EQUINE THERIOGENOLOGY

RESIDENCY PROGRAM
Three-Years
July 1, 2019 to June 30, 2022

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 three-year clinical residency in Equine Theriogenology that will start on July 1, 2019 and end on June 30, 2022. 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 three residents with a new resident starting every July 1. 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.

Application

Applications for the residency program should include the following:

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

Please send all materials by email to Dr. Patrick McCue pmccue@colostate.edu
Completed applications are due December 15, 2018.

Applicants planning to attend the Annual Convention of the American Association of Equine Practitioners (AAEP) in San Francisco, CA December 1-5, 2018 are encouraged to make arrangements by email to meet with Dr. McCue (pmccue@colostate.edu) at the conference.
Faculty involved in Equine Reproduction at Colorado State University

Department of Clinical Sciences:
- Patrick McCue, DVM, PhD, Diplomate ACT, Iron Rose Ranch Professor of Equine Reproduction (Residency program coordinator)
- Jennifer Hatzel, DVM, MS, Diplomate ACT

Department of Biomedical Sciences:
- Gerrit Bouma, PhD, Associate Professor
- Elaine Carnevale, DVM, PhD, Associate Professor
- Colin Clay, PhD, Professor
- James Graham, PhD, Professor
- Tod Hansen, PhD, Professor, ARBL Director
- Torrance Nett, PhD, Professor
- George Seidel Jr., PhD, Professor

Department of Animal Sciences:
- Jerry Black, DVM, ERL Director; Director of Undergraduate Studies
- Jason Bruemmer, PhD, Professor

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 2 (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 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 and the second year resident is actively involved in scheduling of foal watch and pregnant mare student group assignments.
Courses in reproduction and related fields include (other courses are also possible):

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANEQ 344</td>
<td>4</td>
<td>Equine Reproduction</td>
</tr>
<tr>
<td>ANEQ 445</td>
<td>2</td>
<td>Foaling Management</td>
</tr>
<tr>
<td>BMS 430</td>
<td>3</td>
<td>Endocrinology</td>
</tr>
<tr>
<td>BMS 500</td>
<td>4</td>
<td>Mammalian Physiology I</td>
</tr>
<tr>
<td>BMS 501</td>
<td>4</td>
<td>Mammalian Physiology II</td>
</tr>
<tr>
<td>BMS 631</td>
<td>2</td>
<td>Mechanisms of Hormone Action</td>
</tr>
<tr>
<td>BMS 632</td>
<td>2</td>
<td>Metabolic Endocrinology</td>
</tr>
<tr>
<td>BMS 640</td>
<td>5</td>
<td>Reproductive Physiology and Endocrinology</td>
</tr>
<tr>
<td>BMS 642</td>
<td>1</td>
<td>Research Techniques for Gametes and Embryos</td>
</tr>
<tr>
<td>BMS 643</td>
<td>2</td>
<td>Applied Andrology</td>
</tr>
<tr>
<td>BMS 680</td>
<td>3</td>
<td>Comparative Reproductive Physiology</td>
</tr>
<tr>
<td>BMS 796C</td>
<td>1</td>
<td>Equine Reproduction Journal Club - Group Study</td>
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<tr>
<td>BC 560</td>
<td>4</td>
<td>Molecular and General Genetics</td>
</tr>
<tr>
<td>BC 565</td>
<td>4</td>
<td>Molecular Regulation of Cell Function</td>
</tr>
<tr>
<td>MIP 300</td>
<td>3</td>
<td>General Microbiology</td>
</tr>
<tr>
<td>ST 511</td>
<td>4</td>
<td>Design and Data Analysis for Researchers-I</td>
</tr>
<tr>
<td>VS 562</td>
<td>3</td>
<td>Applied Data Analysis</td>
</tr>
<tr>
<td>VS 644</td>
<td>2</td>
<td>Principles of Theriogenology</td>
</tr>
<tr>
<td>VS 792</td>
<td>1</td>
<td>Seminar (Clinical Sciences)</td>
</tr>
</tbody>
</table>

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.

**Financial Support, Tuition, Fees, Salary and Health Insurance**

**Salary Support:**

Funding for two resident are provided by the Department of Clinical Sciences. Financial support for the third resident will be provided by a combination of endowed scholarships available through the Departments of Biomedical Sciences and/or Clinical Sciences, funding from the clinical reproduction program and other sources as available.

Salaries for 1st, 2nd and 3rd year residents are currently $32,500, $33,500 and $35,000 per year, respectively, prior to mandatory deductions for taxes and retirement. Additional information regarding the salary for a resident at CSU may be obtained by contacting Morna Mynard (Morna.Mynard@colostate.edu) 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 Morna Mynard (Morna.Mynard@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.

Resident Activities

Clinical Reproduction Program:

- Trailer-in clients (ultrasound examinations, artificial insemination, etc.)
- In-house clients (broodmare management and foaling)
- Embryo transfer (ET) program
Semen collection and evaluation
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:
If there are three residents at the ERL, each residents will be on call for night duties and week-end duties every third week/weekend.

Teaching Program:
Senior (4th year) veterinary students - elective rotation
Junior (3rd year) veterinary students - elective rotation
Undergraduate Equine Sciences and Animal Sciences students
Graduate Students in Biomedical Sciences and Animal Sciences

Short Course/Continuing Education Program:
Embryo transfer for veterinarians
Problem mare course for veterinarians
Reproductive management and artificial insemination for horse owners
Frozen semen for horse owners and veterinarians

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 Teaching Hospital Support:
Residents will provide Equine Theriogenology support to the Veterinary Teaching Hospital.

Additional Resident Activities

Seminar:
Attend VTH Resident Seminar (every Thursday morning) and present a seminar once per year, or as required by the Department of Clinical Sciences.

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 lecture to horse owners in Colorado or surrounding states in the second year of the residency.
- Present at least one didactic lecture to veterinary students in the second 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 one research article for publication in a peer-reviewed journal.
- Submit one case report or “Theriogenology Question of the Month” to JAVMA or another peer-reviewed journal.
- Submit one article on equine reproduction to a lay publication.
- Become proficient with pathologic diagnosis and clinical interpretation of equine endometrial biopsies (Veterinary Diagnostic Laboratory).

### Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Primary Responsibility</th>
<th>On Call Duty</th>
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<tbody>
<tr>
<td>1</td>
<td>Stallion Service</td>
<td>Every Third Week and Every Third Weekend</td>
</tr>
<tr>
<td>2</td>
<td>Mare Service</td>
<td>Every Third Week and Every Third Weekend</td>
</tr>
<tr>
<td>3</td>
<td>Assisted Reproduction Service</td>
<td>Every Third Week and Every Third Weekend</td>
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**Year 1 (Summer):**

July 1 is the onset of the residency program. 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 expected 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. 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. 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 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. Write a case report and potentially submit for publication. Begin to study for ACT board exam.

**Year 2 (Spring):**
No course work anticipated. Focus on clinical duties.

**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.

Learn to collect oocytes (OPU), and other ART procedures. Complete ongoing original research projects. Manage a select number of in-house ART mare cases independently. Write a lay article and submit for publication.

**Year 3 (Fall):**
Limited coursework (as needed). Present research paper at SFT or AAEP if possible. Write a case report and potentially submit for publication. Study for ACT board exam.

**Year 3 (Spring):**
No course work anticipated. Submit manuscript on original research.

**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.

- 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. Graduate veterinarians are qualified to take the examination after successful completion of a residency program (i.e. residents that finish on June 30 will be able to take the examination that fall).

**Meetings for Evaluation and Guidance**

<table>
<thead>
<tr>
<th>Faculty Advisor</th>
<th>Months</th>
<th>1, 6, 12, 18, 24, 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident’s Committee</td>
<td>Months</td>
<td>4, 12, 24, 36</td>
</tr>
</tbody>
</table>

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 1, 2018