

# Curriculum Vitae

**NAME:** Christianne Magee

**ADDRESS:** 1680 Campus Delivery  
Department of Biomedical Sciences  
College of Veterinary Medicine and Biomedical Sciences  
Colorado State University  
Fort Collins CO 80526

**Office Phone:** 970-491-7371

**Email:** Christianne.Magee@colostate.edu

**Website:** <https://christiannemagee.com/>

## **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

## **CV SECTION 1: Employment History and Awards**

### **ACADEMIC POSITIONS**

July 1, 2021 Associate Professor (with tenure) Department of Biomedical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO.  
2018 - 2021 Assistant Professor, Regular Appointment (TT), Department of Biomedical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO.  
2012 - 2018 Assistant Professor, Special Appointment (NTT), Department of Biomedical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO.

### **JOB DESCRIPTION**

	%Teaching/ Mentoring	% Research / Creative Activity	% Service / Outreach	% Administrative
2018-present	65	20	15	0
2012-2017	65	15	20	0

### **HONORS AND AWARDS (since 2008)**

2011-2015 *Clinical Award* (\$96,000) from National Institutes of Health (NIH) Contraception and Infertility Loan Repayment Program (LRP), funded by National Institute of Child Health and Human Development (NICHD)  
2013 *Teaching Fellow*, The Institute for Teaching and Learning (TILT) at Colorado State University. TILT/Reinvention Center Science of Learning Course Development Competition is an ambitious effort to enhance learning, increase engagement, and promote pedagogical innovation undergraduate course redesign. Department heads must support faculty applications and selection is made by TILT. This opportunity was used to re-design BMS305 and create a programmatic vision for animal anatomy instruction in BMS.  
2008-2010 *Trainee*, NIH Training Grant in Mammalian Reproductive Biology (T32-HD007031). Animal Reproduction and Biotechnology Laboratory, Department of Biomedical Sciences, Colorado State University, Fort Collins, CO  
2009 *Young Investigator Award*, American Quarter Horse Foundation. Competitive award to support the applicant and their research  
2009 *Thornburg Research Award, 1<sup>st</sup> Place Student Talk*. Colorado State University Department of Biomedical Sciences Annual Research Retreat. Fort Collins, CO  
2009 *Carlton Sundberg Memorial Scholarship*. Colorado State University, College of Veterinary Medicine and Biomedical Sciences. Fort Collins, CO  
2008 *Storm Cat Career Advancement Award*, Grayson Jockey Club Foundation. One time (\$20,000) personal award intended to support development of promising equine investigators

## CV SECTION 2: Publications/Scholarly Record

### PUBLISHED WORKS

#### Refereed Journal Articles (\*corresponding author):

1. Lee S, Wendland TM, Rao S, \***Magee C**. 2021. Orthotic Device Use in Canine Patients: Owner Perception of Quality of Life for Owners and Patients. *Frontiers in Veterinary Science*. 2021; 8:1264. DOI: 10.3389/fvets.2021.709364. PMID: 34805329
2. Linton A, Garrett AC, Ivie KR, Jones JD, Martin JF, Delcambre JD, \***Magee C**. 2021. Enhancing anatomical instruction: Impact of a virtual canine anatomy program on learning outcomes. *Anatomical Sciences Education*. doi: 10.1002/ase.2087. PMID: 33838080.
3. Hollinshead FK, Ontiveros M, Burns JG, **Magee C**, Hanlon DW. Factors influencing parentage ratio in canine dual-sired litters. *Theriogenology*. 2020;158:24-30. PMID: 32927197.
4. \***Magee C**, Bruemmer JE, Kirkley KS, Sylvester LA, Runyan B, Nett TM, Squires EL, Clay CM. Kisspeptin has an independent and direct effect on the pituitary gland in the mare. *Theriogenology*. 2020;157:199-209. PMID: 32814247.
5. \***Magee C**, McDaniel S, Turk P, Striegel N, Roman-Muniz IN. Information-Seeking Preferences of the Colorado Equine Industry for Distribution of Disease Outbreak Information. *J Equine Vet Sci*. 2020;91:103126. PMID: 32684264.
6. Murtazina DA, Arreguin-Arevalo JA, Cantlon JD, Boroojany AE, Shrestha A, Hicks JA, **Magee C**, Kirkley KS, Jones KL, Nett TM, Chitsaz H, Clay CM. 2020. Enrichment of ovine gonadotropes via adenovirus gene targeting enhances assessment of transcriptional changes in response to estradiol. *Biology of Reproduction*, 102:156-169. PMID: 31504222. 2 citations as of 9-17-2020.
7. Urias-Castro CA, Arreguin-Arevalo JA, **Magee C**, Weber E, Nett TM. 2019. Hypothalamic Concentrations of Kisspeptin (KP) and Gonadotropin-Releasing Hormone (GnRH) during the Breeding Season and Non-Breeding season in Ewes. *American Journal of Reproductive Immunology*. 82:e13146. PMID: 31206871. 0 citations as of 9-17-2020.
8. 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. 2 citations as of 9-17-2020.
9. Dang AK, Murtazina DA, **Magee C**, Navratil AM, Clay CM, Amberg GC. 2014. GnRH evokes localized subplasmalemmal calcium signaling in gonadotropes. *Mol Endocrinol*. 28:2049-59. PMID: 25333516. 16 citations as of 9-17-2020.
10. **Magee C**, Bruemmer JE, Nett TM, Squires EL, Clay CM. 2012. Kisspeptide in the estrous mare: Is it an appropriate ovulation-inducing agent? *Theriogenology*. 78:1987-96. PMID: 23040060. 7 citations as of 9-17-2020.
11. Seachrist DD, Johnson E, **Magee C**, Clay CM, Graham JK, Veeramachaneni DN, Keri RA. 2012. Overexpression of follistatin in the mouse epididymis disrupts fluid resorption and sperm transit in testicular excurrent ducts. *Biol Reprod* 87:41. PMID: 22649074. 10 citations as of 9-17-2020.
12. **Magee C**, Foradori CD, Bruemmer JE, Arreguin-Arevalo JA, McCue PM, Handa RJ, Squires EL, Clay CM. 2009. Biological and anatomical evidence for kisspeptin regulation of the hypothalamic-pituitary-gonadal axis of estrous horse mares. *Endocrinology*. 150:2813-21. PMID 19228887. 58 citations as of 9-17-2020.
13. McCue PM, **Magee C**, Gee EK. 2007. Comparison of Compounded Deslorelin and hCG for Induction of Ovulation in Mares. *J Equine Vet Science*. 27, 58-61. 33 citations as of 9-17-2020.
14. McCue PM, Logan NL, **Magee C**. 2007. Management of the transition period: hormone therapy. Tutorial article. *Equine Vet Educ*. 19, 215-221. 24 citations as of 9-17-2020.
15. McCue PM, Logan NL, **Magee C**. 2007. Management of the transition period: physiology and artificial photoperiod. Tutorial article. *Equine Vet Educ*. 19, 146-150. 16 citations as of 9-17-2020.

#### Textbooks:

1. Fails AD and **Magee C**. 2018. Anatomy and Physiology of Farm Animals. 8<sup>th</sup> Edition. Wiley. (Reviewed in JAVMA 2019)

#### Refereed Proceedings/Transactions (since 2019):

1. Martin JF, Arnold O, Linton A, Garret A, **Magee C**. How Virtual Animal Anatomy Facilitated a Successful Transition to Online Instruction and Supported Student Learning During the Coronavirus Pandemic. 2022 CVMBBS Research Day. Student Poster.
2. Martin JF, Linton A, **Magee C**. Evaluating Learning Resources Developed as a Result of the 2020 COVID-19 100% Online Transition in the 2021 Hybrid Learning Environment. Western Consortium Regional Teaching Academy Biennial Meeting. Scholarship Platform Session. Online, July 2021.
3. Salman S, Asghar A, **Magee C**, Winger Q, Bouma G, Bruemmer J. 2019. Establishment and characterization of Day 30 equine chorionic girdle and allantochorion cell lines. *Reproduction, Fertility and Development* 32, 171-171. Proceedings of the 2020 Annual Conference of the International Embryo Technology Society, New York, NY.

4. **Magee C**, Kirkley K, Sylvester L, Runyan B, Clay C. 2019 Immunohistochemical evidence for kisspeptin signaling in equine gonadotropes. Society for Theriogenology Annual Conference. Poster Presentation. Savannah, GA.
5. AC Garrett, Ivie KR, Linton A, Martin JF, Delcambre JJ, Whalen LW, **Magee C**. Use of Virtual Canine Anatomy Improves Student Outcomes in an Undergraduate Domestic Gross Anatomy Course. 2019. American Association Veterinary Anatomists Annual Meeting. Poster Presentation. University of Calgary, Canada.
6. AC Garrett, Ivie KR, Linton A, Martin JF, Delcambre JJ, Whalen LW, **Magee C**. Use of Virtual Canine Anatomy Improves Student Outcomes in a Domestic Gross Anatomy Course. 2019. Western Consortium Regional Teaching Academy Biennial Meeting. Scholarship Platform Session. UC Davis, California.

### **Refereed Journal Articles In Review**

1. Martin JF, Arnold OR, Linton A, Jones JD, Garrett AC, Mango DW, Juarez KA, Gloeckner G, **Magee C**. "How Virtual Animal Anatomy Facilitated a Successful Transition to Online Instruction and Supported Student Learning During the Coronavirus Pandemic" *Anatomia, Histologia, Embryologia* (AHE-05-21-SI-142) has been reviewed and resubmitted.

### **CONTRACTS & GRANTS** <sup>α</sup>disciplinary, <sup>δ</sup>interdisciplinary, <sup>φ</sup>service, <sup>ε</sup>engagement

#### **Externally-Funded Projects as PI (since 2018)**

- <sup>β</sup>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 undergraduate (UG) Applied Food Animal Anatomy curricula; 3) engagement of UG and DVM students in learning, teaching, and outreach activities. Progress Report submitted in 2021 outlining launch of BMS380 (Aim 2) and work towards Aims 1 and 3 within the scope of the COVID pandemic
- <sup>α</sup>2017-2020 "Evaluation of Kisspeptin in the Pregnant Mare" \$113,000. *Grayson Jockey Club Foundation*, Lexington, KY. Aims: 1) Quantification of kisspeptin during equine pregnancy; 2) characterization of Kiss1/Kiss1r expression at the fetal-maternal interface. This work was interrupted by the pandemic and continues with support from startup funds.

#### **Externally-Funded Projects as Co-PI**

- <sup>α</sup> 2021-2022 "Exploring the Development of Relationships between Students and Faculty in Veterinary Medicine: A Mixed Methods Study Comparing Remote and In Person Techniques." \$3,000.00. PI: Marino T Western Consortium Regional Teaching Academy - Novel and Innovative Educational Research.
- <sup>α</sup> 2021-2022 "Validation of chorionic girdle organoid cell culture as an in vitro source of equine chorionic gonadotropin" \$20,000.00, PI: Hollinshead FK The Foundation for The Horse. Primary Aim is to validate organoids for eCG production. Abstract submitted to the International Congress on Animal Reproduction meeting in 2022.
- <sup>α</sup> 2021-2022 "Validation of chorionic girdle organoid cell culture as an in vitro source of equine chorionic gonadotropin" \$20,000.00, PI: Hollinshead FK The Foundation for The Horse. Primary Aim is to validate organoids for eCG production. Abstract submitted to the International Congress on Animal Reproduction meeting in 2022.
- <sup>α</sup> 2021-2026 "Reproductive Biotechnology for Sustainable Animal Production: A Multidisciplinary Graduate Fellowship Program" PI: Tesfaye D. USDA-National Needs Fellowship. (Support of PhD student, Jason Martin, 2021.)
- <sup>α</sup>2020-2021 "Kisspeptins as Pro-apoptotic Mediators during Equine Endometrial Cup Demise" \$5,000. PI: Gomes VCL, Co-PI: Sones JL. Theriogenology Foundation. Primary Aim is to compare the spatiotemporal Kiss1/Kiss1r gene and protein expression during pregnancy. This has supported Gomes PhD work and I serve on her committee.

#### **Externally-Funded Projects as Collaborator**

- <sup>α</sup>2020-2021 "Equine fetally-derived mesenchymal stem cells (FDMSC) and their generated extracellular vesicles (EV) as a novel treatment for equine osteoarthritis." \$20,000. Co-PIs: FK Hollinshead & L Goodrich, AAEP Foundation for the Horse. Primary Aim is to demonstrate that EVs from FDMCS are a superior treatment for equine osteoarthritis. Preliminary data from this will support Hollinshead as PI for Boettcher and TMI TAP grants in 2022 and a manuscript is in progress.

#### **Internally-Funded Projects as PI (since 2012)**

- <sup>α</sup>2020-2021 "Metabolic and Reproductive Consequences of Elevated Free Fatty Acids in Domestic Ruminants" \$25,000 CVMBS College Research Council, Colorado State University. Aim 1: By using normal weight, normally cycling ewes during diestrus, we test the specific hypothesis that increased circulating FFAs and hyperinsulinemia result in reduced pituitary sensitivity to GnRH in the normal ewe. Aim 2: Decreased pituitary sensitivity to GnRH is understood to be responsible in humans for the gonadotropin phenotype observed in reprometabolic syndrome. In this aim we propose to validate an in vitro model for reprometabolic syndrome using primary sheep pituitary cells by testing the specific hypothesis that E2 induced increase in specific gonadotrope gene expression will be eliminated (or reduced) by the presence of increased fatty acids in the culture media. In addition to a manuscript in preparation, this is serving a preliminary data for an R21, Clay-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. Project not initiated and funding returned in 2021 due to COVID pandemic.
- ♠2013-2014 “Development of a Virtual Bovine Anatomy (VBA) Tool” Role: PI, \$23,500 CVMBS College Research Council, Colorado State University, Fort Collins, CO. The specific project deliverable was the bovine osteology module for VBA which served as preliminary data for USDA NIFA HEC grant applications.
- ♣2011-2012 “Measurement of Kisspeptin in the Horse” Role: PI, \$16,500 CVMBS College Research Council, Colorado State University, Fort Collins, CO. The specific project deliverable was an equine radioimmunoassay for kisspeptin that I developed and was necessary to secure a Grayson Jockey Club Research Foundation grant (2017-2020). The RIA methods and materials contributed to the Urias-Castro et al., 2019 manuscript.

**Pending Applications**

- ♣2022-2023 “Evaluating extracellular vesicles from equine fetally-derived mesenchymal stem cells as an endometritis therapeutic” Role: Co-PI, PI: Hollinshead. Grayson-Jockey Club Research Foundation, \$45,418. The objective of this proposal is to assess equine fetally-derived mesenchymal stem cells for their anti-inflammatory cargo and their effects on reducing inflammation in an in vitro equine endometritis model. Anticipated notification: 03/2022

**Applications Submitted but not Funded (shown by year submitted, since 2019)**

- ♣2021 “In vitro production of Equine Chorionic Gonadotropin” Role: Co-PI, PI: Hollinshead. Grayson-Jockey Club Research Foundation, \$15,001.98. Primary aim to produce eCG from organoids.
- ♣2020 “Convergent Mechanisms Underlying Reprometabolic Syndrome in Women and Sheep” Role: Co-PI, PIs: Clay C & Santoro N. Colorado Clinical and Translational Sciences Institute Co-Pilot grant. \$45,600.00. Primary Aim to demonstrate the fidelity of the obese sheep model for human reprometabolic syndrome.
- ♣2020 “Validation of Equine Endometrial Organoids as a Three-Dimensional In Vitro Culture Model for the Study of Equine Endometritis” Role: Co-PI, PI: Hollinshead, FK. Morris Animal Foundation. \$10,800.00. Primary Aim to demonstrate the fidelity of the organoid as a model system for equine endometritis.
- ♣2020 “Investigation of In Vitro Production of Equine Chorionic Gonadotropin Using an Organoid Culture System” Role: Co-PI, PI: Hollinshead, FK. American Quarter Horse Association, \$19,650. Young Investigator Award for Riley Thompson.
- ♣2020 “Organoids as Novel 3D Model for Endometritis” Role: Co-PI, PI: Hollinshead, FK. Grayson-Jockey Club Research Foundation. 42,302.80. Primary Aim to demonstrate the fidelity of the organoid as a model system for equine endometritis.
- ♣2020. "Development of Virtual Reality to Train, Teach, and Simulate Veterinary Practice (phase anesthesia)" PI: Boscan P Aims: 1) Develop an interactive virtual reality application to simulate the practice of veterinary medicine (VetVR). Specifically, veterinary anesthesia for this phase. 2) Demonstrate that interactive systems using virtual reality enhances cognitive outcomes (knowledge and self-efficacy) as well as clinical skill outcomes (task process and professional skills) to improve professional performance, medical and anesthesia care. Submitted to the following: 1) American Kennel Club – Canine Health Foundation (\$49,795); 2) Colorado State University Office of the Vice President for Research Q1FY20 Award (\$20,000); 3) CSUVentures Launchpad Fuel Program
- ♠ 2019 USDA-NIFA Higher Education Challenge “Virtual Bovine Anatomy: Pelvic Limb” \$150,000 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
- ♣2019 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. Aims: to integrate the broad outreach activities in the CVMBS by scientifically evaluating current programmatic efforts, expanding impact, advancing collaboration, strengthening infrastructure, and broadening participation. Program plan used to secure funding for Zoetis Pre-Veterinary Discovery Camp

## **PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES\*/PROFESSIONAL MEETINGS/WORKSHOPS (since 2017)**

- October 2021. "How High School Students with Limited Access to Mentoring in Veterinary Medicine Received College Credit and Experiential Learning: Veterinary Perspectives Virtual Institute" CSU Diversity Symposium. Fort Collins, CO. <https://www.youtube.com/watch?v=ppkCZJdpoWc> – also accepted as a 2022 CSU TILT PDI Jan 12, 2022.
- \*March 2021. "Evidence-based strategies for scaffolding anatomy learning." Louisiana State University School of Veterinary Medicine Seminar Series, Virtual Presentation.
- \*August 2020. "Using Virtual Animal Anatomy to bridge the COVID-19 gap in cadaveric access and laboratory learning." [World Association Veterinary Anatomists 1<sup>st</sup> Online Meeting](#). Meeting abstract received highest score, resulting in the only abstract invited for platform presentation. Co-authors were the Spring 2020 VVET and Animal Anatomy teaching team: A Linton, A Garrett, K Juarez, and D Mango. Abstracts to be published in *Anatomia, Histologia, Embryologia*.
- \*January 2020. "Development of 3D VR assets and Evaluation of VR in DVM teaching." Invited talk and VR demonstration at the UC Davis School of Veterinary Medicine. Davis, CA.
- \*July 2019. "Virtual Animal Anatomy in DVM Education." E-Health Summer University. Invited talk and VR demonstration. Castres, France
- \*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
- April 2019. "Virtual Animal Anatomy – VR Education." Veterinary Innovation Summit. Selected start-up for VR demonstrations. College Station, TX
2018. "Virtual Animal Anatomy: From Research to Market." Presenter at Department of Biomedical Sciences Annual Retreat. Colorado State University, Estes Park, CO
- \*2018. "Virtual Animal Anatomy - Japanese Translation." Invited talk at University of Hokkaido Veterinary School. Sapporo, Japan
- \*2017. "Scaffolding Learning in Anatomy: The Pelvic Limb." Invited Talk at Tufts University Cummings School of Veterinary Medicine, Grafton, MA
- \*2017. "Virtual Animal Anatomy: User Experiences and Future Directions." Invited Talks at Daktari Animal Hospital, Tokyo and University of Hokkaido Veterinary School. Sapporo, Japan
2017. "Virtual Animal Anatomy: User Experiences and Future Directions." Special Seminar, Department of Biomedical Sciences, Fort Collins, CO

## **COLLABORATIVE, INTERCOLLEGIATE & INTERDISCIPLINARY SCHOLARSHIP**

**For an evaluation of these activities by Dr. David Paterson (Assistant VP for Research at CSU), please visit my website at <https://christiannemagee.com/virtual-animal-anatomy>**

### **Virtual Veterinary Education Tools (VVET) – 2012-present, Program Lead as of 2018**

- - **Virtual Animal Anatomy (VAA)** is a suite of virtual 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. I joined the team in 2012 under the leadership of Ray Whalen and following his retirement in 2018 became the Program Lead. My direct contributions to VVET include securing extramural funding (USDA, \$150,000), learner outcomes analyses of educational interventions, dissection, image acquisition, and annotation of the *Virtual Equine Anatomy*, *Virtual Feline Anatomy*, and *Virtual Bovine Anatomy*, as well as development and distribution for additional income (>\$200,000) from these programs. The VR program also continues to support other teaching, outreach and engagement efforts, but is not yet commercially distributed. This work is completed with the assistance of 2 full-time developer/programmers (Linton/Garrett), 2-6 student employees working full-time during summer months and 10-20 hours work/week during the school year, and anatomy faculty in BMS. Prior to 2021, funding for VVET came from the DVM program (VTA \$25,000/year) and total faculty/staff BMS subsidized input to VAA program development was 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. In 2021, all of the DVM support for VTAs and some of the salary support of Garret and Linton has been able to shift to program income and support from Spur. My goal as Program Lead continues to be that VVET will be financially independent of CVMBMS and the DVM program by 2023.

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

- Completion of the **CSU Ventures Research to Market** in 2018 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 that generated more than \$25,000 in individual program sales 2018-2020.

- **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 July 2020, VAA-LTI has generated more than \$150,000 of direct income to BMS/CVMBS.** These funds contribute to additional program development and sustaining efforts in BMS and DVM anatomy. In 2021, an ADA compliance update of the software interaction was completed using consulting services from Perkins Access fro Perkins School for the Blind, paid for by VAA-LTI income.
  - **VAA-Single User** - soft-launch September 2020. <https://www.csuvtce.com/virtual-animal-anatomy/> At a cost of either \$40/year or \$5/mo, this unadvertised launch has generated ~\$8,000 of income in 2021 and we continue to work with TMI to resolve their distribution challenges for further accessibility with the intention of free distribution to CVMA members and CSU DVM alumni.
- **Collaborations & Engagement Approved by CSU Office of General Counsel**
  - 2017, Faculty at the **University of Hokkaido in Japan**. The translation to Japanese was completed December 2021 and is being tested by collaborating in Japan with final contracts for distribution in progress.
  - 2019, William Pérez, PhD, Professor of Anatomy at **Universidad de la República de Uruguay** and former President of the World Association of Veterinary Anatomists. Translation of the VCA to Spanish (launched August 2020) with ongoing VEA Spanish translation.
  - 2020, **UCDavis School of Veterinary Medicine**, Development of 3D VR assets and evaluation of VR in DVM teaching, invited talk at UCDavis January 2020
  - 2020, Marco A. Pereira-Sampaio DVM, MS, PhD, Professor, Department of Morphology, **Fluminense Federal University (Brazil)**, President of the World Association of Veterinary Anatomists. Collaboration as of August 2020 for Portuguese translation of VAA.
  - 2021, **ENGAGE** – A VR platform introduced to us by the Anatomy team at Stanford Medical School. We have an MTA for transfer of our VR objects into their platform to validate ENGAGE as a learning platform for SPUR and CVMBS Outreach engagement
  - 2021, **Scarlet Imaging (SI)** and Scott Echols, DVM. Dr. Echols is the inventor of BriteVu, a contrast media for post-mortem imaging, when coupled with a non-formaldehyde-based preservation medium. In conjunction with Dr. Tanya Applegate, we have a research agreement with an NDA for SI patented and patent pending products. This project has been supported by income from VAA-LTI as an opportunity to develop new learning tools and methods for teaching gross anatomy and surgical training.
- **Additional Demonstrations of VAA-VR program**
  - **InterNICHE** - Leicester, England. Nick Jukes, Coordinator – Documentary Interviews (2 days, 2019) Goal of Documentary: Highlight educational practices that reduce or replace cadaver instruction.
  - **University of Hokkaido**, Anatomy Faculty visit, Fort Collins, CO (2019)
  - **CSU VTH Open House**, Fort Collins, CO (1 day, 2019)
  - **CSU DVM Alumni Weekend**, Fort Collins, CO (1 day, 2019)
  - **Veterinary Information Network**, Founder Dr. Paul Pion, Fort Collins, CO (1 day, 2019)
  - **Theriogenology Student Conference**, Savannah, GA (1 day, 2019)
  - **CSU BMS MSB Alumni Weekend**, Fort Collins, CO (1 day, 2019)
  - **Colorado Veterinary Medical Association Annual Meeting**, Keystone, CO (3 days, 2019)
  - **Veterinary Innovation Summit**, Translational Medical Institute, Fort Collins, CO (3 days, 2019)
  - **Georgia Veterinary Medical Association**, Fort Collins, CO (2 hours, 2019)
  - **UCDavis DVM Program**, Fort Collins, CO (5 hours, 2019)
  - **Louisiana State University School of Veterinary Medicine**, Baton Rouge, LA (1 day, 2019)
  - **CSU Vice President for Research Demo Day**, Fort Collins, CO (1 day, 2018-19)
  - **Zoobiquity Conference**, Fort Collins, CO (1 day, 2019)
  - **CSU CVMBS Outreach program** – Larimer County, Weld County, and Colorado State Fair, Summer 2021

## **CONTRACTS**

**Virtual Animal Anatomy (HTML5-LTI) Software as a Subscription** As Program Lead for Virtual Veterinary Education Tools, I develop all strategies for creation and distribution of anatomical content and work with CSU entities (OGC, CSUVentures, ACNS) and contractors to ensure that we are compliant with CSU policies as well as accessibility (ADA), privacy (FERPA) and security regulations. I foster collaborations, monitor all external communications, determine product pricing, provide 24/7 customer service, conduct customer discovery, provide user training, and supervise 2 full-time staff and 2-6 part-time student employees. From March 17-July 1, 2020 the VAA-LTI program was provided for free in response to COVID-19. More than 140 schools (K-12, undergraduate, and professional veterinary and technician programs) with 12,000 users from around the world were granted access to the LTI. Since July 2020, there are more than 75 new, with more than 50% renewals in 2021, of VAA-LTI educational subscribers and many more are directing their students to use the individual subscription mechanism.

### **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>

### **Continuing Education and Professional Development since 2018 (Approx. No. of Hours Spent Per Year: ANH/Y)**

- 2021 CSU Alliance Diversity and Mentorship training (2h)  
CSU Diversity Symposium (8h)  
Western Consortium Regional Teaching Academy annual meeting (6h)  
Society for Theriogenology Meeting, online (16h)  
USDA APHIS Category II Renewal (6 modules)  
DEA license (RM0586670) Renewal
- 2020 Colorado Veterinary Medical Association, mandatory Controlled Substance training (2.5h)  
Society for Theriogenology Meeting, online
- 2019 CSU CVMBS Inclusive Pedagogy Training. ANH/Y: 10
- 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
- CSU CVMBS Teaching Academy Seminars. ANH/Y: 2
- Strategies for Making the Most Important Ideas in a Lecture Clear to Students
  - Conversations About Medical Education: Team Based Learning
- CSUVentures State of Innovation: Education Series - Considerations for Protecting Intellectual Property for Software, AI, & AR/VR Applications by Bob O'Loughlin. ANH/Y: 2
- Colorado State University's 80<sup>th</sup> Annual Conference for Veterinarians. Fort Collins, CO. ANH/Y: 16
- Regional Teaching Academy VETS 2.0 Curriculum Development Workshop, UC Davis, CA. ANH/Y: 20
- Society for Theriogenology Meeting, Savannah, GA. ANH/Y: 32 CE Hours
- 2018 – 2019 Mentoring Program, "ENCIRCLE," CSU - Standing Committee on the Status of Women Faculty & Office of the Vice Provost for Faculty Affairs. ANH/Y: 3
- 2018 Conference Attendance, "Record Freshmen Enrollment: What to Expect in the Future and What We Can Learn from the Past," TILT PDI CSU. Fort Collins, CO ANH/Y: 2
- Short Course, "Research to Market (R2M) - Virtual Animal Anatomy," CSU Ventures, Launchpad, September - December 2018. Fort Collins, CO. ANH/Y: 100
- CSU Supervisor Training, "Inclusive Excellence Part 1" ANH/Y: 2.5
- CSU Supervisor Training, "Effective Teams" ANH/Y: 2.5
- CSU Supervisor Training, "Mindset for Supervisors" ANH/Y: 3
- CSU Supervisor Training, "Inclusive Excellence Part 2" ANH/Y: 2.5
- CSU Supervisor Training, "Emerging Women Leaders Webinar" ANH/Y: 1.5
- CSU Supervisor Training, "Effective Communication and Conflict Resolution Skills" ANH/Y: 2
- CSU Supervisor Training, "Systems Thinking: Your Role in the Bigger Picture" ANH/Y: 3
- CSU Supervisor Training, "Rules of the Road" ANH/Y: 4
- Colorado State University's 79<sup>th</sup> Annual Conference for Veterinarians. ANH/Y: 16 CE
- 2014 – 2018 CSU CVMBS Leadership Development Group Training with Cindy Anderson Consulting, LLC. Monthly leadership seminars and workshops. Fort Collins, CO. ANH/Y: 50

**CV SECTION 3: EVIDENCE OF TEACHING AND ADVISING EFFECTIVENESS**

**TEACHING:**

***For an evaluation of these activities in 2020 by Dr. J Walrond (Chair, BMS Undergraduate Curriculum Committee).***

***please visit my website at <https://christiannemagee.com/teaching-%26-advising>***

**Table 1. Teaching Summary (since 2018): Credit Hours/Student (credits taken by each student) Total Student Credit Hours (Credit Hours/student x students); Student Hours (% effort x total student credit hours); Course Hours (% effort x course credit hours/student); \*Course Director; #Course Support; <sup>φ</sup>lab credits included in total course credit hours, <sup>λ</sup>effort for laboratory credits not included in summary.**

Year	Sem	Class	My % Effort/ Course	Credit Hours/ student	Enrolled Students	Total Student Credit Hours	Student Hours	Course Hours
2018	Fa	VM616 <sup>#λ</sup> - Functional Anatomy - Recitation 9 cr (5-8-1)	1%	0	137	0	0.0	0
2018	Fa	VM618* - Veterinary Physiology and Histology	50%	7	137	959	479.5	3.5
2018	Fa	VM722 <sup>#</sup> - Veterinary Pharmacology	1%	4	139	556	5.6	0.04
2018	Sp	BMS260 <sup>#</sup> - Biomedical Sciences - Honors Recitation	1%	1	20	20	0.2	0.01
2018	Sp	BMS260 <sup>#</sup> - Biomedical Sciences - Recitation	1%	1	52	52	0.5	0.01
2018	Sp	BMS305* - Domestic Animal Gross Anatomy	60%	4	112	448	268.8	2.4
2018	Sp	BMS305* - Domestic Animal Gross Anatomy - Honors	60%	4	9	36	21.6	2.4
2018	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	75	0	0.0	0
2018	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	46	0	0.0	0
2018	Sp	BMS384* - Supervised College Teaching	60%	1 to 3	33	48	28.8	0.6
2018	Sp	BMS495* - Independent Study	60%	1 to 4	3	6	3.6	0.6
2018	Sp	BMS496D* - Honors: Animal Gross Anatomy	95%	1	9	81	77.0	0.95
2018	Sp	BMS531* - Domestic Animal Dissection	60%	3	42	126	75.6	1.8
2018	Sp	BMS633* - Domestic Animal Anatomy-Case Discussions	90%	2	16	32	28.8	1.8
2018	Sp	BMS684* - Supervised College Teaching	60%	1 to 5	9	19	11.4	0.6
2018	Sp	VM795* - Independent Study-LA Anatomy	70%	1	24	24	16.8	0.7
2019	Fa	VM616 <sup>#λ</sup> - Functional Anatomy - Recitation 9 cr (5-8-1)	1%	0	138	0	0.0	0
2019	Fa	VM618* - Veterinary Physiology and Histology	40%	7	138	966	386.4	2.8
2019	Fa	VM722 <sup>#</sup> - Veterinary Pharmacology	1%	4	136	544	5.4	0.04
2019	Sp	BMS695F* - Independent Study-Gross Anatomy	60%	1	5	5	3.0	0.6
2019	Sp	BMS305* - Domestic Animal Gross Anatomy	60%	4	114	456	273.6	2.4
2019	Sp	BMS305* - Domestic Animal Gross Anatomy - Honors	60%	4	11	44	26.4	2.4
2019	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	79	0	0.0	0
2019	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	46	0	0.0	0
2019	Sp	BMS384* - Supervised College Teaching	60%	1 to 2	14	21	12.6	0.6
2019	Sp	BMS495* - Independent Study	60%	1 to 2	7	10	6.0	0.6
2019	Sp	BMS496D* - Honors: Animal Gross Anatomy	95%	1	10	90	85.5	0.95
2019	Sp	BMS531* - Domestic Animal Dissection	60%	3	22	66	39.6	1.8
2019	Sp	BMS633* - Domestic Animal Anatomy-Case Discussions	90%	2	17	34	30.6	1.8
2019	Sp	BMS684* - Supervised College Teaching	60%	1	6	6	3.6	0.6
2019	Sp	VM795* - Independent Study-LA Anatomy	70%	1	19	19	13.3	0.7
2019	Su	BMS495* - Independent Study	60%	1 to 2	1	1	0.6	0.6
2020	Sp	BMS305* - Domestic Animal Gross Anatomy	60%	4	122	488	292.8	2.4



TABLE 1 TEACHING SUMMARY - CONTINUED (PAGE 2 OF 2)

2020	Sp	BMS305* - Domestic Animal Gross Anatomy - Honors	60%	4	8	32	19.2	2.4
2020	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	76	0	0.0	0
2020	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	54	0	0.0	0
2020	Sp	BMS384* - Supervised College Teaching	60%	1 to 3	21	32	19.2	0.6
2020	Sp	BMS495* - Independent Study	60%	1 to 3	4	6	3.6	0.6
2020	Sp	BMS496D* - Honors: Animal Gross Anatomy	95%	1	8	8	7.6	0.95
2020	Sp	BMS531* - Domestic Animal Dissection	60%	3	31	93	55.8	1.8
2020	Sp	BMS633* - Domestic Animal Anatomy-Case Discussions	90%	2	15	30	27.0	1.8
2020	Sp	BMS684* - Supervised College Teaching	60%	1 to 2	6	9	5.4	0.6
2020	Sp	BMS695F* - Independent Study-Gross Anatomy	60%	1 to 2	2	3	1.8	0.6
2020	Sp	VM795* - Independent Study-LA Anatomy	80%	1	14	14	11.2	0.8
2020	Fa	VM616 <sup>#%</sup> - Functional Anatomy - 9 cr (5-8-1) (8h lab/week)	1%	8	143	1,144	11.4	0.08
2020	Fa	VM618* - Veterinary Physiology and Histology	50%	7	143	1,001	500.5	3.5
2020	Fa	VM722 <sup>#</sup> - Veterinary Pharmacology	1%	4	143	572	5.7	0.04
2021	Sp	BMS305* - Domestic Animal Gross Anatomy	60%	4	76	304	182.4	2.4
2021	Sp	BMS305* - Domestic Animal Gross Anatomy - Honors	60%	4	9	36	21.6	2.4
2021	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	39	0	0	0
2021	Sp	BMS305* <sup>φ</sup> - Domestic Animal Gross Anatomy - Lab 4 cr (3-3-0)	60%	0	37	0	0	0
2021	Sp	BMS384* - Supervised College Teaching	60%	1 to 3	19	38	22.8	1.2
2021	S-F	BMS495* - Independent Study (Spring, Summer, Fall)	60%	1 to 3	6	12	7.2	1.2
2021	Sp	BMS496D* - Honors: Animal Gross Anatomy	95%	1	8	8	7.6	0.95
2021	Sp	BMS531* - Domestic Animal Dissection	60%	3	38	114	68.4	1.8
2021	Sp	BMS633* - Domestic Animal Anatomy-Case Discussions	90%	2	21	42	37.8	1.8
2021	Sp	BMS684* - Supervised College Teaching	60%	1 to 2	8	12	7.2	0.9
2021	Sp	VM795* - Independent Study-LA Anatomy	80%	1	23	23	18.4	0.8
2021	Su	VMBS180A1* - Alliance Institute Veterinary Perspectives	67%	1	20	20	13.4	0.67
2021	Fa	VM616 <sup>#%</sup> - Functional Anatomy - 9 cr (5-8-1) (1-2h lab/week)	1%	8	142	1136	11.36	0.08
2021	Fa	VM618* - Veterinary Physiology and Histology	50%	7	142	994	497	3.5

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

*CRN64749 VM618 Professional Veterinary Medicine – Histology and Physiology, 7 cr, Fall 2016-21. Avg. 138 students*  
I have aligned the physiology content with histology and gross anatomy, as well as the University of Alaska Fairbanks course. 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, 2016-21), Acid Base Physiology (3 h, 2021), Pulmonary Physiology (11hr, 2017-18), and Cardiovascular Physiology (2015). 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 2020 were course renovation for 100% online instruction Fall 2020. 2021 was a return to in-person teaching with extensive student absences, accommodations, and a major effort for Capstone remediation of students at CSU and UAF.

*CRN26792 VM795-004 Large Animal Anatomy Independent Study, 1 cr, Spring 2016-21 (12-35 students)*

This curriculum focuses on dissection of fresh and embalmed equine, bovine, ovine, caprine, and porcine specimens as well as canine and feline specimens for comparative anatomy. This was developed as part of the CVMBS strategic plan to increase food/fiber animal competencies in the DVM program and outreach opportunities. The experience is enriched with other learning opportunities including advanced clinical applications such as nerve blocks, nasogastric tube placement, and surgical approaches and a case study that is intended to improve communication skills related to anatomy and disease. I share this course with Dr. Jeremy Delcambre and I spend on average 4 hrs/week with these students. Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic. 2021 was a return to in-person dissection and learning prior to April, and case studies shifted to after the delayed Spring break.

*CRN11434(18480) BMS305-001(201) Domestic Animal Gross Anatomy(Honors), 4 cr, Spring 2012-21, Avg. 120 students*

This course is a survey of domestic animal anatomy using prosected specimens. I provide an average of 19 (of 45) 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). I gave fewer hours of lecture SP19, but provided regular input and lecture attendance for the new instructor (Andrew Garrett). Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic. 2021 was a return of in-person labs prior to Spring Break and all pre-recorded lecture. Canine hemiskulls were also 3D printed using VAA images and provided to students for free for online learning of the Head/Neck unit for the remote section of the semester. Manuscript in preparation from assessment of this learning tool.

*CRN26011 BMS496D-235 Honors Breakout Session BMS305, 1 cr, Spring 2013-20, Avg. 10 students*

I developed 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. 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. Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic. Skeletal assembly returned in 2021, but all course interactions were online via Teams.

*CRN11447 BMS 531-L01 Domestic Animal Dissection, 3 cr, Spring 2012-20, 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. I currently spend 6 of 9 hrs of scheduled laboratory time each week for this course to guide dissections and learning. Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic. In 2021, all students used an Oculus Quest 2 VR headset with VAA-VR for the Head/Neck unit in the last 3 weeks of the semester for online learning and assessments. Manuscript in preparation from assessment of this learning tool.

*CRN18390 BMS 633-001 Domestic Animal Anatomy – Case Discussions, 2 cr, Spring 2012-21, enrollment increased in 2020-21 from avg of 16 to 20 students*

This is an advanced, case-based study of anatomy for development of critical thinking and problem-solving skills. 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. Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic, with return to in-person teaching in 2021 until mandatory remote learning after Spring Break.

*CRN11443 BMS 384-001 Supervised College Teaching, 1-3 cr, Spring 2012-21, 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. Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic. In 2021, hybrid TA meetings with Zoom and in-person Open Labs were provided.

*CRN11443 BMS 684-001 Supervised College Teaching, 1-3 cr, Spring 2012-21, 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. Major effort in 2020 to transition remainder of semester to online due to COVID-19 pandemic. In 2021, hybrid TA meetings with Zoom and in-person Open Labs were provided.

CRN50293(Su)/61772(Fa)/11445(Sp) BMS495 or 695F-001 Independent Study, 1-2 cr, 2012-21, Avg. 12 students/yr  
These students will complete a variety of assignments for credit including but not limited to clinical experience in conjunction with a skeletal assembly, and a reflective, anatomy-based, clinical case report. Students who have previously completed BMS531 may register for BMS695F to participate in BMS795. Curriculum in 2021 ran in parallel to VM795.

**BMS380A1 Applied Food and Fiber Animal Anatomy Course – 3 cr, 30 students in first class (Fa2021)**  
Launched Fall 2021 and an Aim of the USDA-HEC grant as part of a greater plan to support DVM food/fiber competency and development of VAA food/fiber animal learning tools, this course is a case-based survey of those anatomically related diseases in chickens, camelids, sheep, goats, cattle, and pigs. Each unit has 4 major “problems” from each of these major production species that the students use Team Based Learning strategies to solve. Students also toured Morning Fresh Dairy, the Animal Sciences JBS Global Food Innovation Center (an abattoir), and had a necropsy lab with a DVM Food Animal faculty.

**Courses as Lecturer or Course Support (since 2015):** *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 the curriculum.*

CRN64744VM 616 Professional Veterinary Medicine – Functional Anatomy, 9 cr, Avg. 138 students,  
Fall 2021, floor anatomist and course support as needed (3 hours)  
Fall 2020, floor anatomist (8h/week) section B (70 students) for the entire semester (128h)  
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 2014-2015, floor anatomist (64 hrs for Head and Thorax, Abdomen, Pelvis Units)

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)

### **Evidence of Teaching Effectiveness**

*A review of my teaching activities was provided in 2020 by Dr. John Walrond (Chair, BMS Undergraduate Curriculum Committee). An “Extended Summary” was provided to Dr. Walrond for this review. Each course in the Extended Summary has its own summary of course specific changes with supporting evidence as indicated below. Please visit my website (<https://christianmamagee.com/teaching-%26-advising>) or use the hyperlinks provided for access to these materials.*

### **Peer Evaluations of Teaching**

1. 2015 - Drs. Andrew West ([Director CVMBS Academy for Learning and Teaching](#)) and Sherry Stewart ([Professor, Clinical Sciences](#))
2. 2017 - Dr. Andrew West ([Director CVMBS Academy for Learning and Teaching](#))

### **Student Course Surveys**

-[CSU DVM Class of 2023 Gratitude Statements](#)

-For a comprehensive summary, please Educator’s CV Section III [Quantitative Course Survey Data and Qualitative Course Survey Data](#) beginning on page 3.

### **Examples of Course Improvements**

-Please see: Courses 1 (BMS305), 3 (BMS531), 4 (BMS633), 5 and 6 (BMS384/684) in the [Extended Summary](#)  
-Please see BMS305/531 Laboratory Manual in the [Extended Summary](#)

### **Development of New Courses**

-VMBS1801 - Alliance Institute Veterinary Perspectives, Su21 – Supported by Zoetis, this Alliance Summer Institute program for 20 high school students to explore topics in One Health and related veterinary medicine careers. See Outreach

-BMS380A1 – Applied Food and Fiber Animal Anatomy, Fa21 – This course was offered only to MSB students (enrollment 30) Fall 2021, but will be expanded as a service course for Animal Sciences and other students.

-2020 - Please see: Courses 2 (BMS496D) and 7 (VM795) in the [Extended Summary](#)

## ADVISING:

### SUMMARY:

Current Graduate Committee Memberships (excluding those chaired):

	# Plan C
19	# Plan B
	# Plan A
	# MS/MA (no plan)
1	# PhD
4	# DVM

Graduate Committee Memberships (for past 5 years, not including those above)

	# Plan C
65	# Plan B
	# Plan A
2	# MS/MA (no plan)
	# PhD
3	#DVM

### UNDERGRADUATE STUDENTS:

*Undergraduate Senior Honors Thesis \*indicates matriculation to DVM program*

Jack Powel, Spring 2021 – ongoing, "A Study on the Mental Health Crisis in the Field of Veterinary Medicine", Thesis improvement grant (\$400) submitted September 2021.

Julia Love, preliminary approval Fall 2021, "Domestic animal models for wild felid reproduction - understanding fertility regulation in felid animal models and wild cat populations" Co-advised by Dr. Barb Wolfe

Lexxee Wilson, Fall 2020-2021 "Building teaching models for equine biomechanics"

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 published in Frontiers in Veterinary Science November, 2021.**

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 Evatz\*, 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". **Published 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:

*Jason Frederick Martin. CSU DVM Class 2020, Fall 2020 official start of BMS PhD Anatomy Education. Jason's PhD work will be focused on strategies for successful learning outcomes following integration of virtual reality anatomical teaching tools in veterinary education. Preliminary exams scheduled for January 2022.*

*Department of Biomedical Sciences Master of Science (1 year, MS-B) program, 19 students, 2012-current*

Academic Advisor for animal anatomy concentration students. This includes MS-B program admissions, student support, mentorship, and grading of annual Comprehensive Exams in animal anatomy. Most students are applying to veterinary school and hoping to demonstrate academic capacity to DVM admissions panels.

*Viviane C Leite Gomes. PhD student in Clinical Sciences at Louisiana State University, Baton Rouge, LA. 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. Preliminary exam completed August 2021.*

*Saleh Salman, Master of Science in Animal Science at CSU, 2018-2019. Fulbright Scholar. PhD at University of Connecticut started Fall 2019.*

*Sophia Nelson. 2015-2016. Master of Science in Student Affairs in Higher Education. Unique, joint program designed for Ms. Nelson to allow her to complete the MS prior to matriculating to CSU DVM program Fall 2015.*

*DVM Faculty Advising program. Avg 1-2 DVM students/year. 2013-current. Advising relationship initiated either prior to DVM program enrollment or in Year 1. Provide faculty mentorship until graduation.*

#### **POSTDOCTORAL STUDENTS/RESEARCH ASSOCIATES:**

2019-present Olivia Arnold, PhD, (Department of Environmental and Radiological Health Sciences, CSU)

2017-2020 Kelly S. Kirkley, DVM, PhD – co-advised with Dr. Colin M. Clay

#### **FACULTY MENTORING:**

2019-present Kimberley Jeckel, PhD (Department of Biomedical Sciences, CSU)

#### **LETTERS OF RECOMMENDATION (since 2012): 33 total student letters in 2021**

- DVM program applicants (VMCAS +/- supplemental packets), 15-20 annually)
- DVM students seeking externship or research opportunities, 5-10 annually
- Other requests from students, 2-3 annually

#### **OTHER EVIDENCE OF ADVISING EXCELLENCE:**

2017-20 - Nomination for Jack E. Cermak Advising Award

### **CV SECTION 4: Evidence of Outreach/Service/Engagement**

#### **COMMITTEES**

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

2021

*Clinical Sciences Department Equine Ambulatory Clinician, Search Committee Member, first search failed, second search resulted in the hire of Dr. Anna Bracken (a former MSB student and anatomy GTA)*

*Spur-Vida-Content Creation and Review – I work closely with Kathryn Venzor (CSU Spur Director of Education) to create novel content for the Vida Center. In addition to creating storylines for veterinary cases, the VVET team has created anatomical models, videos, and other content to support outreach at Vida. The 40 Oculus Quest 2 VR headsets with VAA-VR that purchased with VVET funds for BMS531 in 2021 are being used to launch the VR learning center at Vida in 2021. In return for my efforts and those of Andrea Linton and Andrew Garrett, AL and AG are supported by Spur funds.*

2019-present

*CVMBBS Representative to CSU's Faculty Council (2 year term) – unable to attend meetings in person Fall 2021*

*DVM Curriculum Renewal Committee (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 drafted a strategic plan in 2020 for DVM curricular changes - see a 2020 letter from Task Force Co-Chair, Dr. Paul Avery (<https://christianmamagee.com/service-%26-outreach>); In 2021 I have provided leadership in the development of the Endocrinology, Reproduction, and Biomedical Building Blocks sections.*

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 was 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**

2021

Director of Animal Anatomy Programming and Strategic Planning (since 2019). 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), Student anatomy embalming technicians (Damon Mango, Jade Johnson, Paulina Svec, Sam Keum).

Assistant Head/Chair of the DVM & Clinical Services Committee, (since 2017)

Research and Facilities Committee, since 2015

Graduate Education Committee, since 2013. MS-B Steering and Admissions Sub-Committees – 2013-ongoing; PhD Education Curriculum Task Force, 2020-ongoing.

2020

CVMSB Assistant Dean for Outreach, Search Chair, (Hired Wade Ingle)

CSU/CU MD program Educational Specialist, Search Committee Member, (Hired Ellen Aster)

2019

BMS Department Head Search Committee, (Hired Bret Smith)

DVM Instructional Technologist Search Committee (Hired Sonja Berkenpas)

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, aligned around the college strategic plan, for both anatomy and physiology.

2017

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

2014

Program Review Committee

## **PROFESSIONAL AFFILIATIONS AND ACTIVITIES**

2019-present Teaching Academy Fellow, Consortium of West Region Colleges of Veterinary Medicine, member of Faculty Development Working Group

2016-present Colorado State University Center for the Analytics of Learning and Teaching, PI for 3D Visualization in Domestic Gross Anatomy.

2007-present American College of Theriogenologists, Question Development Committee member 2008-2011

2006-present Society for Theriogenology

2009-2014 The Endocrine Society

2007-2014 Society for the Study of Reproduction,

Licensed to practice veterinary medicine with USDA certification\* in Colorado\*, Massachusetts\*, and New Hampshire

## **Scientific Journal Reviewer (since 2018)**

Journal of Neuroendocrinology (1 in 2021)

American Journal of Physiology-Regulatory, Integrative and Comparative Physiology (1 in 2020, 1 in 2021)

Clinical Theriogenology (1 in 2020)

Anatomical Sciences Education (1 in 2020)

Domestic Animal Endocrinology (1 in 2020)

Anatomia, Histologia, Embryologia (2 in 2020)

Biology of Reproduction (1 in 2019)

European Journal of Obstetrics & Gynecology and Reproductive Biology (1 in 2018)

Reproduction (1 in 2018)

Theriogenology (1 in 2018)

## **OUTSIDE REVIEWER FOR PROMOTION AND TENURE**

2021

- Faculty person from Utah State University, DVM/PhD faculty with DVM teaching in the basic sciences (immunology and reproductive endocrinology)
- Faculty person from Western College of Veterinary Medicine, PhD in educational leadership and DVM teaching in anatomy

## **OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH (since 2015)**

### *Zoetis Virtual-Pre-Vet Discovery Institute, College of Veterinary Medicine and Biomedical Sciences, CSU, Summer 2021*

The in-person camp was put on hold due to the pandemic, so I lead a team that developed a virtual camp designed around exploration of topics in One Health. Approximately 40 students from high schools in the Western Consortium explored an “outbreak” and interacted with faculty experts to solve the outbreak. Campers met from 9-12 daily for 5 days to develop skills to solve this novel problem as well as explore major themes including 1) exploration of the veterinary profession, 2) pathways to veterinary medicine; 2) topics in veterinary medicine including debt awareness and repayment programs, wellness, leadership and communication skills. Participants received 1 academic credit for their efforts through CSUOnline as VMBS180A1. We have also secured additional funding (\$30,000) from Zoetis for continued development and delivery of the in-person version of the program to merge the previously designed Camp (see below) with this academic program.

### *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 designed 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 – this program will be modified for 2022 to include the One Health and personal development curriculum from the Zoetis program delivered in 2021.

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

Summer 2016-2019; cancelled 2020-21 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 2020-21 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. 2021 marks the program’s fourth 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, 2021: Led a 2 hour Suture Clinic for 20 MS students using the Canvas teaching module. Assisted by 2-3 other PA/MD/DVMs

*Suture Clinic Level 1, Canvas Course and Suture Skills Program Offering*

November 2021: Worked with PreMedica student club president to offer Level 1 in December 2021 and plans for additional offerings with BSA and PreVet club for 2022. Goal remains student club collaboration.

November 2019: I convinced the two student organizations (BMS Student Association and PreVet Club) 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 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?*

2021 – Grades 5-8, Saint Joseph's Catholic School, Fort Collins, CO, in-class outreach for > 80 students with both anatomy specimens as well as 20 VR Oculus Quest 2 headsets using VAA-VR with CVMBS Outreach staff as a trial for SPUR Vida

2019 - 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*

**Appendix 1 - Materials for External Peer Review of Teaching** was been prepared as instructed by the Western Consortium Regional Teaching Academy's guidelines for external peer review in 2020. This document is accessible from a Google Drive using this [link](#).