



EQUINE REPRODUCTION
LABORATORY
COLORADO STATE UNIVERSITY

EQUINE THERIOGENOLOGY RESIDENCY PROGRAM

3-Years

[July 15, 2023 to July 14, 2026]

Department of Clinical Sciences
College of Veterinary Medicine and
Biomedical Sciences
Colorado State University
Ft. Collins, CO 80521

Program Description

The Department of Clinical Sciences at Colorado State University offers a **3-year** clinical residency in Equine Theriogenology that will start on July 15, 2023 and end on July 14, 2026. The goals of the program are to provide the candidate with an opportunity to develop significant clinical expertise in all areas of equine reproduction and to prepare residents for a future career in academic or specialty private practice. Residents are expected to be active participants in ongoing programs in clinical equine reproduction, teaching, continuing education, and research. The program will have 3 residents with a new resident starting in mid-July every year. Consequently, at any given time there should be a third year, a second year and a first year Equine Theriogenology resident. The residency program will be based at the Equine Reproduction Laboratory on the Foothills Campus of Colorado State University. The home department for the residency is the Department of Clinical Sciences, which is based at the Veterinary Teaching Hospital, located on the South Campus of Colorado State University.

Application

Applications for the residency program should include the following:

- a) Letter of intent
- b) Resume or curriculum vitae
- c) Transcripts from veterinary school
- d) Three (3) letters of recommendation

Please send all materials by email to Dr. Patrick McCue pmccue@colostate.edu
Completed applications are due ***Friday December 2, 2022***.

Note: The Equine Theriogenology Residency program at Colorado State University is not part of the Veterinary Internship and Residency Matching Program (VIRMP).

Faculty involved in Equine Reproduction at Colorado State University

Department of Clinical Sciences:

- Patrick McCue, DVM, PhD, Diplomate ACT
- Jennifer Hatzel, DVM, MS, Diplomate ACT

Department of Biomedical Sciences:

- Elaine Carnevale, DVM, PhD
- Colin Clay, PhD
- James Graham, PhD
- Tod Hansen, PhD (ARBL Director)
- Torrance Nett, PhD
- Rao Veeramachaneni, BVSc, MScVet, PhD

Graduate Program

Degree:

Residents in equine reproduction will concurrently be enrolled in a Master's Degree (Plan B or non-thesis Master's program). The Master's program involves coursework, active participation in research projects, and preparation of one (or more) manuscripts for publication based on original research, case reports, retrospective studies, or review articles. Although no thesis needs to be written or defended, the resident is expected to present results of their research project(s) at a departmental (Clinical Sciences) seminar.

Coursework:

Formal coursework for the Master's degree is dependent on the interest and experience of the resident. A resident in Equine Reproduction would be expected to take courses in reproductive physiology, endocrinology and statistics among other courses.

Residents are typically Teaching Assistants (TAs) in the Foaling Management course (ANEQ 445) and the second year resident is actively involved in scheduling of foal watch and pregnant mare student group assignments for that course.

Courses in reproduction and related fields include (other courses are also possible):

Course Number	Credits	Course Title
ANEQ 344	4	Equine Reproduction
ANEQ 445	2	Foaling Management
BMS 430	3	Endocrinology
BMS 500	4	Mammalian Physiology I
BMS 501	4	Mammalian Physiology II
BMS 521	3	Comparative Reproductive Physiology
BMS 631	2	Mechanisms of Hormone Action
BMS 632	2	Metabolic Endocrinology
BMS 640	5	Reproductive Physiology and Endocrinology

BMS 642	1	Research Techniques for Gametes and Embryos
BMS 643	2	Applied Andrology
BMS 792C	1	Seminar (Animal Reproduction & Biotech. Lab)
BMS 796C	1	Equine Reproduction Journal Club - Group Study
BC 560	4	Molecular and General Genetics
BC 565	4	Molecular Regulation of Cell Function
MIP 300	3	General Microbiology
MIP 760	3	Mechanisms of Bacterial Pathogenesis
ST 511A or B	4	Design and Data Analysis for Researchers-I
VS 562	3	Applied Data Analysis
VS 628	3	Physiology and Pathophysiology
VS 644	2	Principles of Theriogenology
VS 792	1	Seminar (Clinical Sciences) at the VTH
VS 795H	1 to 5	Independent Study: Large Animal Reproduction

Credits:

Information on number of credits and type of credits for course work, research and other academic endeavors is available through the Department of Clinical Sciences. Currently, graduate student requirements consist of:

- At least 16 credits must be in 500 or higher level courses; of the 16 credits, at least 12 credits must be in 500 or higher level regular courses
- 30 credit hours total

Financial Support, Tuition, Fees, Salary and Health Insurance

Salary Support:

Salaries for 1st, 2nd and 3rd year residents are currently \$ 40,170, \$ 42,930 and \$ 44,520 per year, respectively, prior to mandatory deductions for taxes and retirement. This may be adjusted in the future by the university. Additional information regarding the salary for a resident at CSU may be obtained by contacting Mandy Casteel-Denney (Mandy.Casteel-Denney@colostate.edu) in the Department of Clinical Sciences.

Tuition:

Tuition for the Master's Degree will be provided by Colorado State University.

Benefits

Postdoctoral Fellows (Veterinary Residents) with appointments of half-time or greater are eligible for a suite of benefits including: Medical, Dental, Vision, and Disability Insurance, Life and Voluntary Accidental Death Insurance, participation in Flexible Spending Reimbursement Accounts, Sick Leave accrual and Employee Study Privilege. Enrollment in a retirement plan is required and is effective upon the date of employment, and includes an employer match starting in year 2 of at least half-time employment.

More information can be obtained from the CSU Benefits Office and Human Resources Office or Mandy Casteel-Denney (Mandy.Casteel-Denney@colostate.edu) in the Department of Clinical Sciences.

Licensure

A veterinary resident will either have to obtain an Academic Veterinarian License or a standard State of Colorado Veterinary License to practice at Colorado State University. Guidelines for obtaining an Academic Veterinarian License are outlined in the box below.

<p>By checking at least one box below, I hereby certify that pursuant to Board Rule II.D, I can demonstrate current clinical competency and professional ability through the method described:</p> <ul style="list-style-type: none"><input type="checkbox"/> Graduated within the 12 months immediately preceding receipt of this application in the Division with a DVM degree from a school or college of veterinary medicine accredited by the AVMA at the time of my graduation; —OR—<input type="checkbox"/> Earned a certificate from either ECFVG or PAVE within the 12 months immediately preceding application receipt date; —OR—<input type="checkbox"/> Passed the NAVLE within one (1) year of application receipt date; —OR—<input type="checkbox"/> Engaged in the active licensed clinical practice of veterinary medicine since original license in another jurisdiction was issued (if less than three (3) years); —OR—<input type="checkbox"/> Engaged in the active licensed clinical practice of veterinary medicine in another jurisdiction for at least three (3) years of the five (5) years immediately preceding application receipt date; —OR—<input type="checkbox"/> Engaged in teaching veterinary medicine in an accredited program for at least three (3) years of the five (5) years immediately preceding application receipt date; —OR—<input type="checkbox"/> Engaged in service as a veterinarian in the military for at least three (3) years of the five (5) years immediately preceding application receipt date; —OR— <p>Other methods requiring <u>prior</u> Board approval:</p> <ul style="list-style-type: none"><input type="checkbox"/> Successful completion of a <u>Board-approved</u> evaluation by an AVMA accredited institution within one (1) year of application receipt date; —OR—<input type="checkbox"/> Practice under a probationary or otherwise restricted license for a specified period of time; —OR—<input type="checkbox"/> Successful completion of courses <u>approved by the Board</u>; —OR—<input type="checkbox"/> Any other professional standard or measure of continued competency as <u>determined by the Board</u>, including successful completion of species-specific examination(s).
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Resident Activities

Clinical Reproduction Program:

- Trailer-in mare clients (ultrasound exams, artificial insemination, etc.)
- In-house mare clients (broodmare management and foaling)
- Mare breeding soundness evaluations (BSEs)
- Embryo transfer (ET) program
- Semen collection and evaluation
- Stallion breeding soundness evaluations (BSEs)
- Semen freezing
- Oocyte collection (OPU) for intracytoplasmic sperm injection
- Herd Health program (deworming, vaccination, branding)
- Emergency medicine at the ERL (colics, lacerations, lameness, etc)

On-Call Schedule:

With 3 residents at the ERL, each residents will be on call for night duties and week-end duties every third week/weekend.

Teaching Program:

- Residents are expected to actively participate in teaching students.
- Senior (4th year) veterinary students - elective rotation (spring semester)
- Junior (3rd year) veterinary students - elective rotation (fall semester)
- Undergraduate Equine Sciences and Animal Sciences students
- Graduate Students in Biomedical Sciences and Animal Sciences

Short Course/Continuing Education Program:

- Residents have an active role in organizing and teaching in CE programs.
 - Embryo transfer (veterinarians only)
 - Problem mare course (veterinarians only)
 - Equine Reproduction ‘ Boot Camp’ (veterinarians only)
 - Reproductive management and artificial insemination
 - Frozen stallion semen

Research Program:

- Participate as principle investigator on *at least* one research project
 - Original research
 - Retrospective study
- Assist other graduate students and faculty with research projects

Veterinary Hospital Support:

Residents will provide Equine Theriogenology support to the Johnson Family Equine Hospital (JFEH).

Additional Resident Activities

Veterinary Teaching Hospital (VTH) Seminar:

Register for and attend VTH Resident Seminar (every Thursday morning) for *4 semesters* and present a seminar *twice* during the during the 3-year residency program or as required by the Department of Clinical Sciences.

ARBL Seminar: (Animal Reproduction and Biotechnology Laboratory)

Register for and attend the ARBL seminar series *every semester* (Spring and Fall) each year.

Other Theriogenology Training available (at CSU or off campus):

- Dairy cattle
- Beef cattle
- Bovine obstetrics (Calving Management)
- Small animal
- Small ruminant and camelids

Additional Expectations or Suggested Goals:

- Present at least one didactic lecture to veterinary students in the second or third year of the residency, typically either in the Foaling Management course or the Theriogenology course.
- Present a paper at a national meeting based on original research, a retrospective study or a topic review (2nd or 3rd year or post-residency).
- Submit at least one research article for publication in a peer-reviewed journal.
- Become proficient with pathologic diagnosis and clinical interpretation of equine endometrial biopsies (Veterinary Diagnostic Laboratory).

Timeline

Year	Primary Responsibility	On Call Duty
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1	Stallion Service	Every Third Week and Every Third Weekend
2	Mare Service	Every Third Week and Every Third Weekend
3	Assisted Reproduction Service	Every Third Week and Every Third Weekend

Year 1 (Summer):

July 15 is the onset of the residency program. The first few days will involve Orientation along with Residents from other Services. The new resident should assist the faculty and the second-year resident with clinical cases (in-house and trailer-in appointments) of both stallions and mares. The first year resident will have a **primary responsibility** in the **Stallion Service**, and should be involved in as many stallion handling, semen collection, semen evaluation and semen freezing opportunities as possible. In addition, the first year resident should avail themselves whenever stallion breeding soundness evaluations (BSE) are being conducted. The first-year resident will have **secondary responsibility** in the **Mare Service** and a **tertiary responsibility** in the **Assisted Reproduction Service**. Significant clinical skills in palpation and ultrasonography will be developed by helping to monitor the embryo transfer recipient herd. Techniques of embryo collection, handling and transfer should be developed.

Active participation in ongoing research projects of faculty or other graduate students is encouraged. No class work is typically performed in the summer.

Year 1 (Fall):

A moderate to heavy course load is suggested as clinical reproduction activity is light. A graduate committee should be formed and initial meetings held to discuss coursework and potential research projects. The first year resident should continue to participate in stallion and mare evaluations. At least one stallion BSE should be performed by the first year resident and a summary letter written to the client (evaluated and co-signed by a faculty member).

Year 1 (Spring):

A light class load is suggested. The first year resident is expected to help manage trailer-in clientele and actively participate in the in-house reproduction cases. In addition, the first year resident will play a significant role in the clinical foaling program and be a teaching assistant for the Foaling Management course. It is encouraged that the first year resident participates in a Calving Management rotation during the spring to develop obstetrical skills.

Year 2 (Summer):

No class work in summer.

The second year resident is expected to have a **primary responsibility** in the clinical **Mare Service** (mares bred to carry their own pregnancy, embryo transfers and foaling mares), with a **secondary responsibility** in the **Stallion Service** and begin to help in the **Assisted Reproduction Service** as needed or as available.

Learn to freeze equine embryos (if not known already). Continue ongoing original research projects. Manage a select number of in-house mare cases independently.

Year 2 (Fall):

Moderate course load (if needed). Light clinical duty involving mare BSEs and trailer-in clients. Present research paper at SFT if possible. Begin to study for ACT board exam.

Year 2 (Spring):

No course work anticipated. Focus on clinical duties. The resident is expected to complete a mare BSE and write a case summary for client (to be evaluated and co-signed by a faculty member).

Year 3 (Summer):

No class work in summer.

The third year resident is expected to have a **primary responsibility** in the clinical **Assisted Reproduction Service** (oocyte collection, ICSI), with a **secondary responsibility** in the **Stallion Service** and **Mare Service** as needed or as available. The third-year resident will have rotations as the primary clinician on the Mare Service.

The clinical goals for Year 3 of the Residency include, but not limited to, management of mares and development of clinical skills in ART, including but not limited to oocyte aspiration, intracytoplasmic sperm injection (ICSI), semen processing for ART, preparation of ICSI doses of semen, semen freezing and re-freezing, collection of oocytes from excised ovaries, cryopreservation of *in vitro* produced equine embryos and transfer of equine embryos.

Complete original resident research project(s) and assist with ongoing ART research projects.

Year 3 (Fall/Winter):

Limited coursework (as needed). Finalize and submit original research paper to a peer reviewed journal. Present research paper at SFT or AAEP if possible. Study for ACT board exam. Consider participating in other Theriogenology programs on the CSU campus or in nearby private practices (i.e. canine, bovine, etc.).

Year 3 (Spring):

No course work anticipated. Residents must present a formal seminar to the Department of Clinical Sciences based on their resident research project(s). Serve approximately one week per month as the primary veterinarian on the Mare Service managing in-house mares and/or trailer-in mare appointments.

Professional Meetings and Miscellaneous Support

- The Department of Clinical Sciences and the Equine Reproduction Laboratory will provide combined funding for one domestic professional meeting in the second or third year of the residency. Funding will include travel (i.e. economy air), registration, housing and meals. Residents are encouraged to

attend the annual conference of either the American Association of Equine Practitioners or the Society for Theriogenology. Limited funding may also be available to attend other meetings as well.

- The ERL will also provide limited funding for clothing to be worn during clinical service duties (i.e. work shirts).

Memberships in Professional Organizations

Residents are encouraged to become members of the Society for Theriogenology and the American Association of Equine Practitioners. Residents are responsible for providing their own funding for membership in these organizations.

Board Certification Program

Residents are strongly encouraged to register for and actively study for the certifying examination for the American College of Theriogenologists while in their residency program. Residents qualify to take the examination after successful completion of the second year of the Residency Program or can take the exam after the Residency is completed.

Meetings for Evaluation and Guidance

Faculty Advisor	Months	1, 6, 12, 18, 24, 30
Resident's Committee	Months	4, 12, 24, 36

It is the responsibility of the resident to schedule the above meetings. Residents will have an opportunity to evaluate the program at the end of each year.

Employment

CSU is an EO/EA/AA employer and conducts background checks on all final candidates.

Updated: October 24, 2022