Revised 08/2016

AMERICAN COLLEGE OF VETERINARY RADIOLOGY
RECOGNIZED VETERINARY SPECIALTY OF RADIATION ONCOLOGY (ACVR-RO)

RESIDENCY TRAINING PROGRAM APPLICATION

NOTE: Some questions in this form are included for data collection purposes. The inclusion of an item does not necessarily imply that the item is a program requirement for ACVR-RO residency program. Please refer to the current Radiation Oncology Training Program Guidelines for comprehensive residency training requirements. This document may be downloaded from acvr.org, Members Only, Downloads.

APPLICATION INSTRUCTIONS:

Training program directors wishing to have their programs evaluated should electronically submit this form to the chair of the Radiation Oncology Residency Standards and Evaluation Committee (RSEC) and carbon copy the Executive Director of the ACVR (contact information is available at acvr.org, Members Only, Administration). The application must be received at least 90 days before the meeting of Executive Council at which the program will be evaluated. There are two meetings of Executive Council each year; a midyear meeting in April, and the Annual Meeting held in conjunction with the Annual meeting of the ACVR. Exact dates of Executive Council meetings are available at acvr.org, Calendars and important dates are also printed in each issue of Veterinary Radiology & Ultrasound. There will be no exceptions to the 90 day lead time requirement. The Residency Standards and Evaluation Committee will evaluate the application, a vote will be taken, and the results of the vote and the majority recommendation of the committee forwarded to the President of the Recognized Specialty of Radiation Oncology for consideration at Executive Council at one of the two annual meetings.

For the required ACVR and ACVIM Diplomates providing consultation in medical oncology and imaging, please provide a brief 2-page curriculum vitae and specify the number of weeks each year that the individual will be available to actively support the radiation oncology trainee.

ACVR-RO RESIDENCY TRAINING PROGRAM APPLICATION

1. Date of Application

01/30/2017

2. a. Program Director(s): (Must be a Diplomate of ACVR Recognized Veterinary Specialty of Radiation Oncology)

Charles A. Maitz, DVM, PhD, DACVR-RO

Number of weeks per year faculty member is available to resident on a daily basis.

48

Program Director's Contact Information:

Work Phone:	(573) 882-7821
Fax:	(573) 884-5444
E-mail:	maitzc@missouri.edu

b. Additional Radiation Oncologists in support of the program (Diplomate of ACVR Recognized Veterinary Specialty of Radiation Oncology)

Jimmy C. Lattimer, DVM, MS, DACVR (Diagnostic and RO) Tara J. Ehling, DVM, DACVR-RO

Number of weeks per year faculty member(s) is/are available to resident on a daily basis. Please list for each faculty member.

52 total Maitz – 50% clinical duty Lattimer – 50 % clinical duty. Dr. Lattimer covers radiation oncology and diagnostic radiology simultaneously Dr. Ehling is the radiation oncologist at our Wentzville facility (80 miles away in St. Louis). She is available by phone and email, and attends weekly rounds.

Faculty member on site?

Yes	No
X	

3. a. Application is made for check one (see below):

Standard Program	Alternative Program
X	

The following conditions define an Alternative Program:

- If the program is not at least a minimum two-year continuous radiation oncology training program which fulfills all the trainee requirements of the training program guidelines, it will be defined as an Alternative Program.
- If exemption from any other requirement for a Standard program is requested in the application, the program must be submitted as an Alternative Program.

4. Location of Primary Institution

Primary Site:
University of Missouri

Department
Veterinary Medicine and Surgery

Hospital/University
Veterinary Health Center

Address
900 East Campus Dr., Columbia, MO, 65211

5. Cooperating Institution(s) (If applicable):

Department

Hospital/University

Address

For cooperating institutions, attach **current letters of agreement signed on behalf of the institution(s) by appropriate individual(s).

6. Length of Training Program (months):

36

If greater than 2 years, will this period include 24 months of continuous training in radiation oncology?

yes

7. Number of months dedicated solely to radiation oncology training (excluding time on Medical Oncology service, Radiology/Imaging, etc.)

23

8. Advanced Degree:

	Yes	No	Optional
Masters:	X		
PhD:			X

9. Essential Program Faculty:
*If dual-boarded, individual faculty member may serve in only one capacity
*Please list all qualified faculty in support of program

a. Diagnostic Radiologist(s): (Must be Diplomate(s) of the ACVR or ECVDI)

Jodi Matheson, DVM, DACVR (radiology)

Number of weeks per year faculty member(s) is/are available to resident on a daily basis. Please list for each faculty member.

52 total (48 weeks clinical coverage, each)

Faculty member on site?

Yes	No
X	

If off site, please explain relationship.

b. Medical Oncologist(s): (must be Diplomate(s) of ACVIM, Specialty of Oncology)

Carolyn J. Henry, DVM, MS, DACVIM (oncology) Jeffrey N. Bryan, DVM, MS, PhD, DACVIM (oncology)

Sandra Axiak-Bechtel, DVM, DACVIM (oncology) Brian K. Flesner, DVM, MS, DACVIM (oncology)

Number of weeks per year faculty member(s) is/are available to resident on a daily basis. Please list for each faculty member.

52 total Bryan – 17 weeks clinical Bechtel – 17 weeks clinical Flesner – 17 weeks clinical Henry – 2 weeks clinical

Faculty member on site?

Yes	No
X	

If off site, please explain relationship

c. Surgeon(s): (must be Diplomate(s) of the ACVS)

James Tomlinson, DVM, MVSci., Diplomate ACVS F.A. Mann, DVM, MS Diplomate ACVS, Diplomate ACVECC Derek B. Fox, DVM, Ph.D., Diplomate ACVS Joanne Kramer, DVM, Diplomate ACVS David Wilson, DVM, Diplomate ACVS Brian Torres, DVM, PhD, Diplomate ACVS-SA Jill Luther, DVM, MS, Diplomate ACVS-SA

Number of weeks per year faculty member(s) is/are available to resident on a daily basis. Please list for each faculty member.

Tomlinson – 12 weeks clinical Mann – 12 weeks clinical Fox – 22 weeks clinical Torres – 18 weeks clinical Luther – 40 weeks clinical

Faculty member on site?

Yes	No
X	

If off site, please explain relationship.

d. Pathologist(s): (must be Diplomate(s) of the ACVP)
Please specify if certification is in anatomic or clinical pathology.

Marlyn Whitney, DVM, PhD, Dipl. ACVP (Clinical Pathology) Gayle C. Johnson, DVM, PhD, Dipl. ACVP (Anatomic) Linda M. Berent, DVM, PhD, Dipl. ACVP (Dual) Charles Weidermeyer, DVM, PhD Dipl. ACVP (Clinical Pathology) Dae Young Kim, DVM, PhD, DACVP (Anatomic) Angela Royal, DVM, MS, DACVP (Clinical Pathology) Fred Williams III, DVM, DACVP (Anatomic)	

Number of weeks per year faculty member(s) is/are available to resident on a daily basis. Please list for each faculty member.

52

Faculty member on site?

Yes	No
X	

If off site, please explain relationship.

10. Please list all additional board certified specialists in direct support of the program. If offsite, please explain relationship.

Name	Certifying College / Board (including subspecialty if applicable)
O'Brien, Dennis DVM, MS, PhD,	ACVIM –Neurology
Coates, Joan DVM, MS,	ACVIM-Neurology

Branson, Keith DVM, MS,	ACVAA
Bukoski, Alex DVM, PhD,	ACVAA
Dodam, John DVM, MS, PhD	ACVAA
Giuliano, Elizabeth DVM, MS,	ACVO
Johnson, Philip BVSc, MS, MRCVS, Medicine, ECEIM	ACVIM-Large Animal Internal
Kerl, Marie DVM, MPH, ACVECC	ACVIM–Small Animal Internal Medicine,
Leach, Stacey DVM,	ACVIM-Cardiology
Pearce, Jacqueline DVM, MS,	ACVO
Reinero, Carol DVM, PhD,	ACVIM–Small Animal Internal Medicine
Leah A. Cohn**,** D.V.M., Ph.D.	ACVIM – Small Animal Internal Medicine

11. Please describe the role of the radiation oncology resident and the radiation oncology service in the daily clinical management of patients and clients.

The vast majority of radiation therapy cases are managed through the medical oncology service (with few exceptions being managed by equine, surgery, or neurology services). The radiation oncology service is integrated into the medical oncology service, and the resident is expected to have some primary case responsibility, while also assisting other clinicians in the therapy-related side effects of their patients. The radiation oncology service readily consults with other services regarding the role of radiotherapy in the management of cases, and regularly participates in daily medical oncology case rounds. Additionally, the entire radiation oncology service and the attending medical oncology service participate in weekly radiation therapy case rounds. The radiation oncology resident is expected to regularly see likely radiation therapy appointments through the medical oncology schedule, and generally will manage ~1/3 of the radiation oncology patients, and see 2-3 appointments per week.

12. How will the resident receive training in Medical Oncology? What is time allotted for this training? Please provide description of formal and informal training experiences as well as description of the resident's role while rotating on a medical oncology service.

The resident is required to take the Graduate Course in Medical Oncology given by the Oncology Faculty.
The resident is expected to attend the weekly staff rounds for the oncology section and the weekly radiation oncology rounds which includes the medical and radiation oncology faculty residents and technicians. The Resident will spend one month during the end of the first year of the program functioning as a medical oncology resident under the supervision and direction of the medical oncology faculty. The resident will repeat this one month on medical oncology during their second year (for a total of 2 months training).
In addition there is daily consultation between the radiation oncologists and medical oncologists. This communication is at the faculty and resident levels. There are currently three medical oncology residents in the hospital and the two services are closely integrated at all levels.

13. How will resident be trained in diagnostic imaging? What time is allotted for this training? Please provide description of formal and informal training experiences. Please specify if the resident is required to generate imaging reports while on diagnostic imaging rotation.

The resident is required to complete 1 month of formal diagnostic imaging training. During this training, the resident is required to attend, daily for 2 months, the radiology staff rounds in which all diagnostic imaging studies are reviewed and final consensus interpretation arrived at. Diagnostic residents present their cases at this session and are critiqued by an ACVR-DI diplomate. The resident will spend the remaining time evaluating radiology cases of all modalities, but will focus on volumetric imaging and imaging of oncology patients.

During the course of their program the radiation oncology resident is required to interpret imaging studies from all modalities for all radiation oncology cases under the supervision of the radiation oncology faculty, though particular focus will be spent on volumetric imaging and imaging in patients with cancer. Further instruction in diagnostic interpretation will occur in one-on-one discussions with diagnostic radiologists and the radiation oncologist on duty about interpretation of studies on oncology patients.

14. Will the resident be provided with training in anesthesia? If yes, please include a description of the training.

The resident will be trained by the residency director in the anesthetic equipment available. The resident will also have the option of participating in a rotation with the anesthesia service. There is frequent and open communication with the anesthesia service regarding the management of radiation therapy patients, and any anesthetic candidate with an elevated risk requires a group discussion with the resident, the attending clinician, the anesthetist, and, potentially, an anesthesiologist.

15. How will resident be trained in radiation biology? Please provide description of formal and informal training experiences.

The resident is required to take a 3 credit course in radiation biology taught through the Nuclear Sciences and Engineering Institute. This course is taken in the fall of the first year of the program. The resident is also offered a Radiochemistry course, which includes a fair amount of radiation biology content. Radiation Biology is reviewed during the didactic course in Radiation Therapy taught by Drs. Lattimer and Maitz. Journal readings from various oncology focused journals are assigned from time to time. Reading of the entire latest edition of Hall and the Basic Clinical Radiobiology (Joiner and Van der Kogel) are required, and the resident is encouraged to set up a book review with faculty.

16. How will resident be trained in cancer biology? Please provide description of formal and informal training experiences.

Cancer biology is covered as a portion of the course in Radiation Biology, Medical Oncology, and Radiation therapy as described above. The resident also participates in journal and book review with the medical oncology residents, which includes the reading of Tannock and Hill, as well as Weinberg. In addition, the section of radiology includes a full time tumor biologist (Dr. Michael Lewis) who participates in the medical oncology program. Journal readings from various oncology focused journals are assigned from time to time. Multiple seminars on various aspects of tumor biology both in the Department of Veterinary Medicine and Surgery and in the Medical School's Department of Hematology and Oncology are attended throughout the course of the program as well.

17. How will residents be trained in radiation oncology physics? Please include a description of the medical physics support for your program and the role of medical physicist(s) in the training of the resident.

If offered, the resident is required to take the course in Radiation Safety and physics taught by the faculty of the Nuclear Sciences and Engineering Institute which covers the basics of radiation physics and the safe use of radiation sources as well as shielding calculations. The resident is also given the option of taking the Intro to Radiochemistry course, which includes a detection lab, and covers, in depth, radiation interaction with matter and radiation physics. The resident will be required to take the Intro to Radiochemistry course if the Radiation Safety course is not offered. The resident is also required to take the radiation oncology course which addresses the physics of radiation oncology for teletherapy, brachytherapy and nuclear oncologic radioisotope therapy. The resident is required to learn and be able to perform daily, weekly, and monthly radiation safety and physics checks on the linear accelerator. The resident is required to perform hand dose calculations for radiation therapy treatments which are

checked by one of the ACVRO Diplomates. Informal discussion on radiation physics occur frequently in the course of the program. AAPM certified physicists are used to oversee the physics certification of the program and are available for consultation when need arises. Currently, the physicists are employed on a contracted basis, and do not spend any specified weekly hours at the hospital. The physicists are, however, readily available for discussion and on site for performing the annual Quality Assurance. Reading and discussion of Kahn's "The Physics of Radiation Therapy" is also required.

18. Please list any formal courses and their instructors included in the residency training curriculum. Please attach syllabi and instructor credentials for each listed course. NOTE: Please ensure syllabi are up-to-date within the last year.

Radiation Safety	[this course is being re-worked for 2017-2018 and a syllabus is not currently available]
Radiation Biology	Drs. Jeffrey Bryan, Michael Lewis, Charles Maitz
Medical Oncology	Dr. Carolyn Henry
Radiation Oncology	Dr. Jimmy Lattimer
Radiochemistry	Drs. Dave Robertson and Silvia Jurisson

19. Will the resident participate in clinical rounds on a daily basis while on clinical rotations? Is a supervising Diplomate available for the majority of rounds? If no, please describe how rounds are attended and supervised.

Yes	No
X	

Comments	A radiation oncology diplomate is present for approximately 50% of the daily rounds sessions, while an ACVIM diplomate is present at all daily rounds.

20 Are formal conferences, such as clinicopathologic conferences, journal clubs, or seminars held on a weekly basis?

Yes	No
X	

Comments:	Residents are encouraged to attend seminars and rounds presented by the Department of Hematology Medical Oncology at the Medical School when relevant topics are being presented in addition to similar conferences and meeting in the Department of Veterinary Medicine and Surgery. There are close ties between these two departments as several faculty members hold either dual appointments in both departments or adjunct status in one department or the other

21. Please provide a description of the conferences, etc., that are provided and the typical schedule. Please specify which conferences are mandatory vs. optional

Clinicopathologic conferences are held on Wednesday morning where oncology cases which have pathologic confirmation either from biopsy or post mortem are presented by the clinician and the pathologist involved. Discussion of treatments and outcomes are part of the conference. Oncology journal club (Tuesday morning) reviews current articles as well as "landmark" articles from the literature relevant to the subject of the journal club, as well as the textbooks Withrow and MacEwen, Tannock and Hill, and others. Cytology rounds are optional, and include review of interesting cytology cases, run by the clinical pathology faculty. Rad Onc Book Club (Friday morning)is resident-led and reviews Hall and Giaccia, Khan, and Joiner and Van der Kogel. Oncology Grand rounds are held monthly at the medical school and are strongly encouraged.

22. Is the resident required to give one or more formal presentations at a conference or in an educational setting on a yearly basis? If yes, please provide a description of the requirement.

Yes	No
X	

Comments:	The resident is required to present one seminar to the clinic faculty, house officers and students each year. The topic of this seminar is usually a general topic presentation the first year and the results of a clinical investigative project the second year. The resident is also expected to present an abstract at a scientific meeting at some point during the residency (ACVR, VCS, or Radiation Research Society (RRS)).

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

None	One	Two	> Two
			X

Comments:	The resident should attend a scientific meeting every year. The resident is expected to attend at least one ACVR meeting and one RRS meeting during the course of the program. This is done at departmental expense. Attendance of VCS, ASTRO and/or RSNA is also encouraged.

24. Does the training program require a research project? Please indicate the number of research projects required.

Yes	No	Optional	Number
X			1

Comments:	A basic science radiobiology project is required for the Master's Program. This investigation will be of strong clinical relevance.

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

Yes	No	Number
	X	

Comments:	The resident is strongly encouraged to submit their project for publication, but publication is not required.

26. 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. For facilities that are not on-site, please describe the situation and availability in the space at the end of this section.

Equipment / Service	**Available?**		**On-Site?**	
	Yes	No	Yes	No
Megavoltage Teletherapy Machine Please specify manufacturer and model: Varian 2100 EX and Siemens Oncor Impression +	X		X	
Multileaf collimator **Please specify number of leaves: 120 (varian); 92 (Siemens)	X		X	
On-board portal or CT imaging **Please specify type: PortalVision (varian); Fuji CR system (Siemens)	X		X	
3D - Computer based treatment planning system Please specify manufacturer and model: RayStation 4.7, CMS/Elekta XiO 3.4	X		X	
2D/2.5 D - Computer based treatment planning system Please specify manufacturer and model: CMS/Elekta XiO 3.4* (Capable of 3D or 2D planning)	X		X	
Intensity Modulated Radiation Therapy	X		X	
Stereotactic Radiation Therapy or Radiosurgery		X		
Strontium-90 Plesiotherapy	X		X	
LDR Brachytherapy treatment and planning	X		X	

HDR Brachytherapy treatment and planning	X		X	
Diagnostic Radiology / Imaging Services	X		X	
Conventional Radiography	X		X	
Fluoroscopy	X		X	
Ultrasound	X		X	
Nuclear Medicine	X		X	
Computed Tomography	X		X	
Magnetic Resonance Imaging	X		X	
Positron Emission Tomography	X		X	
Intensive Care Facility - 24 hours	X		X	
Clinical Pathology capabilities: (includes CBC, serum chemistries, blood gases, urinalysis, cytology, parasitology, microbiology, and endocrinology)	X		X	
Veterinary Library w/ Literature Searching Capabilities	X		X	
Medical Library w/ Literature Searching Capabilities	X			X
Computerized Medical Records w/ Searching Capability	X		X	

If any of the above equipment or facilities are available off-site, please explain how the resident can access them for case management, research, or study.

University of Missouri Medical Library is less than ½ miles from the VHC and can be accessed directly by residents and through intrabranch association with the Veterinary Medical Library.
The Department of Veterinary Medicine and Surgery also operates Mizzou Animal Cancer Care which is off-site radiation therapy and clinical trials center located in Wenztville Missouri about 85 miles from the main VHC. This facility contains digital radiographic equipment, a multislice spiral CT and the Varian 2100 EX accelerator. The resident is occasionally required to accompany a radiation oncologist to this facility and to participate in the planning of treatments administered at that facility.

27. Please list numbers of patients treated in the last 12 months using the listed radiation treatment modalities.

Modality	Number Treated*
Megavoltage Gamma / X-ray Teletherapy	173
LDR Brachytherapy	4
HDR Brachytherapy	7
Injectable Radionuclide therapy	42 (see below for isotope breakdown)
Radioiodine	23 feline 7 canine
Other (please specify) ^{153}Sm ^{90}Y	5 7
^{90}Strontium Plesiotherapy	5
Other - please specify	

* indicate N/A (not applicable) if the treatment modality is not available

28. Describe procedures for resident record recording of radiation treatment details of all patients.

A detailed prescription sheet is filled out for all beam radiation therapy patients. This includes the demographic of the patient. The details of each beam used and the number of beams used. The administration of each beam is recorded in the Record and Verify System (Mosaiq). For the majority of the beam treatments a computerized treatment plan is developed and printed. Isodose profiles for key areas of the treatment field and DVH's are closely evaluated. For treatments done without computerized planning the prescription form is filled out by hand and checked by the radiation oncologist. For brachytherapy and pliesiotherapy the number of needles/fields used and the dose rate and given dose are recorded in the medical record. All of these records are maintained in radiation oncology. For the facility in the VHC an electronic Record and Verify system is present and all records also maintained as part of the electronic medical record.

29. What procedures are in place to facilitate collection of follow up information of patients treated? What is a standard recheck schedule for patients? In the absence of routine patient rechecks at the facility, is there a system in place to obtain follow-up?

Both the section of Medical Oncology and the Section of Radiation Oncology maintain computerized patient lists which include the treatment, treatment date, tumor type and other information such as client address etc. In hospital follow-up is requested for the first year in most radiation oncology patients. Follow-up has been recently identified as a problem with our section, and we are working to implement new methods to ensure adequate follow up for patients. We intend to implement an effective system to requests for follow-up information on the status of the patients quarterly unless notification of the patient's demise is received.

30. By what mechanisms and how often will trainees be evaluated? Please attach form used in this evaluation (required). Please comment on radiation therapy specific evaluation as well as general clinical evaluation.

Written evaluations at six month intervals and oral evaluations at other times as needed.

31. If applicable, 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. If at all possible, please provide an address, and any information you have on the status of each individual with respect to the board certification process.

Terri Tucker-Warhover DVM 2003-2005
David Bommarito DVM, MS 2006-2008 Los Angeles CA, ACVRO Diplomate 2008, ACVIM (Medical Oncology) 2011
Koiche Nagata DVM, 2008-2010, Athens GA, ACVRO Diplomate 2010
Stephanie Cook DVM, 2010-2012, Dallas TX, ACVRO Diplomate 2012
Kimberly Selting DVM, MS, 2009-2013, Columbia, MO, ACVRO Diplomate 2013
Charles Maitz, DVM, PhD, 2010-2014, Columbia, MO, ACVRO Diplomate 2014
Jenny Schutte, DVM, 2014-2016, Columbus, OH

32. Please list any additional information of interest in support of this residency application.

We are also submitting for re-approval of our existing 2-year residency program, however this 3-year program will likely be our standard residency program. We would like to maintain the option of the 2 year residency for candidates with extensive prior experience, such as advanced degrees, or previous specialty internships. The 3 year program allows for more time spent on basic laboratory research and out-rotations at human radiation oncology centers. All personnel and coursework involved in resident training has been approved for the 2-year residency program.

Attachments:

Please attach the following documents to the application if applicable. Please mark box to indicate which documents are included. Please list any addition documents attached in support of this application.

NOTE: Please ensure CVs, syllabi, and letter(s) of agreement are **current** within the past year.

Attached?	Documents
YES	Calendar of resident's activities (24 or 36 month), including required rotations and vacation - Required
YES	CV - ACVR-RO Diplomate(s) - Required
YES	CV - ACVR-R and/or ECVDI Diplomate(s) - Required
YES	CV - ACVIM-O Diplomate(s) - Required
YES	Syllabi of formal course work included in the training program - Required
YES	Credentials of instructors providing formal course work - Required
YES	Forms used in resident evaluation – Required
N/A	Letters of agreement from cooperating institutions – Required