RESIDENCY TRAINING PROGRAM REGISTRATION
2018-2019
NEUROLOGY

Part One

New applications for ACVIM Residency Training Programs must be received by the Residency Training Committee (RTC) 90 days prior to any residents beginning training. Before completing this form, please review the general and specific requirements for Neurology Residency Training Programs in the ACVIM Certification Manual (CM). The current version of the CM is available on the ACVIM website at www.ACVIM.org.

Prior to making significant changes in a Residency Training Program, approval of the ACVIM and Neurology RTC must be obtained. The Candidate and/or Program Director must notify ACVIM, in writing before the changes are made to ensure that the proposed changes are approved. Significant changes could include, but are not limited to the following: changes in Program Director or advisors, transferring from one program to another, alterations in program duration, locations of secondary site training, switching to a 'dual board' program, or enrolling in an institutional graduate program.

Notice: The data collected in this form is necessary both for the ACVIM to maintain its accreditation as a Registered Veterinary Specialty Organization and also is required for renewal of the residency training program. Some of the data collected is required of every specialty and some is specific to the specialty of Neurology.

For multi-site residency programs: To ensure uniformity of training and compliance with current CM requirements, training programs that include multiple sites must provide detailed information regarding supervision and facilities available at each specific site(s). Multi-site programs, if any, will be addressed by the Program Director in Part Two.

Program Director Name :	Rebecca Packer

Must be a Diplomate of ACVIM in the Specialty of Neurology or an approved Diplomate of the European College of Veterinary Neurology (ECVN) for at least 5 years with 3 years' experience training residents

Program Director Contact Information:

Work Phone:	(970) 297-5000
E-mail:	rebecca.packer@colostate.edu
Mailing Address:	1678 Campus Delivery Colorado State University Ft. Collins, CO 80523-1678

1. Location of Sponsoring Institution (Primary Site of Training Program):

Primary Site Location:	Length of Training Program:
Colorado State University Non Traditional	2 year

2. Resident Advisor(s): Must be a Diplomate of ACVIM in the Specialty of Neurology or a Diplomate of the ECVN and boarded for at least one year. Each RA advises and supervises no more than two residents at one time.

Lisa Bartner
Stephanie McGrath
Rebecca Packer

3. Supervising Diplomates: Must be a Diplomate of ACVIM in the Specialty of Neurology or a Diplomate of the ECVN. The supervising diplomate must be active in the practice of the specialty and must maintain clinical competency in the field. **The sponsoring**

institution must provide resident with onsite presence of any combination of at least two ACVIM or ECVN Neurology Diplomates with full-time clinical responsibilities.

Lisa Bartner - Neurology Stephanie McGrath - Neurology Rebecca Packer - Neurology

4. All Diplomates of ACVIM or ECVIM responsible for supervision of clinical training who specialize in areas other than Neurology.

Name and Specialty	Comments
Marisa Ames - Cardiology Kursten Pierce - Cardiology Brian Scansen - Cardiology Robert Callan - LAIM Franklyn Garry - LAIM Gabriele Landolt - LAIM Yvette Nout-Lomas - LAIM Katharine Simpson - LAIM Elsbeth Swain - LAIM David Van Metre - LAIM Susan Lana - Oncology Rodney Page - Oncology Douglas Thamm - Oncology Kristen Weishaar - Oncology Steven Dow - SAIM Kristy Dowers - SAIM Michael Lappin - SAIM Rod Rosychuk - SAIM Sara Shropshire - SAIM Stacie Summers - SAIM Julia Veir - SAIM Craig Webb - SAIM Sara Wennogle - SAIM	

5. Residents currently participating in your training program, along with the beginning date of the program, expected ending date of the program, and designated Resident Advisor.

Resident Name	Start date (mm/dd/yyyy)	End Date (mm/dd/yyyy)	Resident Advisor Name*
Ian Wachowiak	7/15/19	7/14/21	Lisa Bartner

RESIDENCY TRAINING PROGRAM REGISTRATION
2019-2020
NEUROLOGY

Part Two

Part Two of the Neurology Residency Training renewal process addresses general features of the program that apply to all current residents. These questions will be used to provide the Residency Training Committee with information needed to judge the structure, quality, scope, and consistency of training provided.

Current Date:	22 Jan 2019
Program Director Name:	Rebecca A Packer, MS, DVM, DACVIM (Neurology)
Program Director Email Address:	rebecca.packer@colostate.edu

Must be a Diplomate of ACVIM in the Specialty of Neurology or an approved Diplomate of the European College of Veterinary Neurology (ECVN) for at least 5 years with 3 years' experience training residents

Name of Sponsoring Institution (Primary Site):	Colorado State University

1. Length of Training Program:

	Yes
2 years	☒
3 years	☐
Other -provide details	(3 years total, but Year 1 was completed at Michigan State University; the resident is transferring programs and Years 2 and 3 will be completed at Colorado State University).

2. Advanced Degree:

	Yes	No	Optional
Masters:	☐	☐	☒
PhD:	☐	☐	☒

Briefly explain how the degree is integrated into the residency program:

A non-thesis Masters Degree used to be required of all residency programs within the Department of Clinical Sciences; however, recently the Master's degree (either thesis or non-thesis) has been made optional as determined by each service. Neurology will continue to encourage residents to complete a Master's degree as this provides a comprehensive array of graduate courses that prepare residents for board examinations as well as to be well-rounded specialist clinicians. Those courses pertinent to board preparation are considered required by the Neurology service for all residents, regardless of enrollment in the MS degree (biostatistics, seminar, post-graduate medicine, neuropathology, electrophysiology, neurosurgery). A PhD degree is also offered and optional, but may add additional time to the training program (3 year residency plus additional time to complete the PhD). International residents are required to enroll in the MS program due to visa eligibility. Salary for the residency/MS portion is guaranteed; salary for the PhD component is dependent on project funding and should be discussed at the time of application. Available courses include biostatistics, neurosurgery, neuropathology, advanced imaging, radiation therapy, post-graduate medicine (small animal internal medicine specialties), physiology, electrophysiology, and others.

3. Please list all ACVIM, ECVIM or ECVN Supervising **Diplomates** (Cardiology, Large Animal Internal Medicine, Neurology, Oncology, Small Animal Internal Medicine) providing supervision **off-site** and explain the situation and the agreements provided for contact with the resident. (Note, in Part One, current ACVIM/ECVN Supervising Diplomates are included; and you are requested to provide additional comments for off-site supervision here).

Name of Diplomate(s)	Specialty Certifying Body	Comments
See list in Part One for on-site. No additional off-site supervision (N/A).		

4. Please list all **Diplomates** of the American College of Veterinary Pathology or the European College of Veterinary Pathologists in the areas of clinical pathology or gross/histopathology associated with residency training. If off-site, please explain the situation, and the method of providing direct contact with the resident.

Name of Diplomate(s)	Specialty Certifying Body (ACVP or ECVP)	Clinical or Gross	Comments
Andrea Bohn, DVM, PhD, DACVP	All DACVP	Clinical	All on site
Paul Avery, VMD, PhD, DACVP		Clinical	
Gregg Dean, DVM, PhD, DACVP		Clinical	
Amy MacNeill, DVM, PhD, DACVP		Clinical	
Russell Moore, DVM, MS, DACVP		Clinical	
Christine Olver, DVM, PhD, DACVP		Clinical	
Linda Vap, DVM, DACVP		Clinical	
Gary Mason, DVM, PhD, DACVP		Anatomic	
Tawfik Aboellail, BVSc, PhD, DACVP		Anatomic	
Randal Basaraba, DVM, PHD, DACVP		Anatomic	
Patricia Cole, DVM, PhD, DACVP		Anatomic	
Colleen Duncan, DVM, PhD, DACVP, DACVPM		Anatomic	
EJ Ehrhart, DVM, PhD, DACVP		Anatomic	
Chad Frank, DVM, MS, DACVP		Anatomic	
Sushan Han, DVM, PhD, DACVP		Anatomic	
Juan Francisco Munoz Gutierrez, MVZ, PhD, DACVP		Anatomic	
Paula Schaffer, DVM, DACVP		Anatomic	
Terry Spraker, DVM, PhD, DACVP		Anatomic	

5. Please list all **Diplomates** of the American College of Veterinary Radiology or the European College of Veterinary Diagnostic Imaging associated with residency training. If off-site, please explain the situation, and the arrangements for direct contact with the resident.

Name of Diplomate(s)	Specialty Certifying Body (ACVR or ECVDI)	Comments
Elissa Randall, DVM, MS, DACVR Myra Barrett, DVM, MS, DACVR Lynn Griffin, DVM, MS, DACVR Lukas Kawalilak, DVM, DACVR Linda Lang, DVM, DACVR Angela Marolf, DVM, DACVR Kurt Selberg, DVM, MS, DACVR Kelly Mann, DVM, PhD, DACVR Susan LaRue, DVM, PhD, DACVS, DACVR (Radiation Oncology) Keara Boss, DVM, PhD, DACVR (Radiation Oncology) Molly Holmes, DVM, DACVR (Radiation Oncology)	DACVR	All on site

6. Please list all Diplomates available for consultation in the areas of dermatology, surgery, ophthalmology, anesthesiology, emergency/critical care, clinical nutrition, clinical pharmacology, behavior, and/or theriogenology. If off-site, please explain the situation and the arrangements provided for contact with the resident.

Name of Diplomate(s)	Specialty Certifying Body	Comments
Rod Rosychuck, DVM, DACVIM (Dermatology)	DACVIM (D)	All on site
Jennifer Schissler, DVM, MS, DACVIM (Dermatology)	DACVM (D)	
Nicole Ehrhart, VMD, MS, DACVS	DACVS	
Bernard Seguin, DVM, MS, DACVS	DACVS	
Deanna Worley, DVM, DACVS	DACVS	
Dan Smeak, DVM, DACVS	DACVS	
Catriona McPhail, DVM, PhD, DACVS	DACVS	
Sarah Marvel, DVM, MS, DACVS	DACVS	
Eric Monnet, DVM, PhD, DACVS, DECVS	DACVS,DECVS	
Felix Duerr, DVM, MS, DACVS, DECVS, DACVSMR	DACVS, DECVS, DACVSMR	
Nic Lambrechts, BVSc, MMedVet, DECVS, DACVMSR	DECVS, DACVMSR	
Ross Palmer, DVM, MS, DACVS	DACVS	
Clara Goh, BVSc, MS, DACVS	DACVS	
Richard Wheeler, DVM, DACT	DACT	
Jonathan Stockman, DVM, DACVN	DACVN	
Michala de Linde Henriksen, DVM, PhD, DACVO	DACVO	
Kathyrn Wotman, DVM, DACVIM, DACVO	DACVO	
Matt Chavkin, DVM, MS, DACVO	DACVO	
Jesse Eichenbaum, DVM, MS, DACVO	DACVO	
Marlis Rezende, DVM, PhD, DACVAA	DACVAA	
Pedro Boscan, DVM, PhD, DACVAA	DACVAA	
Gregg Griffenhagen, DVM, MS, DACVAA	DACVAA	
Rachel Hector, DVM, MS, DACVAA	DACVAA	
Peter Hellyer, DVM, MS, DACVAA	DACVAA	

Khursheed Mama, DVM, DACVAA Lauren Sullivan, DVM, MS, DACVECC Geoff Heffner, DVM, DACVECC Amanda Cavanaugh, DVM, DACVECC Tim Hackett, DVM, MS, DACVECC Eileen Hackett, DVM, PhD, DACVS, DACVECC (LA) Diana Hassel, DVM, PhD, DACVS, DACVECC (LA) Gabriele Landolt, DVM, PhD, DACVIM (LAIM) Yvette Nout-Lomas, DVM, PhD, DACVIM (LAIM), DACVECC Erin Contino, DVM, DACVSMR (LA) Kevin Haussler, DVM, PhD, DACVSMR (LA) Melissa King, DVM, DACVMSR (LA) Karhryn Seabaugh, DVM, DACVS, DACVMSR (LA) Melinda Story, DVM, DACVS, DACVSMR (LA) Laurie Goodrich, DVM, PhD, DACVS (LA) Dean Hendrickson, DVM, MS, DACVS (LA) Chris Kawcak, DVM, PhD, DACVS, DACVSMR (LA) Valerie Moorman, DVM, PhD, DACVS (LA)	DACVAA DACVECC DACVECC DACVECC DACVECC DACVS, DACVECC (LA) DACVS, DACVECC (LA) DACVIM (LAIM) DACVIM (LAIM), DACVECC (LA) DACVSMR (LA) DACVSMR (LA) DACVSMR (LA) DACVS, DACVSMR (LA) DACVS, DACVSMR (LA) DACVS (LA) DACVS (LA DACVS, DACVSMR (LA) DACVS (LA)	

The following questions will be used to provide the Residency Training Committee with information needed to judge the structure, quality, scope, and consistency of training provided.

NOTE: Direct supervision is required during clinical training, with the time required specified by each particular specialty. Direct supervision is defined as follows: The Supervising Diplomate and resident are participating in a clinical practice in which both the Diplomate and the resident are on duty and interactively and concurrently managing cases. The Diplomate need not personally examine each patient seen by the resident, but must remain physically available for consultation. Please use this definition when responding to the following questions regarding clinical rotations.

7. Is this a traditional or non-traditional residency training program? *A traditional neurology residency is a two (2) or three (3) year postgraduate training program, with a minimum of ninety six (96) weeks of supervised clinical training with a majority of the time spent at one location. A non-traditional neurology residency allows for training that may occur in non-contiguous blocks of time over an extended time period.*

Traditional	☐
Non-traditional	☒

For non-traditional programs, please provide a detailed description of the residency program, including length of program, proposed annual schedule, and the amount of time of direct Diplomate supervision for each location of the residency. The resident must complete the residency in blocks of time no less than four weeks in length and attend a minimum of 20 weeks of training per year. The training period may not exceed a total of five years.

This non-traditional program is being submitted to provide continuation of a program for a resident that has completed Year 1 at Michigan State University, and will be transferring to Colorado State University to complete Years 2 and 3 of their training.

8. The ACVIM Neurology Certification Manual (CM) requires that each resident experience 75 weeks (minimum) of clinical Neurology training under the supervision of either a Diplomate of ACVIM in the Specialty of Neurology or a Diplomate of ECVN. The 75 weeks should include at least 50 weeks of direct supervision (see definition in CM) and the remainder as indirect supervision (indirect supervision is satisfied by the Supervising Diplomate Neurologist being available for face-to-face contact with the resident at least 4 days per week).

Please provide an outline of planned yearly schedule, including number of weeks of direct and indirect supervision (i.e. in year 1, the resident will be directly supervised for 25 weeks etc.) A table similar to the example below outlining the proposed weekly schedule of duties for the residents should be provided:

EXAMPLE TABLE ONLY:

	Year I	*Year II*	*Year III*
*Medical Neurology **			
Neurosurgery			
Neurology/Neurosurgery Direct Supervision	*36*	*36*	
Neurology/Neurosurgery - Indirect Supervision			*34*
Internal Medicine	*4*	*2*	*2*
Clinical Pathology	*2*		
Radiology	*2*		
Neuropathology		*2*	*2*
Other Rotation (please list the name of each rotation)			
_____		*1*	
_____	*2*	*4*	*4*
Research	*4*	*5*	*8*
Independent Study			
Vacation	*2*	*2*	*2*
Total	*52*	*52*	*52*

Numbers indicated are in "weeks".

* Many residencies are a combined neurology / neurosurgery program with no distinct separation between the services. Some programs, however, have separate training with a surgery service and this example includes that possibility in describing the weekly rotations.

The example table is only a listing of a proposed weekly schedule for each of the three years of a typical 3-year residency program, including all that is required by ACVIM without making any specific recommendations.

Please indicate the outline of planned yearly schedule here:

	Year I	Year II	Year III
Medical Neurology *	28 weeks completed at MSU	32 to 35	32 to 34
Neurosurgery			
Neurology/Neurosurgery - Direct Supervision	28	26 to 35	26 to 34
Neurology/Neurosurgery - Indirect Supervision		(up to 6 weeks, including when a senior resident leads the service for 4 weeks in their final year). Direct and Indirect	(up to 6 weeks, including when a senior resident leads the service for 4 weeks in their final year). Direct and Indirect

		combined will be between as in Line 1 and depends on the specific number of other rotations assigned.	combined will be between as in Line 1 and depends on the specific number of other rotations assigned.
Internal Medicine	3	2	
Clinical Pathology	70 hours completed at MSU	ad hoc, read CSF with pathologists for cases (ad hoc will total at least 10 hours over 3 years)	ad hoc, read CSF with pathologists for cases (ad hoc will total at least 10 hours over 3 years)
Radiology	40 hours scheduled at MSU	ad hoc reading films/MRIs/CTs with radiologists for cases, or attending radiology resident rounds	ad hoc reading films/MRIs/CTs with radiologists for cases, or attending radiology resident rounds
Neuropathology	30 hours completed at MSU	1 hour per month, plus didactic graduate (resident) course here at CSU, supplemented by courses offered externally by ACVIM, ESVN, and the Neuroscience course	1 hour per month, plus didactic graduate (resident) course here at CSU, supplemented by courses offered externally by ACVIM, ESVN, and the Neuroscience course
Other Rotation (please list the name of each rotation):	2 weeks Anesthesia; 3 weeks Ophthalmology; 1 week Radiation Oncology; 1 week Rehabilitation; (all completed at MSU)		
Other: Surgery (Neurosurgery is performed by the Neurology Service; however, additional surgery experience in soft tissue, orthopaedic, or oncologic surgery is also assigned)		3 to 4 (either soft tissue, orthopaedic, or oncologic surgery)	3 to 4 (either soft tissue, orthopaedic, or oncologic surgery)
Other: UC Denver Med School (human neurology, neurosurgery, electrophysiology)		Up to 2	Up to 2
Research	6 weeks at MSU	8 to 11 weeks (depending on focused area of interest other weeks beyond 8 may be used for research or other electives, such as radiation therapy,	8 to 9 weeks

		oncology, anesthesia, et al)	
Independent Study	3	4 (board prep)	8 (board prep)
Vacation	2 weeks	12 days (generally taken during Research/Independent study time)	12 days (generally taken during Research/Independent study time)

Total **	52	52	52

* Many residencies are a combined neurology / neurosurgery program with no distinct separation between the services. Some programs, however, have separate training with a surgery service.

**The totals should add up to 52 weeks.

9. Describe how daily clinical case rounds are conducted and supervised:

Case rounds are conducted each morning during the week to review any updates in case status from overnight and the plans for the patient during the subsequent day. Each evening case rounds are discussed as a group in which patient history, physical and neurological examination, localization, diagnostic plan/results, and treatment plans are discussed in depth. Residents conduct topic rounds at the student level throughout each week while on clinical service, separate from case rounds. Further, residents attend rounds which are held informally as needed during the day in which greater case depth, exam findings, and pathophysiology are discussed together at the resident-level among residents and neurologists. Once monthly, in depth board-preparation level resident rounds are conducted by the neurologists on pre-determined topics throughout the course of the residency. These activities are in addition to weekly journal club.

10. The neurology specialty requires that the resident spend at least 50 hours during the residency in the following rotations: Imaging, Clinical Pathology, Neuropathology, Electrodiagnostics and Neurosurgery as well as participate in emergency duties on a rotational basis. A training hour (see CM 7.C.7) will be defined as a minimum of one (1) continuous hour of direct contact time with a supervising specialist in the other field. A Training Agreement Form must be completed and signed by the Diplomate supervising the required training, regardless of whether the training occurs on site or off-site. Please use the standardized "Training Agreement Form" found on the ACVIM website (www.ACVIM.org) to document proof of supervision for all required contact hours (imaging, clinical pathology, neuropathology, electrodiagnostices and neurosurgery) in rotations other than neurology. One Training Agreement form is required per rotation per resident at the beginning of the residency. Forms do not need to be resubmitted each year as long as a valid Training Agreement Form is on file.

In addition, please provide a brief description of how each phase of this required training is accomplished.

Imaging: 50 hours with a Board-certified radiologist interpreting images, learning and evaluating the results of special imaging techniques and attending imaging rounds or seminars.

Each neurology resident will rotate through the Radiology service for part of their 50 hours and receive instruction on image interpretation, and will participate in clinical rounds. Residents are also welcome to attend weekly Radiology resident rounds when off clinics and available. As part of the monthly Neurology Resident Rounds, several times a year neuro-imaging results from prior cases are reviewed and discussed. Residents are expected to be present during imaging of their clinic cases and to review the imaging results with the radiologists, and as such should have direct contact with board certified radiologists on 100% of their clinical cases. In addition, there is an optional didactic advanced imaging course offered at least once per 3 years, as a 2 credit 30 contact hour course.

Clinical Pathology: 50 hours with a board-certified anatomic pathologist or clinical pathologist evaluating clinical pathologic findings, attending clinicopathologic conferences, or examining surgical sections.

Each neurology resident will rotate through the Clinical Pathology service for part of their 50 hours and receive instruction on the preparation and interpretation of clinical pathology samples, as well as attend any rounds or journal clubs held during that time. Residents are expected to review the cytology from their clinic cases with the pathologists and pathology residents during the course of their clinic training.

Neuropathology: 50 hours with a board-certified anatomic pathologist devoted to review of veterinary neuropathology. This time may be spent in lecture series, seminars, or a formal training program approved by the Residency Training Committee.

A didactic course is offered by Drs. Tawfik Aboellail and Chad Frank (both DACVP), and includes lectures and practical training in the interpretation of gross and microscopic specimens. Additional pathology hours are accumulated through ACVIM offered courses at the annual Forum and ESVN Symposia, as well as the Neuroscience course.

Once monthly neuropathology (histopathology) rounds are held in conjunction with the pathology service, with participation from board-certified pathologists. During these monthly neuropathology rounds gross pathology and histopathology specimens are reviewed, and compared to clinical signs, pathophysiology, and imaging findings. Several cases are reviewed per rounds meeting. Neurology residents are expected to review the selected slides for each case prior to rounds, and interpret their findings independently. Case presentations during the rounds session rotates through the pathology and neurology residents, with Pathology and Neurology Diplomates supervising and participating in discussions. Neuropathology rounds are co-hosted by two of the ACVP pathologists on faculty (Tawfik Aboellail and Chad Frank) in conjunction with Neurology Diplomates.

Electrodiagnostics: 50 hours devoted to reviewing, evaluating, and interpreting different aspects of electrodiagnostics; including but not limited to, electroencephalography, electromyography, motor and sensory nerve conduction study and evoked potentials. Briefly state how the concepts of electrodiagnostics (including EEG) and their clinical application will be taught to residents during the training program. Specifically state whether or not the resident will have hands-on electrodiagnostic experience.

Residents are responsible for performing electrodiagnostic evaluations on their cases throughout their residency program, under the supervision of board-certified neurologists as deemed appropriate for each case based on resident experience. Residents are encouraged to observe and/or participate in any electrodiagnostic evaluation that is conducted, even if the patient is not directly their case. Routine electrodiagnostic evaluation will include complete EMG, MNCV, Rep Stim, and F waves (caseload is approximately 10-20 cases per year). In some rare cases, sensory studies may be performed, although this is not typical and involves 0-5 cases per year. BAER testing appointments are available but uncommon. BAER testing is performed approximately 5-10 times per year (when performed it is often including litters of several puppies). Clinical BAER tests are supplmented with banked results and theoretical discussions of these results. If this is insufficient we can contact local breed clubs and make arrangements to generate cases to ensure adequate training opportunity. EEG is typically performed in some seizure cases for teaching purposes, or for clinical differentiation of seizure vs. dysphoria, or for evaluation of obtunded/coma cases. Approximate caseload is at least 5-10 cases per year, and could be increased if needed due to the strong emergency and critical care department here at CSU.

A graduate (resident) Independent Study course in Electrophysiology is offered every 3 years, and covers theoretical principles (e.g., volume conduction, etc) as well as clinical (case-based) topics. This is advanced and designed to prepare residents to interpret and thoroughly understand their clinical electrophysiology results, as well as provide information for board-preparation.

Additionally, for each clinical case, printouts of electrodiagnostic results from each case are copied for each resident to review and analyze according to the principles presented in Dr. Cuddon's electrodiagnostic manual.

Monthly resident rounds rotate through topics, including periodic discussions at the board-preparation level of electrodiagnostic evaluation, wave form derivations, and electrophysiology. This can be supplemented by courses sponsored at ACVIM Resident reviews, as well as the Neuroscience course.

In the past, we have conducted a 2-day lecture/laboratory workshop on electrophysiology hosted by Colette Williams. This includes lectures and laboratories. When funding permits, we plan to continue this workshop for each set of residents (i.e., conduct the workshop every 3 years). On site, Dr. Ray Whalen (PhD neuroscientist, neuroanatomist and electrophysiologist) provides rounds on these topics when requested, and assists with most of the clinical electrophysiologic studies when available to enhance the level of depth to the discussion of results.

Neurosurgery: 50 hours participating in veterinary neurosurgical procedures. Please provide a specific description of the type of participation [i.e. observation, performance of neurosurgery], and credentials of those providing the training [i.e. ACVS vs. ACVIM Neurology/ECVN]. A Training Agreement Form must be completed if this training is provided by individuals other than the ACVIM (Neurology) or ECVN supervising Diplomate for the residency training program.

For general surgery experience, the resident will spend at least 3 weeks per year on Surgery services, among Soft Tissue Surgery, Orthopaedic Surgery, or Oncological Surgery, working directly with ACVS or ECVS diplomates during the course of their residency (exceptions may be made for residents that have already achieved board-certified by ACVS or ECVS). Neurosurgical procedures are typically performed by the neurology section under the supervision of ACVIM diplomates. Approximately 150 surgical cases are operated on per year on the Neurology service. The current range (though not an exclusive list) of surgeries that we have performed or are capable of performing at CSU includes:

Hemilaminectomies
Ventral slots
LS Dorsal laminectomies
Cerval laminectomies/hemilaminectomies
Vertebral stabilizations (e.g., Wobbler)
Cervical disc arthroplasty (Adamo disc)
Craniotomies (various approaches, including neuronavigation-guided)
Brain biopsies (needle)
Spinal fractures
AA subluxations
Other (spinal tumors, arachnoid diverticula, etc)
Muscle and nerve biopsies are performed on approximately 5-10 cases per year on average.

Neurosurgical training will begin with observation/assisting, and gradually move to performance as primary surgeon, with supervision and assistance from the ACVIM/ACVS/ECVS diplomate as appropriate for each case depending on the experience of the resident.

Rebecca Packer received training in neurosurgery at the University of Georgia under John Oliver DACVIM (verbal discussions), Marc Kent DACVIM, Stephen Budsberg ACVS, Jonathan Chambers ACVS, Denny Aron ACVS, Joan Coates ACVIM, Joe Kornegay ACVIM, Jimi Cook ACVS, James Tomlinson ACVS, Derek Fox ACVS, and Eric Pope ACVS. The neurosurgical caseload at the University of Georgia and the University of Missouri was approximately 40-50% of the total neurology cases seen through the Neurology Service. Additional training was acquired through formal neurosurgical courses and observation at human neurosurgery hospitals.

Stephanie McGrath received training in neurosurgery at Colorado State University under the supervision of Drs. Lisa Klopp (DACVIM), Paul Cuddon (DACVIM), with additional training from the DACVS surgeons at Colorado State University. Additional post-graduate training was acquired by formal neurosurgical courses, and also supplemented by training from Rebecca Packer (DACVIM) for additional intracranial surgical skills.

Lisa Bartner received training in neurosurgery from Colorado State University under the supervision of Drs. Rebecca Packer (DACVIM) and Stephanie McGrath (DACVIM), with additional training from the DACVS-boarded surgeons.

Additional surgical supervision of current CSU neurology residents may occur from the DACVS and DECVS surgeons here when on Orthopaedic, Oncologic, or Soft Tissue surgery rotations.

Emergency Duty: Participation in emergency service on a rotational basis; cases seen may be limited to neurology. Please provide a specific description of the type of participation.

Neurology residents provide on-call backup service for the Urgent Care (ER) service at Colorado State University VTH throughout the year. Their responsibilities are limited to neurological problems. The residents develop their own schedule and evenly divide the on call responsibilities among themselves. The faculty neurologists provide on-call backup to the residents, and are available for consultation at any time. Whenever the Urgent Care clinicians feel the need for consultation or backup advice, they call the resident on duty, and then the resident in turn calls their faculty backup as needed. Faculty make it clear that residents are to be available for in person or phone assistance for any case in which the ER clinicians want support, and

the faculty neurologists are always very willing to provide in person or phone assistance to the neurology residents as needed and appropriate. The amount of support provided by the neurology faculty naturally diminishes throughout the program as the residents become more comfortable with case diagnosis and management, but faculty are always available.

11. The neurology specialty requires that the resident spend a minimum of 80 hours involved in routine and regular participation in a critical review of the literature (e.g. journal club) during the residency training program with at least one board-certified neurologist in attendance at each journal club meeting. Please explain how this requirement is met:

Neurology journal club is held twice monthly, on a regular basis, and one or more Neurology Diplomates are always in attendance. In addition we hold once monthly resident rounds, and once monthly neuropathology rounds, also with one or more Neurology Diplomates always in attendance.

12. The neurology specialty requires that the advisor meet with the resident at 6 month intervals to assess, review and critique the resident's progress and weekly schedule of activities. The advisor must provide written documentation of the review that will be signed by both advisor and resident. Please explain how this is accomplished:

Reviews are conducted with each resident individually every 6 months (typically January and July). Case logs are required internally here at CSU, and case logs and weekly schedules are analyzed at each review to ensure a broad exposure to a variety of cases, as well as ensure adequate numbers of cases. The residents are also asked to provide a self-evaluation of strengths and weaknesses during this time, and provide feedback and an assessment of the program features (e.g., areas where they feel the program and/or mentorship could be improved to help them improve skills). The faculty also present their assessments of each resident on the written form supplied by the Department. This evaluation form includes evaluation of specific items that pertain to collegiality, professionalism, clinical competence, teaching effectiveness, and research productivity. Together the resident and faculty members set goals and areas of improvement for the next 6 months. Where required residents are given more specific itemized goals and deadlines to keep them on track for knowledge and skills pertinent to their stage of training within the program.

13. The neurology specialty requires that the resident must complete a basic science or clinical research project that follows the scientific method approach and receives approval by the resident advisor (review CM section 7.E.5.c). Please describe how you plan for the resident to undertake, monitor, and complete a project. Include a timeline that the resident and mentor will use as a guide for completion of the project. Note that publication of this research project is not a requirement.

Each resident is expected to choose a research project in the first year of their program. Initially, discussions are held to determine the resident's area of interest within neurology. Where applicable, residents may submit grant proposals for their project of interest; however, at times their interest cannot be perfectly accommodated due to lack of funding or other logistical limitations, and a project within the field of interest of mentors or other faculty are selected.

Once a topic is selected, the resident is expected to write a formal summary of the research question, literature search, and methodology/project design, and budget. This is reviewed with the project advisor and mentor. Once the project design is finalized, the resident must develop a written timeline for performing the various stages of the project, including the timeline for anticipated manuscript preparation and submission. This timeline is based on their off clinics/research time as scheduled throughout the program. Residents who fail to complete their research project will not receive their residency certificate until such time as the project (or equivalent research experience) is completed and documented. Publication of the project itself is not required, as some projects may not result in publishable data, but two written manuscripts are required internally, with the hope/intent of submission and publication of the research project.

Timeline: 1) establish research topic in first semester of program, 2) submit necessary grant proposals, IACUC or university paperwork, and begin data collection by second semester of program, 3) finish data collection and begin data analysis in second year of program, 4) begin writing up research project report and manuscript. If opportunities are availlable, present abstract at the college-wide Research Day or ACVIM in third year of residency.

14. Please indicate the availability of the following facilities or equipment. Indicate if these are available at the primary training site, or at a different location. (In the Location column, indicate on-site for primary location or the name of the facility where the equipment is located if off-site.) For facilities that are not on-site, please describe the situation and availability in the space at the end of this section. Please also provide the manufacturer and model of the unit for electrodiagnostic and imaging equipment.

	Available? Yes	Available? No	Location of equipment? (On-site or list site name)
a) Standard radiological equipment	☒	☐	On site
b) Ultrasonographic equipment	☒	☐	On site
c) Clinical Pathology capabilities: (includes CBC, serum chemistries, blood gases, urinalysis, cytology, parasitology, microbiology, and endocrinology)	☒	☐	On site
d) Electrocardiography	☒	☐	On site
e) Blood Pressure Measurement	☒	☐	On site
f) Radiation Therapy Facility	☒	☐	On site
g) Veterinary Library w/Literature Searching Capabilities	☒	☐	On site, and through inter-library loan and in Denver at the University of Colorado
h) Computerized Medical Records w/Searching Capabilities	☒	☐	On site
i) Medical Library w/Literature Searching Capabilities	☒	☐	On site
j) Electromyography and nerve conduction study testing	☒	☐	On site
k) Evoked Response Equipment	☒	☐	On site
l) Electroencephalography	☒	☐	On site
m) Computed Tomography	☒	☐	On site (CT/ PET scanner)
n) Magnetic Resonance Imaging (include field strength)	☒	☐	1.5T GE with newly upgraded hardware, coils, and capability to do advanced sequences, including DTI and fiber tractography.

If any of the above equipment or facilities is available off-site, please explain how the resident can access them for case management, research, or study, *especially with respect to the use of imaging and electrodiagnostic equipment:*

N/A (All facilities listed above are on site; medical library can be accessed via inter-library loan of materials, or by driving 1 hour to Denver to access the medical school library directly on site).

15. Residents must attend formal teaching conferences, resident seminars, grand rounds sessions, medicine journal clubs, neurobiology classes, etc. Residents must participate in these activities an average of four times per month, regardless of their duty status. Please describe the formal conferences, such as clinicopathologic conferences, journal clubs, or seminars that are held on a regular basis.

*Neurology Journal Club - Held twice per month. Focus is on those journal articles relevant to clinical neurology and board preparation. Discussion will include content/theory presented in the paper, as well as methods of critically reviewing scientific articles. The first journal club meeting for new residents will be a tutorial on critical review of articles and the various types of study design.

*Neurology Resident Rounds – Held monthly. Focus is on case based or topic based review in preparation for board exams, including Neuroanatomy, Neuroradiology, Neuropathology, Neurophysiology, Clinical Neurology/Case management, and Theory.

*Neuropathology Rounds – Held monthly. This is a joint effort between the Neurology service, the Clinical pathology service, and the Anatomic pathology service at CSU. Includes evaluation/review of cytology and histopathology slides from neurological hospital cases, and topic discussion of those cases (see more detailed description in Neuropathology section above).

*House Officer Grand Rounds/Seminar – Held weekly, required attendance for at least 3 semesters. All house officers are

required to present one seminar each year of their program.

*(Indicates mandatory attendance)

16. The resident must give a presentation at a formal conference at least once per year. This may include lectures in departmental courses for veterinary students, grand rounds presentations, presentation of papers or seminars at conferences, or participation in continuing education programs. Documentation of these presentations must be included in the neurology credentials packet of the resident.

Each resident is required to give at least two formal seminars within their residency program, as part of their resident seminar course. This is attended by students, graduate students and/or house officers, and faculty. Additional seminars (or poster/oral abstracts) are either given at the CSU CVMBS Research Day, ACVIM, or the Neuroscience Course (Brain Camp). Presentation of scientific abstracts at ACVIM or other national meetings is strongly encouraged within the program. Participation in student didactic lectures is not routinely done; however, this can be arranged for those residents with a particular interest in academic pursuits. Residents do lead the majority of student topic-round discussions on the clinical rotation.

The Academy for Teaching and Learning at CSU is a resourse to help all faculty and residents with teaching strategies, training, and provide constructive feedback and instruction. Recently, a resident-specific teaching program has been developed (in progress) and is being incorporated into the residency program to additionally help teach residents how to teach effectively, in various settings (e.g., daily clinical cases, topic rounds, didactic lectures).

17. A Neurology Residency Training Program must provide at least 40 hours per year of intensive formal review sessions for residents on topics covered in the General and Specialty Examinations. The requirement could be met in part by attending an ACVIM Advanced Continuing Education (ACE) course, the ACVIM Neuroscience Course (Brain Camp) or an ACVIM Forum. Please describe how these opportunities will be made available to the resident.

All residents are required to participate in weekly rounds, which include journal club, neuropathology rounds, and resident rounds. Residents are also required to participate in cadaver lab (mentored by a Neurology diplomate in attendance) once monthly for 3-4 hours (36 to 48 hours per year). Residents are encouraged to attend the Neuroscience Course and ACVIM meetings. In addition, the residents are encouraged to take the Post-Graduate Medicine course for the first two years of their program (4 semesters) at 3 hours per week during the semester (80-86 hours per year for Year 1 and Year 2). Residents also are required to take courses in Biostatistics, Neuropathology, and Electrophysiology courses. These courses are on a rotational basis every 3 years, so contact hours may be much greater in some years than others. However, given all of these opportunities for board-preparation, coursework, and rounds, residents will get well over 40 hours every year.

18. How many major veterinary medical or medical meetings are each resident able to or expected to attend during his/her training program?

None	One	Two	> Two
☐	☐	☒	☐

Comments: Unless exempted for extenuating circumstances (e.g., financial constraints), residents are expected to attend the Neuroscience Course (aka Brain Camp) during their residency, as well as the ACVIM Forum during Year 2 of their program, as a minimum. Where scheduling and finances permit, the ECVN symposium could be substituted for ACVIM. Residents are encouraged to attend other conferences in their area of interest, and as the schedule allows (e.g., SWAN, SEVEN, ECVN, ASIF, Neuropathology Courses, other).

19. Are one or more publications required as part of the training program?

Yes	No	Number
☒	☐	2

Comments: The publications may be case reports or original research from the residency project. If the research project did not result in publishable data, then publication of a case report or review article (or equivalent) is sufficient to fulfill this requirement. The manuscript does not need to be accepted prior to completion of the residency, but should be submitted. CSU graduate requirements provide a proposed timeline for the first publication to be submitted prior to the end of Year 2, and the second publication to

be submitted prior to the end of Year 3.

20. Please describe any additional pertinent information that the Residency Training Program should consider in its evaluation of this Training Program.

None specifically. CSU has a very strong program with faculty in Surgery, Critical Care, Oncology, Radiation Oncology, Radiology, Sports Medicine and Rehabilitation, including others, and as such creates a diverse and collaborative environment in which to train residents. The graduate program and design of the residency program facilitate a strong knowledge base, critical-thinking ability, and preparation for board exams, as well as solid preparation for becoming a specialist neurologist. There is strong mentorship and support available to residents, and opportunities for independence as appropriate. The facilities available (imaging, surgical instrumentation, radiation therapy modalities) are among the most advanced available, and provide a good basis for exposure and training.

Please note: The Program Director must report substantive changes within a Neurology RTP affecting compliance with Specialty of Neurology requirements to the Neurology RTC Chair within 14 days. This must be done in writing through the ACVIM office before the changes are made to ensure they are acceptable to the Neurology RTC.

Significant changes could include, but are not limited to:

- transferring from one program to another
- alterations in program duration
- switching to a 'dual board' program
- enrolling in an institutional graduate program
- change of Program Director or Resident Advisor

☒ I verify that the above information is an accurate reflection of this Residency Training Program.

Per the Certification Manual, each year, the Program Director (PD) must certify to the RTC/ RTCC and ACVIM, in writing, that they have read the ACVIM Certification Manual and understands their role in residency training.

☒ Checking this box is an indication I have read the ACVIM Certification Manual and understand my role in the Residency Training Program.