonary physiology in general - and mathematical vs. conceptual learning styles - continue to be a challenge in this course. In the move to online teaching Fall 2020 in response to COVID-19, the teaching team continues to evolve accessibility to the subject matter and align our teaching with our DVM Curriculum Renewal to provide learning opportunities for different types of learners.

## **VM618 Exam 3 - Fall 2017 - Course Organization and Leadership**

- Overall I thought her objectives were extremely well-written, but the pulmonary objectives made me want to kick a chair. "Name the 3 contributors to..." felt incredibly arbitrary (I usually felt like I could name 12), and I was even more dismayed to find this on the exam. I hope this feedback does not read as excessively negative, as I would like to convey just the opposite. I really enjoyed Dr. Magee as an instructor and I feel like I learned more from her in this one course than I have in potentially the rest of my education up to this point. (VM 618 F17)
- The same exam was too long - while most people finished the other exams with 30-40 minutes left, many people struggled to even finish the respiratory/GI exam. (VM 618 F17)
- Dr. Magee's first section of info (endocrinology), I was really able to follow her ideas, understand PowerPoints, etc. The respiratory section was very difficult to follow though, which is why I put a 3. I am not sure if it was more I struggled to grasp the concepts or if I just couldn't follow her style for that material, but I found it incredibly difficult to understand those lectures. I found myself and others teaching one another the material which we had not grasped from her in lecture. I also had serious issue with how she addressed the class after the disaster that was exam 3. When she received numerous emails about how dozens of students were given additional time, she came to the class to "apologize", during which she said that those who spent extra time were not honorable. I had serious issue with this statement, as she was overheard by several students asking the other professors when they should "cut off" those given extra time. She was well aware that people were taking extra time, but she seemed to imply that she was not. I also feel like an apology was not the best way to address this issue. Remedial action should have been taken. An apology does not fix our badly skewed grades (VM 618 F17)
- **Reflection:** As a new course director, I began working with the VM618 course learning objectives and ensuring equal weight distribution of the lectures to exam questions/points. In 2017, this resulted in several additional points in the form of new questions on the GI/pulmonary exam, and a test that many students struggled to complete in the 2 hour session. Previous course leaders had allowed students a few extra minutes (sometimes up to 30m) beyond a test session and miscommunication at the conclusion of the exam period resulted in the proctors (including myself) leaving a cohort of students taking a "few extra minutes" in a conference room. These students effectively had an extra hour to complete the exam, which theoretically was a violation of the Honor Code, but the students claimed that they thought that they were being allowed this extra time. There was no way to undo or fix what happened. The exam was followed by Fall Break. Despite my efforts to communicate with students over this period, their anger escalated and upon our return from break my attempt at an apology,

ownership as Course Director of the mistake, and explanation of policies moving forward, was not well received. We now have a strict proctoring policy with no extra time unless you have approved accommodations, and I split the units in the course up to add an extra exam and make each exam more reasonable in a 2 hour period. We also continue to refine course learning objectives and align them throughout the DVM curriculum.

#### **Comments from Peer Review of Teaching (2015 and 2017)**

- **Dr. Andrew West, VM618 Pulmonary Physiology lecture hour - 2017:** *You seamlessly adjusted your instruction based on student confusion (the students had looks of confusion, so you re-drew the ideas on the whiteboard to clarify and explain it differently). This flexibility of instruction, based on feedback from students, is very helpful for supporting student learning. You intentionally made sure that you understood student questions before giving an answer or response. This is very helpful, as it ensures that you are answering the question that was actually asked and that it encourages students to ask more questions because they know that their questions are valued. Throughout the lecture, you toggled between the PowerPoint presentation and the dry erase board. This was an effective strategy, and one that I do not see very often. It wasn't that you used the dry erase board as an afterthought for bringing clarity to ideas (most common), but instead, planned the lecture so that the PowerPoint served as the outline and medium for housing text and images, while the whiteboard served as your medium for explanation. If you have not already asked students, it would be fascinating to know how they feel about this strategy. I suspect that they like it very much.*
- **Dr. Sherry Stewart, VM618 Endocrinology lecture hour - 2015:** *Pacing good; enthusiasm at first came across as a bit rushed, but that stopped about 5-10 minutes into the lecture, especially with use of lots of embedded questions, from review of previous material, to "Have you ever seen this in practice," to a brief pause for a funny transition to another topic. After presenting major concept stopped, asked how students were doing, then asked a series of about 3 questions over the topic she just covered -- excellent!*
- **Dr. Andrew West, VM618 Endocrinology lecture hour - 2015:** *Nice job asking lots of questions and allowing students to respond! I wonder if you might be able to incorporate a few more higher order think questions? Maybe give them a few seconds to talk to their neighbor and respond? I love that you integrated the case!! What if you gave them a few seconds to talk to each other about the 'why it's a problem'? Can you think of any way to incorporate even more critical thinking types of strategies in the lecture?*
- **Reflection:** *I continue to explore strategies incorporate higher order thinking to learning objectives and assessments and integration of concepts. In 2019, I introduced a Team-Based Learning exercise to facilitate this in a more structured manner during acid-base unit.*

#### **D.1b. DEVELOPMENT OF ENDURING EDUCATIONAL MATERIALS:**

##### **Books:**

Fails AD and Magee C. 2018. *Anatomy and Physiology of Farm Animals*. 8<sup>th</sup> Edition. Wiley. Reviewed in JAVMA (Vol. 255 No. 6) Reviewed by Shireen Hafez, DVM, PhD, University of Illinois, Urbana, IL. "This book will be an invaluable resource for animal science, veterinary technician, and preveterinary students as well as instructors because it is well organized and easy to understand and contains reasonable details... Preveterinary students will especially appreciate the unique addition of clinical examples that correlate to basic anatomy and physiology, which have been incorporated into some parts of the book."

##### **Other Works:**

**Virtual Animal Anatomy (VAA)** is a suite of virtual animal anatomy (canine, feline, equine, bovine) software programs produced by the Virtual Veterinary Education Tools (VVET) group within the College of Veterinary Medicine and Biomedical Sciences. Designed as a virtual atlas for use in all areas of domestic animal anatomic instruction to enhance student learning and availability of instructional materials given the challenges of maintaining a cadaver laboratory and staff (<http://www.cvmbs.colostate.edu/vetneuro/index.html>).

- **2012-present** I have led efforts to secure extramural funding from USDA and NSF, completed learner outcomes analyses of educational interventions, as well as the dissection, image acquisition, and annotation of the *Virtual Equine Anatomy*, *Virtual Feline Anatomy*, and *Virtual Bovine Anatomy* programs. This work is completed with the assistance of 2 part-time developer/programmers (Linton/Garrett), 2-3 student employees working full-time during summer months and 10-20 hours work/week during the school year, and anatomy faculty in BMS.

##### **- My specific contributions to VAA development include production of the following:**

- **Virtual Equine Anatomy**
  - *thoracic limb osteology and annotation of dissection (2013)*
  - *pelvic limb dissection and osteology (2014)*
  - *head dissection and skull osteology (2015)*
- **Virtual Bovine Anatomy**
  - *pelvic limb osteology (2018)*
  - *thoracic limb osteology (2018)*
- **Virtual Feline Anatomy**
  - *skull and mandible osteology (2019)*
  - *thoracic limb osteology (2019)*
  - *pelvic limb dissection and osteology (2019)*

**- My specific accomplishments as Program Lead (2018-present) include:**

- Completion of the **CSUVentures Research to Market** program to improve my understanding of VAA's value proposition, target market, and market potential. Resulted in **Invention Disclosure (INV18-084)** for the Adobe Flash version of the program has been used to generate more than \$25,000 in individual program sales since August 2018.
- **VAA-LTI** - I initiated development of this HTML5 coded version of the software program to facilitate a subscription model of Software as a Service to other universities using a secure learning management system and a Learning Tool Interoperability (LTI) standard.
  - Since May 2019, VAA-LTI has generated \$12,000 of direct income to CVMBS with plans to launch a single user subscription service in August 2020 <https://virtualanimalanatomy.colostate.edu/vaanopcomm/>.
  - Current funding for VAA comes from the DVM program (\$25,000/year) and total faculty/staff BMS subsidized input to VAA program development is approximately \$250,000/year with the intention of creating a self-sustained financial model based on subscription services and limited use licensing of the 3D VR assets. **My goal as Program Lead is to have VVET financially independent by 2023.**
- **Collaborations & Engagement**
  - 2017, Faculty at the **University of Hokkaido in Japan**. As of March 2020, they have completed the translation of the program text to Japanese. We are in the process of coding this translated version to launch October 2020.
  - 2019, William Pérez, PhD, Professor of Anatomy at **Universidad de la República de Uruguay** and President of the World Association of Veterinary Anatomists. As of February 2020 the Spanish translation of the program was completed and we are in the process of coding this translated version for launch Summer 2020.
  - 2020, **UCDavis School of Veterinary Medicine**, Development of 3D VR assets and evaluation of VR in DVM teaching, invited talk at UCDavis January 2020

“BMS305/531 Domestic Animal Gross Anatomy Lecture and Laboratory Manual” 5th Edition, Spring 2020. Laboratory objectives for BMS305/531 are complemented in the manual by brief “tours” describing anatomical relationships and figures designed for interactive classroom and laboratory learning.

“Suture Clinic” – Canvas-based flipped-classroom type teaching module utilized by the BMS Anatomy Camp (2016/17), MS-B Pro Café (2016/17), and Pre-Vet Club (2016) for suture skills event programming.

**D.1c. EFFORTS TO IMPROVE TEACHING, FACULTY DEVELOPMENT, & CE FOR ANATOMY TEACHING (5 years):**

2019 – CVMBS Inclusive Pedagogy Training Participant, Fort Collins, CO. ***Through this experience I have modified all of my course syllabi and my advising, teaching, and mentoring practices to include principles of equity and inclusion. Program included sessions in the following:***

- Who are you Teaching-The Identity of Your Students
- Who you are- Assumptions and Biases of the Instructor
- How are you Teaching- Pedagogy and Praxis- Part 1
- How are you Teaching- Pedagogy and Praxis- Part 2
- What are you Teaching- Examining Your Curriculum

CVMBS Teaching Academy Seminars, Fort Collins, CO

- Strategies for Making the Most Important Ideas in a Lecture Clear to Students
- Conversations About Medical Education: Team Based Learning (TBL) - ***I developed a TBL activity for the acid-base unit VM618. Although students enjoyed the applied activity, it was not part of the original course syllabus and therefore was not worth points, so despite encouragement to prepare, students did not do the pre-work. Additionally the WiFi in our lecture hall was out that day and feedback during the session was impeded. TBL will be formally incorporated in VM618 Fall 2020.***

CSUVentures State of Innovation: Education Series - Considerations for Protecting Intellectual Property for Software, AI, & AR/VR Applications by Bob O'Loughlin. Fort Collins, CO.

Colorado State University's 80th Annual Conference for Veterinarians. Fort Collins, CO.

Regional Teaching Academy VETS 2.0 Curriculum Development Workshop, UC Davis, CA. ***I used this workshop to develop clinical case studies for a future UG Food and Fiber Animal Anatomy course.***

Society for Theriogenology Meeting, Savannah, GA

- 2018 – “Research to Market” Commercialization of Virtual Animal Anatomy (Role: PI) with CSUVentures, Fort Collins, CO  
Animal Reproduction and Biotechnology Student/Staff Strength Deployment Inventory (SDI®) Workshop  
Colorado State University's 79th Annual Conference for Veterinarians, Fort Collins, CO  
“Mindset for Supervisors” – 4h CSU Supervisor Training Foundation Course based on Clifton's StrengthFinders  
“Rules of the Road” – 4h CSU Supervisor Training Foundation Course reviewing HR and OEO regulation



- “Systems Thinking: Your Role in the Big Picture” – CSU Supervisor Training Certification Course  
 “Effective Communication and Conflict Resolution Skills” – CSU Supervisor Training Elective Course  
 2017 – Colorado State University CVMBS Fall Education Seminar “Utilizing Adaptive Instruction and Adaptive Assessments in CVMBS”, Fort Collins, CO  
 2016 – Society for Theriogenology Annual Meeting and Teacher’s Conference, Baltimore, MD  
 Colorado State University’s 77<sup>th</sup> Annual Conference for Veterinarians, Fort Collins, CO  
 2015 – Colorado State University’s 76<sup>th</sup> Annual Conference for Veterinarians, Fort Collins, CO  
 Communication Coaching Skills Workshop, Fort Collins, CO. This 2-day program is designed for practitioners, communication teachers and other educators responsible for coaching individuals or teams, facilitating small groups, supervising colleagues and conducting in-the-moment coaching for hospital or clinic teams.

**D.1d. TEACHING HONORS AND AWARDS:**

- 2013 *Teaching Fellow*, Awarded by The Institute for Teaching and Learning (TILT) at Colorado State University. The TILT/Reinvention Center Science of Learning Course Development Competition is an ambitious effort to enhance learning, increase engagement, and promote pedagogical innovation through the redesign of undergraduate courses. Application submitted by faculty must be supported by the department head. I used this award to re-design BMS305 and create a programmatic vision for animal anatomy instruction in BMS. This work included extensive study of Learning Ecologies in BMS305 and factors that influence student success. Findings were presented at the CSU TILT Professional Development Institute (PDI) in 2015 and used to shape the COVID-19 Learning Ecologies survey in 2020. Using this experience, I continue to execute that vision and implement new strategies to achieve student engagement and success.

**DOMAIN 2: MENTORING AND ADVISING**

**D.2a. ADVISING:**

**UNDERGRADUATE STUDENTS:**

*Undergraduate Senior Honors Thesis*

- Lexxee Weilson, Fall 2020 – “Building teaching models for equine biomechanics” In progress  
 Jordan Sandoval, Fall 2019. “Comparative Anatomy of High Altitude Disease in Camelids and Bovids”  
 Sera Lee, Spring 2018. “Owner Satisfaction with Canine Orthotic Device Use” **Manuscript in preparation**  
 Jordan Tarbutton, Fall 2018. “Bovine Claw Zone Anatomy as VR Outreach Tool” **Preliminary data for USDA NIFA HEC grant "Virtual Bovine Anatomy"**  
 Marion Steiblen, Fall 2018. “An Equine Medicine Case Study – From Dystocia to Discharge”  
 Carli Evtz. Spring 2017. “Equine Dentistry: A Case Study”  
 Rowan Seabolt, Fall 2017. “Establishing and Characterizing Transgenic Mice Expressing a Firefly-luciferase Reporter Driven by the Ovine GnRHR Promoter” **Manuscript in preparation.**  
 Sabrina Litzelman, Fall 2017. “Comparison of Protocols and Standards of Care with a Spectrum of Veterinarians”  
 Ellie Beniston, Fall 2017. “Diabetes and Uveitis: A comparative analysis of causes, connections, and treatments in canids and humans”  
 Shelly McDaniel. Fall 2016 “Social Media and the Equine Industry.” **Accepted for publication in JEVS May 2020.**  
 Hunter Kothenbeutel. Fall 2016. “A Comprehensive Review of Onychectomy (declaw) of Domestic Cats”  
 Alyx Moose. Spring 2015. “Surveying the Potential Use of Shelter Animals for Service Function”  
 Alyssa Carson. Fall 2015. “Uterine Torsion in Llamas and Alpacas: Review Study and Design”  
 Katherine Watts. Fall 2015. “He Made Their Glowing Colors, and Made their Tiny Wings: Short Stories of Veterinary Medicine”  
 Amy Scott. Spring 2014. “BMS305 Reference Manual: Comparative Anatomy of the Canid, Equid and Bovid; Developing Teaching Aids for a Comparative Approach to Anatomy”  
 Sophia Nelson. Spring 2014. “A Comparative Analysis of Adjunct Therapies in Equine Sports Medicine”  
 Katherine Yunker. Spring 2014. A Comparison of Fixation Techniques for Diaphyseal Femoral Fracture in Canids”  
 Hannah C. Lewis. Spring 2014. “Branching of the Abdominal Aorta and Symptoms Related to Blocked Blood Flow Restrictions”  
 Kelsey Jung. Fall 2013. “Revealing the Role of Estrogen Receptor alpha (ER $\alpha$ ) via Adenoviral Delivery of siRNA for Knockdown of ER $\alpha$  in Gonadotrope Cells”  
 Brandi Heckel. Fall 2012. "What Domestic Ruminant Anatomy Tells Us About Feeding Wild Cervids"  
 Nicole Mikoni. Fall 2012. "Femoral Fracture Repair"

**GRADUATE STUDENTS:**

*PhD Advising:*

- Primary PhD advisor for *Jason F. Martin* (DVM 2020), PhD program begins Summer 2020 and research will focus on the impact of virtual reality on learning outcomes in animal anatomy.

Viviane C Leite Gomes. PhD student in Clinical Sciences at Louisiana State University, Baton Rouge, LA. Primary Advisor, Jenny Sones, DVM, PhD, DACT. 2019-present. Combined PhD/Theriogenology Residency program. Interest in kisspeptin during equine pregnancy. Dr. Gomes visited CSU in May 2019, I visited LSU in November 2019.

MS-B: Department of Biomedical Sciences Avg 16 students/year, 2012-ongoing. Primary academic advisor for all animal anatomy concentration students. This includes admissions, student support, mentorship, and grading of annual Comprehensive Exams. Students are typically hoping to demonstrate academic capacity to DVM admissions panels. 62 of 112 MS-B animal anatomy students from the last 7 years have gone on to veterinary school

MS-A Committees:

- S. Salman (Animal Sciences, 2018-2019, PhD started 2019 at University of Connecticut).
- S. Nelson (Student Affairs in Higher Ed, 2015-16, CSU DVM 2020).

### **D.2b. LETTERS OF RECOMMENDATION:**

10-15 annually since 2012. I have students complete a reflective packet and meet with me as part of this process. Letters of recommendation for former undergraduate, graduate and DVM students have contributed to more than two dozen veterinary students or veterinary practitioners, including 1 equine surgical resident (Ashley Cameron), 2 small animal surgical residents (Jennifer Kuzminsky, Kaitlyn McNamara), as well as:

- 1 [PEO Scholar \(Nora Jean Nealon, PhD 2019, DVM expected 2021\)](#)
- 1 [USDA-APHIS Pathways intern \(Austin Brewer, DVM expected 2021\)](#)
- 1 animal anatomy instructor at CSU (Mr. Andrew Garrett)
- 2 PhD students at CSU (Jason Martin, Emily Castellanos)
- 2 PhD students not at CSU (Saleh Salman, Kate Bates)

### **D.2c. OTHER EVIDENCE OF ADVISING EXCELLENCE**

2017-2019 - Nomination for [Jack E. Cermak Advising Award](#). This is a Colorado State University award that recognizes excellence in academic advising. Individuals are nominated by students and their college. Jack E. Cermak was a Professor in Civil Engineering who endowed this award because of his strong belief in the value of academic advising.

## **DOMAIN #3: LEARNER ASSESSMENT / OUTCOME ASSESSMENT**

### **D.3a. LEARNING ECOLOGIES**

In collaboration with The Institute for Learning and Teaching (TILT) at CSU, I conducted 2 year's worth of comprehensive surveys to assess the Learning Ecology (reviewed by A. Richardson in 2002) of the BMS305 Domestic Animal Anatomy experience. This study utilized pre-course and post-course surveys in 2014 and 2015 to quantify the learner's definition of success, attitude towards the subject, self-efficacy/confidence, engagement, student-instructor and student-student interaction, communication, challenge, critical thinking, technology, availability and utilization of resources. Findings included that high grade (A, B) students spent **less time** overall per week than low grade (C,D,F) students; but they spent **more time** on Open Lab, Lecture Echoes, and the VCA. Specifically, 'A' students spent **significantly** more time in **Open Lab** than the rest of the students in the class (4.5 vs. 2.9 h/wk and 'A' students found written and video **Tours** and **Open Lab** time **more helpful** than 'B' students. These 'A' students used all of the Virtual Anatomy Programs more than the rest of students **before** and **after** open lab each week. Additionally, high grade Students were **more engaged**, had better **self-efficacy**, and paid more attention (all self-reported) in class. The 'A' Students were also far **more confident** in their self-assessed abilities. These findings were presented to the 2015 TILT Professional Development Institute Workshop "Assessing Course Quality" at Colorado State University. The self-reported use of the VCA resulted in quantitative assessment of Virtual Animal Anatomy program use in BMS305 and presentation of these findings in 2019 at the RTA and AAVA meetings. Investigation into "confidence" also resulted in the study of BMS305 students' spatial skills using a spatial rotation test - these findings are in preparation for publication. These data also support the use of a technology based, blended learning environment in animal teaching and have been used to create software development strategies for implementation of the Virtual Animal Anatomy program.

Reference: Richardson (2002) An Ecology of Learning and the Role of eLearning in the Learning Environment: A Discussion Paper. In *Connecting the Future: Global Summit of Online Knowledge Networks*, education.au limited, Dulwich. [Link](#)

## **DOMAIN #4: EDUCATIONAL RESEARCH & SCHOLARSHIP**

### **D.4a. PUBLISHED WORKS (Refereed Journal Articles):**

- Linton A, Garrett AC, Ivie KR, Jones JD, Martin JF, Delcambre JD, **Magee C**. Enhancing anatomical instruction: Impact of a virtual canine anatomy program on learning outcomes. *Anatomical Sciences Education*. ASE-20-0024. Submitted January, 2020. *Under Review*. (Manuscript Proof in Appendix)
- Hall H, **Magee C**, Clapp T. 2016. 4-Step Model to Approach Case-Base Learning in the Classroom. *Journal of Adult Education* 45:24-27.

### **D.4b. CONTRACTS & GRANTS (Applications Submitted, decisions Pending as PI)**

#### **Contracts**

##### **Virtual Animal Anatomy – SAS - LTI Subscription Software**

San Joaquin Valley College – 5/19 (12mo) \$3,000/yr

University of Pennsylvania – 9/19 (12mo) \$3,000/yr

Medialle College – 9/19 (12mo) \$3,000/yr

Georgian College – 11/19 (12mo) \$3,000/yr

-From March 17-July 1, 2020 the program was provided for free in response to COVID-19. More than 100 schools (K-12, undergraduate, and professional veterinary and technician programs) from around the world have been provided access to the LTI. Many of these users are obtaining subscriptions for Fall 2020.

##### **Virtual Animal Anatomy (3D VR Software) - Limited Purpose Software License**

Mars, Incorporated. Mars Petcare (Future of Technology, Pet Health and Innovation)

International Network for Humane Education (InterNICHE). Program promotion and distribution of humane alternatives in education <http://www.interniche.org/cs/node/5941>

#### **Externally-Funded Awards as PI**

2020-2022 “Virtual Bovine Anatomy: Pelvic Limb” \$150,000 *USDA-NIFA Higher Education Challenge*. Primary Objectives: 1) development of a 3D VBA Pelvic Limb module for DVM education; 2) the creation of an UG Applied Food Animal Anatomy curricula; 3) engagement of UG and DVM students in learning, teaching, and outreach activities

#### **Internally-Funded Awards as PI**

2019-2020 “Development of a Curricular Mapping Tool” Role: PI, \$14,800. *Colorado State University Provost’s Digital Learning Initiative*. Collaborative proposal with faculty from LIFE102, CVMBS BMS, MIP, ERHS, CSU DVM, and UC Denver medical program. The specific project deliverables include: 1) a curriculum map of BMS and LIFE102 student learning objectives; 2) a searchable database of BMS/LIFE102 student learning objectives; 3) course staffing information related to percent efforts and types of teaching for each course.

2013-2014 “Development of a Virtual Bovine Anatomy Tool” Role: PI, \$23,500 *College Research Council*, CVMBS, Colorado State University, Fort Collins, CO

#### **Applications Submitted but not Funded as PI**

2019 USDA-NIFA Higher Education Challenge “Virtual Bovine Anatomy: Pelvic Limb” \$150,000 Role: PI Primary Objectives: 1) development of a 3D VBA Pelvic Limb module for DVM education; 2) the creation of an UG Applied Food Animal Anatomy curricula; 3) engagement of UG and DVM students in learning, teaching, and outreach activities – Reviews very positive, but application numbers have doubled in the last 2 years.

Science Education Partnership Award (SEPA, R25 PAR-17-339, Limited Submission by CSU). “Fostering Diversity and Capacity in Biomedical Sciences and Veterinary Medicine through Outreach and Engagement.” \$1.25M/5y Role: PI; Co-I: Gilbert John, PhD. Primary Aim: to integrate the broad outreach activities in the CVMBS by scientifically evaluating current programmatic efforts, expanding impact, advancing collaboration, strengthening infrastructure, and broadening participation. – Interest from CSU Systems office to fund National Western Center related activities

2018 “Virtual Bovine Anatomy: A One Health Tool” Lyle Spencer Research Award. Letter of Intent Submitted October, 2018. \$250,000. Role: PI

“Virtual Canine Anatomy - Spanish Translation” Colorado State University One Health Institute. Grant Submitted November, 2018. \$50,000. Role: PI

USDA-NIFA Higher Education Challenge “Virtual Bovine Anatomy: Pelvic Limb” \$150,000 Primary Objectives: 1) development of a 3D VBA Pelvic Limb module for DVM education; 2) the creation of an UG Applied Food Animal Anatomy curricula; 3) engagement of UG and DVM students in learning, teaching, and outreach activities

- 2015 USDA-NIFA Higher Education Challenge "Virtual Bovine Anatomy: Dissection of the Pelvic Limb" (PASS#122376)  
Co-PI: Roman-Muniz IN, \$150,000 Primary Objectives: 1) Produce the Pelvic Limb unit of the Virtual Bovine Anatomy program; 2) Test the hypotheses that a) use of the Virtual Bovine pelvic limb anatomy will improve student test scores on for the Pelvic Limb unit, b) Virtual Bovine Anatomy will increase student efficiency and motivation while studying anatomy.
- 2014 NSF Application #1504759 "Virtual Anatomy In Undergraduate STEM Engagement" (PASS#120757)  
Co-PI: Whalen LR, \$250,000 Primary Objectives: 1) To create spatial and cognitive skills development programs within the Virtual Canine Anatomy platform. 2) To determine if enhancement of the Virtual Canine Anatomy program improves student learning, enhances engagement, and improve undergraduate STEM engagement.

#### **D.4d. PAPERS PRESENTED and INVITED LECTURES**

- Magee C.** January 2020. "Development of 3D VR assets and Evaluation of VR in DVM teaching." Invited talk at UC Davis School of Veterinary Medicine. Davis, CA.
- Magee C.** July 2019. "Virtual Animal Anatomy in DVM Education." E-Health Summer University. Invited Talk and VR Demonstration. Castres, France
- Magee C.** April 2019. "Anatomical Education using Case Based Inquiry and Virtual Reality." Veterinary Medical Association Executives (VMAE) ThinkWorks Conference. Invited Talk & VAA VR demonstrations. San Francisco, CA
- Magee C.** April 2019. "Virtual Animal Anatomy – VR Education." Veterinary Innovation Summit. Selected start-up presenters. College Station, TX.
- Magee, C.** 2018. "Virtual Animal Anatomy – from Research to Market." BMS Annual Retreat, Estes Park, CO
- Magee, C.** 2017. "Scaffolding Learning in Anatomy: The Pelvic Limb." Tufts University Cummings School of Veterinary Medicine, Grafton, MA.
- Magee, C.** 2017. "Virtual Animal Anatomy: User Experiences and Future Directions." Presented at Daktari Animal Hospital, Tokyo, Japan. University of Hokkaido Veterinary School. Sapporo, Japan.
- Magee C,** Burns S, Johnson D. 2015. "Assessing Course Quality." TILT Professional Development Institute. Workshop. Colorado State University, Fort Collins, CO. ***This workshop reflects the efforts to study the Learning Ecology BMS305, including factors that influence student outcomes in anatomy, as a TILT Teaching Fellow***
- Magee C,** Jensen L, Johnson D. 2014. Development of Student Learning Objectives for Graduate Students within the Context of Program Review. Department of Biomedical Sciences Annual Retreat. Workshop Organizer. Colorado State University, Estes Park, CO.

#### ***Additional Demonstrations of VAA-VR program***

- InterNICHE* - Leicester, England. Nick Jukes, Coordinator – Documentary Interviews (April 2019) Goal of Documentary: Highlight educational practices that reduce or replace cadaver instruction.
- University of Hokkaido*, Anatomy Faculty visit, Fort Collins, CO (March 2019)
- CSU VTH Open House*, Fort Collins, CO (1 day, April 2019)
- CSU DVM Alumni Weekend*, Fort Collins, CO (1 day, April 2019)
- Veterinary Information Network*, Founder Dr. Paul Pion, Fort Collins, CO (1 day, May 2019)
- Therigenology Student Conference*, Savannah, GA (1 day, August 2019)
- CSU BMS MSB Alumni Weekend*, Fort Collins, CO (1 day, September 2019)
- Colorado Veterinary Medical Association Annual Meeting*, Keystone, CO (3 days, September 2019)
- Veterinary Innovation Summit*, Translational Medical Institute, Fort Collins, CO (3 days, September 2019)
- Georgia Veterinary Medical Association*, Fort Collins, CO (2 hours, September 2019)
- UCDavis DVM Program*, Fort Collins, CO (5 hours, September 2019)
- Louisiana State University School of Veterinary Medicine*, Baton Rouge, LA (1 day, November 2019)
- CSU Vice President for Research Demo Day*, Fort Collins, CO (1 day, 2018-19)
- Zoobiquity Conference*, Fort Collins, CO (1 day, 2019)

## **DOMAIN #6: EDUCATIONAL LEADERSHIP AND ADMINISTRATION**

### **D.6a. COMMITTEE SERVICE:**

#### **External to Colorado State University**

2019-present

*Teaching Academy Fellow*, Consortium of West Region Colleges of Veterinary Medicine, member of Faculty Development Working Group, VETS 1.0 and 2.0 Assessment subgroup

#### **College of Veterinary Medicine and Biomedical Sciences**

2019-present

*CVMBS Representative to CSU's Faculty Council* (2 year term)

*DVM Curriculum Renewal Task Force* (5% effort) – my role is to provide basic sciences (anatomy, physiology) and BMS input to proposed changes in the DVM curriculum. Task Force conducts weekly meeting with additional efforts to develop goals (first draft accomplished Fall 2019), assess faculty input (ongoing) and draft a strategic plan in 2020 for DVM curricular changes

2013 – 2019 *DVM Admissions Committee*

2014-2019 Multiple Mini-Interview Committee, Question Development and Interviewer Training – I had a major role in the development of the MMI for CSU through three different Directors of DVM Admissions over the course of 4 years. The DVM applicant is invited to the MMI based on holistic review of their application, and acceptance decisions currently utilize the MMI score (50%) and the holistic packet review (50%).

2015, 2016 Alaska 2+2 admissions selection committee

2014, 2015 WICHE admissions selection committee

2014-2016 *DVM Curriculum Committee*

#### **Department of Biomedical Sciences**

2020

*CSU/CU MD program Educational Special Search Committee*, ongoing

2019

*BMS Department Head Search Committee*, ongoing

*DVM Instructional Technologist Search Committee* (Hired Sonja Berkenpas)

*Director of Animal Anatomy Programming and Strategic Planning*. Faculty and Staff Supervised: Jeremy Delcambre, DVM, MS (Assistant Professor), Robert E. Lee, PhD (Anatomy Lab Coordinator), Andrew Garrett, MS (Instructor, VAA Developer), Andrea Linton, MS (Instructional Designer, VAA Programmer), Brittany Runyan, MS (Research Associate, 20% effort)

2018

*Anatomy Education Strategic Planning*. Effort included bringing in an outside consultant (Cindy Anderson Consulting) and included neuro, human, animal, outreach teams and integration with physiology teaching as the HEOC building, UG umbrella major, and CU/CSU medical program are launched. Ms. Anderson is no longer a consultant of CSU; however, these efforts have resulted in a detailed plan for curricular and program development around anatomy and physiology.

2017

*Assistant Head/Chair of the DVM & Clinical Services Committee*, ongoing

*DVM Lab Coordinator Search Committee*, Chair (Hired Dr. Julie Becker)

2015

*Research and Facilities Committee*, ongoing

2014

*Program Review Committee*

2013

*Graduate Education* Committee, MS-B Steering and Admissions Sub-Committees - ongoing

#### **Department of Biomedical Sciences**

2019 – present

BMS Department Head Search Committee, ongoing

CSU/CU MD program Educational Specialist Search Committee, ongoing

DVM Instructional Technologist Search Committee (Hired Sonja Berkenpas)

Director of Animal Anatomy Programming and Strategic Planning, Department of Biomedical Sciences College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins. Faculty and Staff Supervised: Jeremy Delcambre, DVM, MS (Assistant Professor), Robert E. Lee, PhD (Anatomy Lab

Coordinator), Andrew Garrett, MS (Instructor, VAA Developer), Andrea Linton, MS (Instructional Designer, VAA Programmer), Brittany Runyan, MS (Research Associate, 20% effort)

2018 – present, Along with Dr. Tod Clapp and Cindy Anderson (consultant) led a major strategic planning effort in 2018-2019 for anatomy education in BMS, including neuro, human, animal, outreach, and integration with physiology teaching as the HEOC building, UG umbrella major, and CU/CSU medical program are launched. Ms. Anderson is no longer a consultant of CSU; however, these efforts have resulted in a detailed plan for curricular and program development around anatomy and physiology.

2018 – present Assistant Head/Chair of the DVM & Clinical Services Committee. In this role I am responsible for making recommendations related to teaching efforts, space and budgetary decisions as well as participate on the BMS Executive Council.

Spring 2017 DVM Lab Coordinator Search Committee, Chair (Hired Dr. Julie Becker)

Secured funds and led a \$113,000 facility renovation in anatomy in 2018

2015 – present Research and Facilities Committee. This group helps facilitate space planning and use decisions for the department and College, as well as funding requests for space or equipment needs.

2014 – present Graduate Education Committee. This group contributes to departmental code policies related to graduate education, including admissions and examinations.

2014 – present Program Review Committee. Required by CSU for accreditation, this group of faculty prepares the BMS curriculum and programming for Institutional Research and the CSU Provost.

2013 – present MS-B Steering and Admissions Committees. Recruitment, selection, and program development for MS-B animal anatomy students.

#### **D.6b. OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH (7 years)**

##### *Zoetis Pre-Veterinary Discovery Camp, College of Veterinary Medicine and Biomedical Sciences, CSU*

Planned for summer 2020 but put on hold as result of COVID-19, this camp is in partnership with the Alliance Center at CSU to develop an opportunity for students from diverse backgrounds who would otherwise not have this type of opportunity, to learn about careers in veterinary medicine. Funded by Zoetis, Inc. (\$50,000) the camp is intended to host approximately 20 students for 6 nights, 7 days in the CSU dormitories in the first year, including students from Western Region DVM Consortium states (i.e. California, Nevada, Oregon, etc.). Campers will be paired with an Alliance Summer Institute alumnus as a primary counselor, as well as an anatomy counselor from the CVMBS UG/G/DVM program. Campers will dissect real anatomical specimens, use case studies to understand applied anatomy, study comparative anatomy using virtual anatomy. The Pre-Veterinary Discovery Camp also gives CSU students the opportunity to provide community service by teaching anatomy and mentoring campers. With the help of Heather Hall, I am designing the camp curriculum, and will teach it with support from faculty, staff, and students in CVMBS. Major themes will include: 1) exploration of the veterinary profession, including travel to National Western and exposure to animal models in research; 2) pathways to veterinary medicine; 2) topics in veterinary medicine including debt awareness and repayment programs, wellness, leadership and communication skills

##### *Anatomy Camp, Department of Biomedical Sciences, CSU*

Summer 2016-2019; cancelled 2020 due to COVID-19: This academic camp for high school students uses hands-on learning to create an enriched learning environment. Many campers are considering pre-professional majors in college and the primary goal of the camp is to engage high school students in health education and to encourage their interest in college STEM majors. Campers dissect real anatomical specimens, use case studies to diagnose medical problems, and study cross sectional anatomy using virtual anatomy. Anatomy Camp also gives CSU students the opportunity to provide community service by teaching anatomy and mentoring campers. I provide the Suture Clinic portion of the camp as well as a source of advising/mentorship for counselors and campers, and faculty support for the program.

##### *Colorado 4-H State Conference, Fort Collins, CO*

Virtual Bovine Anatomy Workshops 2018-19; cancelled 2020 due to COVID-19: – Presentation for high school 4-H members on CVMBS major(s) and career paths, as well as a wetlabs with anatomical specimens and VAA-VR demos

##### *DVM Tutoring Program, CVMBS, CSU*

Summer 2018 I worked with Dr. Andrew West, Director of the CVMBS Academy for Teaching and Learning, to revamp the DVM Tutoring program to include a summer Capstone review as well as a new Canvas based Group Tutoring program for each of the major DVM year 1 and 2 courses beginning Fall 2018. I now supervise 1 program coordinator, a DVM Program Teaching Assistant (DPTA) for each of the major courses, and the 2-3 Student Assistant Study Session (SASS) Coordinators who facilitate each of the weekly group study hall sessions. The Fall semester is initiated with Echo recorded “How to be successful in vet school” feedback sessions for 1st year DVM students, as well as training and support for the tutors to improve their teaching skills. 2019 marks the program’s second year, student surveys and course performance evaluation demonstrate a continued reduction in dependence on 1-1 tutoring for and satisfactory student outcomes.

*MSPro Café Workshop, Department of Biomedical Sciences, CSU*

September 2016-19: Led a 2 hour Suture Clinic for 20 MS students using the Canvas teaching module. Assisted by 2-3 other PA/MD/DVMs

*Biomedical Sciences Student Association and Pre-Vet Club – Suture Clinic Level 1, CSU*

November 2019: I convinced the two student organizations to work together to offer an introductory (Level 1) suture clinic. The 60 student suture lab was facilitated by me with the help of 15 club officers who had attended a previous suture clinic. The plan is to host a Level 2 suture clinic in the spring to focus on more advanced skills, including suture patterns. Student participants in Level 2 will be required to demonstrate correct instrument holding, a simple continuous suture pattern, and the ability to tie a square knot.

*Pre-Veterinary Club Day, College of Veterinary Medicine and Biomedical Sciences, CSU*

October 2012: Provided lectures and laboratory activities for the Reproduction and Anatomy Laboratories

October 2013: Provided lectures and laboratory activities for the Anatomy Laboratory session

October 2014: Provided an equine lameness and TPR clinical laboratory with virtual tool integration, also facilitated Small Ruminant Breeding Soundness Exam laboratory

October 2015: Provided lecture and laboratory activities for the Artificial Insemination session

January 2017: Invited talk “So you want to be a veterinarian?” at PreVet Club Monthly meeting

October 2017: Key Note Address to Pre-Vet Club Annual Symposia

October 2019: Small Animal Reproduction: Spay and Neuter Laboratory session

*Predator vs. Prey – How can you tell? Sheila Henke, 3rd grade class, Bennett Elementary School, Fort Collins, CO*

In-class outreach program with 22 students using canine, equine, feline, and bovine skulls and a plastinated sagittal fetal calf head, as well as demonstration of the VAA-VR program.

*Biomedical Sciences Student Association, College of Veterinary Medicine and Biomedical Sciences, CSU*

February 2016: Invited talk “So you want to go to professional school?” at BSA monthly meeting

April 2016: Suture Clinic for 50 BSA members with the help of 5 other faculty and MD/DVMs

STEM Anatomy Lecture for CSU Senior Scholarship Day – recruitment Fall 2015