



RESIDENCY TRAINING PROGRAM REGISTRATION  
2018-2019  
NEUROLOGY

Part One

New applications for ACVIM Residency Training Programs must be received by the Residency Training Committee 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 most current version of the CM is available on the ACVIM website at [www.ACVIM.org](http://www.ACVIM.org). If there is a discrepancy between this form and the CM, the CM will be considered correct, however, please contact the ACVIM office or the Residency Training Committee Chairperson for clarification.

Prior to making significant changes in a Residency Training Program, approval of the ACVIM and Neurology Residency Training Committee must be obtained. The Candidate and/or Program Director must notify ACVIM, in writing. Significant changes could include, but are not limited to: 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:** This form contains questions for three separate purposes; data collection that ACVIM must maintain for its accreditation as a specialty college; data collection for each specialty to evaluate what is appropriate for residency programs; and data collection to evaluate this Residency Training Program for renewal. It is important that all questions be answered accurately and completely, even if the answer to a specific question is not essential for a program's renewal.

**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, are listed in Part Two.

Program Director Name :

(Must be a Diplomate of ACVIM in the Specialty of Neurology or an approved Diplomate of the European College of Veterinary Neurology)

Program Director's Contact Information:

Work Phone:	<input type="text" value="(970) 297-5000"/>
E-mail:	<input type="text" value="rebecca.packer@colostate.edu"/>
Mailing Address:	<input type="text" value="1678 Campus Delivery"/>
	<input type="text" value="Colorado State University"/>
	<input type="text" value="Ft. Collins, CO 80523-1678"/>

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

Primary Site and Length of Program:

Multi-site programs, if any, are listed in Part Two.

2. Resident Advisor(s): Must be a Diplomate of ACVIM in the Specialty of Neurology or a Diplomate of ECVN.

[Rebecca Packer](#)  
[Stephanie McGrath](#)

3. Supervising Diplomates in Neurology: Must be a Diplomate of ACVIM in the Specialty of Neurology or a Diplomate of ECVN.

[Rebecca Packer - Neurology](#)  
[Stephanie McGrath - Neurology](#)  
[Lisa Bartner - Neurology](#)

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

[Robert Callan - LAIM](#)  
[Franklyn Garry - LAIM](#)  
[Josie Traub-Dargatz - LAIM](#)  
[David Van Metre - LAIM](#)  
[Gabriele Landolt - LAIM](#)  
[Yvette Nout-Lomas - LAIM](#)  
[Stacey Byers - LAIM](#)  
[Katharine Simpson - LAIM](#)  
[Elsbeth Swain - LAIM](#)  
[Barbara Biller - Oncology](#)  
[Susan Lana - Oncology](#)  
[Rodney Page - Oncology](#)  
[Stephen Withrow - Oncology](#)  
[Douglas Thamm - Oncology](#)  
[Kristen Weishaar - Oncology](#)  
[Steve Dow - SAIM](#)  
[Michael Lappin - SAIM](#)  
[Rod Rosychuk - SAIM](#)  
[David Twedt - SAIM](#)  
[Lisa Brownlee - SAIM](#)  
[Kristy Dowers - SAIM](#)  
[Julia Veir - SAIM](#)  
[Craig Webb - SAIM](#)  
[Sara Shropshire - 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, Dates of Program, (Resident Advisor)
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<a href="#">Amy Stark 7.15.2017-7.15.2020 (Stephanie McGrath)</a> <a href="#">Aslynn Jones 7.15.2016 - 7.14.2019 (Rebecca Packer)</a>
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**Please note, any Program Director or Candidate that significantly changes or alters their Residency Training Program before completion 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:**

- **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**



RESIDENCY TRAINING PROGRAM REGISTRATION
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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: 7 Feb 2018

Program Director Name: Rebecca A Packer, MS, DVM, DACVIM (Neurology)

(Must be a Diplomate of ACVIM in the Specialty of Neurology or an approved Diplomate of the European College of Veterinary Neurology)

Name of Sponsoring Institution (Residency Training Program): Colorado State University

1. For multi-site residency programs: To ensure uniformity of training and compliance with current Certification Manual (CM) requirements, training programs that include multiple sites must provide detailed information regarding supervision and facilities available at each specific site(s).

Secondary Site/Outside Rotations (if applicable):

(Please include the following for each site: Supervising Diplomate (ACVIM or other specialty), amount of time scheduled at the site and training requirements to be met.

N/A

2. Length of Training Program:

Yes
2 years
3 years
Other -provide details

3. 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 provide information and training both clinically and for board-preparation. Successful applicants who have already obtained an MS or PhD degree may have this requirement waived in some cases after petitioning the department head and graduate committee. A PhD degree is offered and optional, but may add additional time to the training program (3 year residency plus additional time to complete the PhD). 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. The didactic coursework for the residents (aka, graduate students) is designed to prepare them for board examinations as well as to be well-rounded specialist clinicians. Courses include (but are not limited to) biostatistics, LA/SA comparative neurology and neurosurgery, neuropathology, advanced imaging, radiation therapy, small animal internal medicine specialties (including diseases, pathophysiology, therapies), physiology, electrophysiology, and others.

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

Name of Diplomat(e)s	Comments
See list in Part One for on-site. No additional off-site supervision (N/A).	

5. 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 Diplomat(e)s	Clinical or Gross	Comments
Andrea Bohn, DVM, PhD, DACVP Paul Avery, VMD, PhD, DACVP Christine Olver, DVM, PhD, DACVP Glade Weiser, DVM, DACVP Linda Vap, DVM, DACVP Randall Basaraba DVM, PhD, DACVP Gregg Dean, DVM, PhD, DACVP Gary Mason, DVM, PhD, DACVP	Clinical Clinical Clinical Clinical Clinical Clinical Clinical Clinical	All on site
Tawfik Aboellail, BVSc, PhD, DACVP Patricia Cole, DVM, PhD, DACVP Colleen Duncan, DVM, PhD, DACVP, DACVPM EJ Ehrhart, DVM, PhD, DACVP Chad Frank, DVM, MS, DACVP Sushan Han, DVM, PhD, DACVP Terry Spraker, DVM, PhD, DACVP Barb Powers, DVM, PhD, DACVP	Anatomic Anatomic Anatomic Anatomic Anatomic Anatomic Anatomic Anatomic	

6. 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 Diplomat(e)s	Comments

Angela Marolf, DVM, DACVR Richard Park, DVM, PhD, DACVR Elissa Randall, DVM, MS, DACVR Myra Barrett, DVM, MS, DACVR Sean Adams, DVM, DACVR Linda Lang, DVM, DACVR Kelly Mann, DVM, PhD, DACVR Alejandro Valdes-Martinez, DVM, DACVR Lynn Griffin, DVM, DACVR (Radiation Oncology and Diagnostic Imaging) Susan Kraft, DVM, PhD, DACVR (Radiation Oncology and Diagnostic Imaging) Susan LaRue, DVM, PhD, DACVS, DACVR (Radiation Oncology) Keara Boss, DVM, PhD, DACVR (Radiation Oncology)	All on site
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7. 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	Comments
Stephen Withrow, DVM, DACVS, DACVIM (Oncology) Nicole Ehrhart, VMD, DACVS Deanna Worley, DVM, DACVS Bernard Séguin, DVM, MS, DACVS	Oncologic Surgery Oncologic Surgery Oncologic Surgery Oncologic Surgery	
Howard Seim, DVM, DACVS Eric Monnet, DVM, PhD, DACVS, DECVS Catriona MacPhail, DVM, PhD, DACVS Dan Smeak, DVM, DACVS Sarah Marvel, DVM, DACVS	Soft Tissue/Neurosurgery Soft Tissue/Neurosurgery Soft Tissue/Neurosurgery Soft Tissue/Neurosurgery Soft Tissue/Neurosurgery	
Felix Duerr, DVM, MS, DACVS, DECVS, DACVSMR Ross Palmer, DVM, MS, DACVS Clara Goh, BVSc, MS, DACVS Nicolaas Lambrechts, BVSc, MMedVet, DECVS, DACVSMR	Orthopaedic Surgery/SportsMedReh Orthopaedic Surgery Orthopaedic Surgery Orthopaedic Surgery/SportsMedReh	
Christopher Orton, DVM, PhD, DACVS	Cardiovascular Surgery	
Cynthia Powell, DVM, MS, DACVO Kathryn Wotman, DVM, DACVO	Ophthalmology Ophthalmology	
Timothy Hackett, DVM, MS, DACVECC Lauren Sullivan, DVM, MS, DACVECC Geoff Heffner, DVM, DAVECC Eileen Hackett, DVM, MS, DACVS(LA), DACVECC Diana Hassel, DVM, PhD, DACVS(LA), DACVECC	Critical Care Critical Care Critical Care Critical Care (Large Animal) Critical Care (Large Animal)	
Rodney Rosychuk, DVM, MS, DACVIM (SAIM) Jennifer Pendergraft, DVM, MS, DACVD	Dermatology Dermatology	
Khursheed Mama, DVM, DACVA Pedro Boscan, DVM, PhD, DACVA Peter Hellyer, DVM, MS, DACVA Marlis Rezende, DVM, PhD, DACVA	Anesthesia Anesthesia Anesthesia Anesthesia	
Colleen Duncan, DVM, PhD, DACVP, DACVPM	Epidemiology	

Patrick McCue, DVM, PhD, DACT Ryan Ferris, DVM, MS, DACT Robert Mortimer, DVM, MS, DACT	Theriogenology Theriogenology Theriogenology	
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8. Please list the residents who have completed the training program within the last five years, including the year that each individual's training program ended and whether the individual has completed the Board certification process.

Name(s)	Program End Date (mm/dd/yyyy)	Diplomate? (Yes or No)
Lisa Bartner Yenlie Zingale	07/15/2017 07/15/2016	Yes Not yet (2 <sup>nd</sup> attempt at remaining sections of the certifying exam will occur in June 2018)

9. Please list the 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(s) (first/last)	Length of Program (in years)	Program Start Date (mm/dd/yyyy)	Program End Date (mm/dd/yyyy)	Resident Advisor Name(s)
Amy Stark Aslynn Jones	3 years 3 years	07/15/2017 07/15/2016	07/15/2020 07/15/2019	Stephanie McGrath Rebecca Packer

**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.

10. 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	<input checked="" type="checkbox"/>
Non-traditional	<input type="checkbox"/>

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.

N/A

11. 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:**

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

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:

	<b>Year I</b>	<b>Year II</b>	<b>Year III</b>
<b>Medical Neurology *</b>	32 to 38	32 to 35	32 to 34
<b>Neurosurgery</b>			
<b>Neurology/Neurosurgery - Direct Supervision</b>	26 to 38 direct	26 to 35 direct	26 to 34 direct
<b>Neurology/Neurosurgery - Indirect Supervision</b>	(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	(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	(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.	rotations assigned.	rotations assigned.
<b>Internal Medicine</b>	2 to 4	2	
<b>Clinical Pathology</b>	1 to 1.5 weeks, plus 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)	ad hoc, read CSF with pathologists for cases (ad hoc will total at least 10 hours over 3 years)
<b>Radiology</b>	1 to 1.5 weeks, plus ad hoc reading films/MRIs/CTs with radiologists for cases	ad hoc reading films/MRIs/CTs with radiologists for cases	ad hoc reading films/MRIs/CTs with radiologists for cases
<b>Neuropathology</b>	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	1 hour per month, plus didactic graduate (resident) course here at CSU, supplemented by courses offered externally by ACVIM, ESVN, and the Neuroscience course
<b>Other Rotation (please list the name of each rotation):</b>			
<b>Other:</b> Surgery (Neurosurgery is performed by the Neurology Service; however, additional surgery experience in soft tissue, orthopaedic, or oncologic surgery is also assigned)	3 to 6 (either soft tissue, orthopaedic, or oncologic surgery)	3 to 4 (either soft tissue, orthopaedic, or oncologic surgery)	3 to 4 (either soft tissue, orthopaedic, or oncologic surgery)
<b>Other:</b> UC Denver Med School (human neurology, neurosurgery)		Up to 2	Up to 2
<b>Research</b>	7	8	8
<b>Independent Study</b>	(combined with research)	4 (board prep)	8 (board prep)
<b>Vacation</b>	12 days (generally taken during Research or Independent study time)	12 days (generally taken during Research or Independent study time)	12 days (generally taken during Research or Independent study time)
<b>Total *</b>	52	52	52

\*The totals should add up to 52 weeks.

12. 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.

13. The neurology specialty requires that the resident spend at least 50 hours during the residency in the following rotations: Radiology, Clinical Pathology, Neuropathology and Neurosurgery. 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](http://www.ACVIM.org)) to document proof of supervision for all required contact hours (clinical pathology, radiology, neuropathology surgery, etc.) in rotations other than neurology.** 1 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.

Radiology: 50 hours with a Board-certified radiologist interpreting radiographs, attending seminars and participating in and evaluating the results of special radiographic procedures.

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. 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 pathologist or clinical pathologist evaluating clinical pathologic findings, attending clinicopathologic conferences, and 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 devoted to review of veterinary neuropathology. This time may be spent in lecture series, seminars, or a formal training program recognized and approved by the college.

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 the first year of the residency program the histopathologic review will be presented by the pathologists or pathology residents to the remainder of the group. During the final

two years of the residency program, the neurology resident participates in interpreting the pathology slides independently, and works with the pathologist to verify their interpretation. Neuropathology rounds are co-hosted by two of the ACVP pathologists on faculty (Tawfik Aboellail and Chad Frank) in conjunction with Neurology. During these monthly neuropathology rounds gross pathology and histopathology specimens are reviewed, and compared to clinical signs, pathophysiology, and imaging findings.

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]. 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 4 weeks per year on Surgery services, including Soft Tissue Surgery, Orthopaedic Surgery, and 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 1500 cases are admitted to the neurology service per year. Approximately 25-30% of these cases are surgical cases. 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

Cervical 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 (Engel) 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.

14. The neurology specialty requires that the resident be able to perform and interpret current electrodiagnostic procedures. 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 electrodiagnostics 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 supplemented 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) 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.

15. The college 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. Please explain how this requirement is met:

Critical review of scientific literature is done weekly during Neurology Journal club, with residents presenting and faculty present to facilitate the discussion and ask questions as needed. When residents are on other rotations they attend other services journal clubs.

16. 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. 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 are analyzed at each review to ensure a broad exposure to a variety of cases, as well as ensure adequate numbers of cases. Additionally, feedback is given as well as received as to the performance of the resident, as well as setting goals and areas of improvement for the next 6 months. The residents

are also asked to provide a self-evaluation 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). Where required residents are given specific goals and deadlines to keep them on track for knowledge and skills pertinent to their stage of training within the program.

17. The neurology specialty requires that the resident complete a significant research or clinical investigative project. 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; however, at times their interest cannot be perfectly accommodated 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. If the research project is not publishable, then other publications must be performed (e.g., case report, etc) in place of this.

Timeline: 1) establish research topic in first semester of program, 2) submit necessary 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, submit first manuscript (not necessarily on research), 4) begin writing up research project report and second manuscript. If opportunities are available, present abstract at the college-wide Research Day or ACVIM in third year of residency.

18. 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?		Location of equipment?
	Yes	No	(On-site or list site name)
a) Standard radiological equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
b) Ultrasonographic equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
c) Clinical Pathology capabilities: (includes CBC, serum chemistries, blood gases, urinalysis, cytology, parasitology, microbiology, and endocrinology)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
d) Electrocardiography	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
e) Blood Pressure Measurement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
f) Radiation Therapy Facility	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
g) Veterinary Library w/Literature Searching Capabilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site, and through inter-library loan and in Denver at the University of Colorado

- h) Computerized Medical Records w/Searching Capabilities
- i) Medical Library w/Literature Searching Capabilities
- j) Electromyography and nerve conduction velocity testing
- k) Evoked Response Equipment
- l) Electroencephalography
- m) Computed Tomography
- n) Magnetic Resonance Imaging (include field strength)

<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site
<input checked="" type="checkbox"/>	<input type="checkbox"/>	On site (CT/ PET scanner)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	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 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).

19. Describe the formal conferences, such as clinicopathologic conferences, journal clubs, or seminars that are held on a regular basis. Please provide a description and the typical schedule for these:

\*Neurology Journal Club – Held weekly unless residents are on an out-rotation and attending a different service journal club. 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 unless residents are on an out-rotation and attending other service activities. 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, or book club reviews of books pertinent to neurology board exams.

\*Neuropathology Rounds – Held monthly as a joint effort between the Neurology service, the Clinical pathology service, and the Anatomic pathology service at CSU. Required even when residents are on out-rotations. Includes evaluation/review of cytology and histopathology slides from neurological hospital cases, and topic discussion of those cases.

\*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)

20. Detail the teaching responsibilities expected of the resident during the training program. 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.

Residents are responsible for leading student topic rounds after their first year. All residents are required to assist with DVM laboratories pertaining to surgery and neurology where requested by the department or faculty. Additional participation in didactic lectures is not typical, but is occasionally arranged for those residents that desire more experience in preparation for a career in academia. Each resident is required to give at least two formal

seminars within their residency program. This is attended by students, graduate students and/or house officers, and faculty. Additional seminars (or poster/oral abstracts) are often given at the CSU CVMBS Research Day. Presentation of scientific abstracts at ACVIM or other national meetings is strongly encouraged.

The Academy for Teaching and Learning at CSU is a resource 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).

21. 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
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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, ECVN, ASIF, Neuropathology Courses, other).

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

Yes	No	Number
<input checked="" type="checkbox"/>	<input type="checkbox"/>	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 for review. CSU graduate requirements expect 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.

23. 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, any Program Director or Candidate that significantly changes or alters this Residency Training Program before completion 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:



- 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.**