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 http://www.acvr.org/page/diplomate-training.

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 (https://www.acvr.org/page/contact-us). The application must be received at least 60 days before the meeting of the Executive Council at which the program will be evaluated. There are two meetings of the 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 http://www.acvr.org/ and are printed in each issue of Veterinary Radiology & Ultrasound. There will be no exceptions to the 60 day lead time requirement. The Residency Standards and Evaluation Committee will evaluate the application, vote, and forward the results of the vote and the majority to the President of the Recognized Specialty of Radiation Oncology for consideration by the 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 two 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

9/23/2016

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

Keijiro Shiomitsu, DVM, DAVCR

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

46

Program Director’s Contact Information:

<table>
<thead>
<tr>
<th>Work Phone</th>
<th>352-392-2235</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax</td>
<td>352-846-2445</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:kshiomitsu@ufl.edu">kshiomitsu@ufl.edu</a></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Standard Program</th>
<th>Alternative Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

The following conditions define an Alternative Program:

a. 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.

b. 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 Florida
   - Department
   - Department of Small Animal Clinical Sciences
   - Hospital/University
   - University of Florida, College of Veterinary Medicine
   - Address
   - 2015 SW 16th Ave.
   - City, State Zip Country
   - Gainesville, FL, 32610

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

   Department
   - 
   - Hospital/University
   - 
   - Address
   - 
   - City, State Zip Country

   For cooperating institutions, attach letters of agreement signed on behalf of the institution(s) by appropriate individual(s).
6. Length of Training Program (months):

   24 months

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

   N/A

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

   18 months

8. Advanced Degree:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PhD</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
9. Essential Program Faculty: 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)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clifford R. Berry, DVM, DACVR</td>
<td></td>
</tr>
<tr>
<td>Erin Porter, DVM, DACVR</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clifford R. Berry, DVM, DACVR</td>
<td></td>
<td>23 weeks</td>
</tr>
<tr>
<td>Erin Porter, DVM, DACVR</td>
<td></td>
<td>33 weeks</td>
</tr>
</tbody>
</table>

Faculty member on site?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

If off site, please explain relationship.

<table>
<thead>
<tr>
<th>Amandine Lejeune, DVM, DACVIM (Medical Oncology)</th>
</tr>
</thead>
</table>

b. Medical Oncologist(s): (must be Diplomate(s) of ACVIM, Specialty of Oncology)
Rowan Milner, DVM, DACVIM (Medical Oncology)
Anna Szivek, DVM, DACVIM (Medical Oncology)

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

Amandine Lejeune, DVM, DACVIM (Medical Oncology); 34 weeks
Rowan Milner, DVM, DACVIM (Medical Oncology); 10 weeks
Anna Szivek, DVM, DACVIM (Medical Oncology); 33 weeks

Faculty member on site?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>X</td>
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</tbody>
</table>

If off site, please explain relationship

N/A

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

Sarah Boston, DVM, ACVS, Fellow in Surgical Oncology
Carlos Souza, DVM, ACVS, Fellow in Surgical Oncology

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

Sarah Boston, DVM, ACVS, Fellow in Surgical Oncology; 26 weeks
Carlos Souza, DVM, ACVS, Fellow in Surgical Oncology; 26 weeks
Faculty member on site?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td></td>
<td>X</td>
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</tbody>
</table>

If off site, please explain relationship.


d. Pathologist(s): (must be Diplomate(s) of the ACVP)

Jeffrey R. Abbott, DVM, PhD, DACVP (Anatomic pathology)
William L. Castleman, DVM, PhD, DACVP (Anatomic pathology)
Michael J. Dark, DVM, PhD, DACVP (Anatomic pathology)
Serena Craft, DVM, DACVP (Anatomic pathology)
Sarah Beathy, DVM, DACVP (Clinical pathology)
Marry Leissinger, DVM, DACVP (Clinical pathology)

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

Jeffrey R. Abbott, DVM, PhD, DACVP (Anatomic pathology) ; 14 weeks
William L. Castleman, DVM, PhD, DACVP (Anatomic pathology) ; 12 weeks
Michael J. Dark, DVM, PhD, DACVP (Anatomic pathology) ; 20 weeks
Serena Craft, DVM, DACVP (Anatomic pathology) ; 14 weeks
Sarah Beathy, DVM, DACVP (Clinical pathology) ; 26 weeks
Marry Leissinger, DVM, DACVP (Clinical pathology) ; 26 weeks
Faculty member on site?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

If off site, please explain relationship.

N/A

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Certifying College / Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard C. Hill</td>
<td>DACVIM (Internal Medicine)</td>
</tr>
<tr>
<td>Kirsten Cooke</td>
<td>DACVIM (Internal Medicine)</td>
</tr>
<tr>
<td>Alex Gallagher</td>
<td>DACVIM (Internal Medicine)</td>
</tr>
<tr>
<td>Andrew Specht</td>
<td>DACVIM (Internal Medicine)</td>
</tr>
<tr>
<td>Neurology Staff: Sheila Carrera-Justiz, Gabriel A Garcia</td>
<td>DACVIM (Neurology)</td>
</tr>
<tr>
<td>Anesthesia staff: Andre Shih, Fernando Garcia-Pereira, Bonnie Gaston</td>
<td>ACVAA</td>
</tr>
<tr>
<td>Clinical pathology staff: Mary Leissinger, Sarah Beatty</td>
<td>ACVP</td>
</tr>
<tr>
<td>Dermatology staff: Dunbar Gram, Rosanna Marsella</td>
<td>DACVD</td>
</tr>
<tr>
<td>Ophthalmology staff: Caryn Plummer, David Whitley, Ralph Hamor</td>
<td>DACVO</td>
</tr>
<tr>
<td>Cardiology staff: Simon Swift, Meg Sleeper</td>
<td>ECVIM,DACVIM (Cardiology)</td>
</tr>
</tbody>
</table>
11. 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.

The oncology service at the University of Florida is a comprehensive cancer treatment facility with surgical, medical, and radiation oncology in a combined service. We are staffed by three medical oncology, two surgical oncology, and one radiation oncology faculty. The resident will have primary responsibilities for clinics and will receive medical oncology cases under the supervision of medical, surgical or radiation oncology faculty members. Clinical training and experience will be provided via case management and care of companion animals with oncological diseases. During the medical oncology rotation, the resident will perform staging tests and clinical problem solving, manage hospitalized cases, and handle chemotherapy agents. The resident will spend four weeks in first year and another four weeks in second year (total two months) with the medical oncology service. As we are a combined service, the resident will participate in daily case rounds, and have the benefit of interaction with medical, surgical and radiation oncologists.

We also have numerous oncology related rounds and the resident will participate in a bi-weekly oncology journal club, weekly tumor board rounds, (interdisciplinary rounds for ongoing case management discussion with the entire service), weekly medical oncology class (book chapters from key books such as Tannock and Hill, or Chabner) with the medical oncology house officers, and weekly onco-pathology rounds.

12. How will the resident be trained in diagnostic imaging? What time is allotted for this training? Please provide description of formal and informal training experiences.

The resident will spend four weeks in diagnostic radiology service. The resident will
be trained to generate reports of imaging studies under supervision of radiology faculty. The resident will have opportunities to be involved in multiple imaging modalities such as CT, MRI, ultrasound, nuclear medicine, and radiography. Special emphasis will be placed on oncologic imaging and oncologic patients who present as a part of staging and/or radiation therapy planning. During this rotation, the resident will participate in daily radiology rounds to discuss cases.

13. How will the resident be trained in radiation biology?

The resident is required to take radiation biology in their second year of residency. The courses/lectures will be provided through radiation oncology residency program at University of Florida, College of Medicine (course schedule attached).

In addition, the resident will participate in bi-weekly radiation oncology journal club to discuss radiation physics/biology topics with Dr. Shiomitsu (DACVR-RO).

14. How will the resident be trained in cancer biology?

The resident will participate a bi-weekly Oncology journal club, weekly tumor board rounds, (interdisciplinary rounds for ongoing case management discussion with the entire service), and weekly medical oncology class (book chapters from key books such as Tannock and Hill, Basic Science of Oncology or Chabner, Cancer Chemotherapy and Biotherapy: Principles and Practice ) with the medical oncology house officers.

15. How will the resident be trained in radiation oncology physics?

The resident is required to take a radiation physics course in the first year of residency.
The courses/lectures will be provided through the radiation oncology residency program at University of Florida, College of Medicine (Syllabus and course schedule attached).

The University of Florida has a Medical Physic program in the department of Biomedical Engineering. In addition, the resident will be trained in QA for IMRT plans by Dr. Frank Bova, PhD (Lillian S. Wells Department of Neurosurgery at University of Florida) and his medical physics team. Dr. Bova and his medical physics team will provide support such as monthly QA, annual QA, patient QA and manual calculation check, etc). The resident will meet with the medical physics team two to three times a week. The UF veterinary radiation oncology program has been working closely with Dr. Bova for more than 15 years, resulting in many collaborative works and publications. The radiation physics and radiation therapy plans are reviewed by Dr. Bova. The resident also attends monthly and/or annual QA for the Linear accelerator machine in the hospital. In addition, the resident will also have opportunity to attend seminar or rounds on medical physics at University of Florida, College of Medicine.

16. Please list any formal courses and their instructors included in the residency training curriculum. Please attach syllabi and instructor credentials for each listed course.

- Radiation Physics (1st year): Radiation oncology residency program at University of Florida, College of Medicine. (Jonathan G. Li, PhD, attached CV)
- Radiation Biology (2nd year): Radiation oncology residency program at University of Florida, College of Medicine. (Robert J. Amdur, MD, attached CV)

17. 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.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>X</td>
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</tbody>
</table>

Comments: Board rounds will be conducted each morning. In the afternoon, case
rounds will be conducted, and medical, surgical, and radiation oncology faculty are present and discuss/review each case.

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

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
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</table>

Comments: The resident will participate in weekly tumor board rounds (interdisciplinary rounds for ongoing case management discussion with the entire service), weekly medical oncology class with the medical oncology house officers, and weekly onco-pathology rounds.

19. Please provide a description of the conferences, etc., that are provided and the typical schedule.

Weekly house officer seminar series: house officers from the entire hospital: (Attendance required)
Bi-weekly Radiation Oncology journal club: (Attendance expected)
Bi-weekly Oncology journal club: (Attendance expected)
Weekly tumor board rounds, (interdisciplinary rounds for ongoing case management discussion with the entire service): (Attendance expected)
Weekly medical oncology class (book chapters from key books such as Tannock and Hill, or Chabner, Cancer chemotherapy and biotherapy): (Attendance expected)
Weekly onco-pathology rounds: (Attendance expected)
Many other clinical veterinary rounds opportunities would be available for the resident if he/she is interested in those areas.
20. Is the resident required to give one or more formal presentations at a conference or in an educational setting on a yearly basis?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>X</td>
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</tbody>
</table>

Comments: The resident will be required to present once a year for their topic of interest, and/or planning/ongoing research project. The resident is highly encouraged to present their data at the ACVR annual conference during his/her 2nd year of residency.

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

<table>
<thead>
<tr>
<th>None</th>
<th>One</th>
<th>Two</th>
<th>&gt; Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
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</tbody>
</table>

Comments: The resident is highly encouraged to attend the ACVR annual meeting to present his/her research. The resident is also encouraged to attend either VCS, ASTRO, RSS if possible.

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

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Optional</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Comments: Completion of a research project by the end of the program is required.

24. Are one or more publications required as part of the training program?
Publication is not a requirement. However, completion of a research project by the end of the program is required for attainment of the residency certificate at University of Florida, Veterinary Clinical Sciences.

25. 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.

<table>
<thead>
<tr>
<th>Equipment / Service</th>
<th>Available?</th>
<th>On-Site?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Megavoltage Teletherapy Machine</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Please specify manufacturer and model:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varian 21EX, 6MV Linac with MLCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3D - Computer based treatment planning system</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Please specify manufacturer and model:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Eclipse, Version 13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2D/2½ D - Computer based treatment planning system</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Please specify manufacturer and model:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDR Brachytherapy treatment and planning</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HDR Brachytherapy treatment and planning</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Diagnostic Radiology / Imaging Services</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Equipment/Service</td>
<td>Availability</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Conventional Radiography</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Fluoroscopy</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Nuclear Medicine</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Computed Tomography</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Magnetic Resonance Imaging</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Positron Emission Tomography</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Intensive Care Facility - 24 hours</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Clinical Pathology capabilities: (includes CBC, serum chemistries, blood gases, urinalysis, cytology, parasitology, microbiology, and endocrinology)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Veterinary Library w/Literature Searching Capabilities</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Medical Library w/Literature Searching Capabilities</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Computerized Medical Records w/Searching Capabilities</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

26. 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.

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

<table>
<thead>
<tr>
<th>Modality</th>
<th>Number Treated*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megavoltage Gamma / X-ray Teletherapy</td>
<td>120</td>
</tr>
<tr>
<td>LDR Brachytherapy</td>
<td>N/A</td>
</tr>
<tr>
<td>HDR Brachytherapy</td>
<td>N/A</td>
</tr>
<tr>
<td>Injectable Radionuclide therapy</td>
<td>N/A</td>
</tr>
<tr>
<td>Radioiodine</td>
<td>31</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>N/A</td>
</tr>
<tr>
<td>(^{90})Strontium Pleisotherapy</td>
<td>1</td>
</tr>
<tr>
<td>Other - please specify</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* indicate N/A (not applicable) if the treatment modality is not available
Describe procedures for resident record recording of radiation treatment details of all patients.

The resident is responsible for filling out the radiation oncology record using routine electronic medical records. The details to be recorded are daily physical examination, daily SOAP, daily observations, daily assessment (including side effects), and anesthesia notes. The resident will check the patient’s record and evaluate previous medical history, imaging, diagnosis (histopathology or clinical pathology reports), and other related information.

The Eclipse Record and Verify System (ARIA) is used to document and record all aspects of radiation therapy treatment on the Linac. Treatment planning summary, screen shot of isodose distribution (transverse, coronal, and sagittal images) and DVH (dose volume histogram) are exported from Eclipse treatment planning system for each cases, and also those documents are saved in the routine electronic medical record system. After the medical physicist generates a quality assurance plan, the resident will review and put the result in the routine electronic medical record system. For manual treatment plans, worksheets are used to perform dose calculations and kept in the routine electronic medical record system.

28. What procedures are in place to facilitate collection of follow up information of patients treated?

Routine radiation side effects recheck are recommended at two weeks, four weeks, and every three to four months after completion of radiation therapy. The radiation oncology technician calls and contacts with owners to obtain follow-ups every two to three times a year if they are unable to physically return to UF for the recheck. When the radiation patient comes back to either the medical oncology or the radiation oncology service, photographs of the radiation site are taken and the photos are recorded in the routine electronic medical record system.
29. By what mechanisms and how often will trainees be evaluated? Please attach form used in this evaluation (required).

Residents are evaluated by radiation, medical and surgical oncologists every six months. A formal evaluation meeting is also conducted once a year with the resident and all oncology faculty. The resident’s performance, class grades, research focus, and project progress will be discussed in the meeting.

30. 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.

N/A

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

All radiation oncology patients will be anesthetized by one of our radiation oncology technician who used to work UF veterinary anesthesia department for 20 years. When the technician is not available, UF veterinary anesthesia service will anesthetize radiation oncology patients. The resident may have the opportunity to get training in anesthesia.
Attachments:

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

<table>
<thead>
<tr>
<th>Attached?</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Twenty-four (24) month calendar of resident’s activities - <strong>Required</strong></td>
</tr>
<tr>
<td>X</td>
<td>CV - ACVR-RO Diplomate - Program Director(s) - <strong>Required</strong></td>
</tr>
<tr>
<td>X</td>
<td>CV - ACVR-R Diplomate(s) - <strong>Required</strong></td>
</tr>
<tr>
<td>X</td>
<td>CV - ACVIM-O Diplomate(s) - <strong>Required</strong></td>
</tr>
<tr>
<td>X</td>
<td>Syllabi of formal course work included in the training program – <strong>Required</strong></td>
</tr>
<tr>
<td>X</td>
<td>Credentials of instructors providing formal course work - <strong>Required</strong></td>
</tr>
<tr>
<td>X</td>
<td>Forms used in resident evaluation - <strong>Required</strong></td>
</tr>
<tr>
<td>N/A</td>
<td>Letters of agreement from cooperating institutions - <strong>Required</strong></td>
</tr>
</tbody>
</table>
Radiation Oncology Residency Calendar
University of Florida,

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>Radiology</td>
<td>RO</td>
<td>RO/research</td>
<td>MO</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>RO/Vac</td>
</tr>
<tr>
<td>2nd Year</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>MO</td>
<td>RO/research</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>RO</td>
<td>RO/Vac</td>
</tr>
</tbody>
</table>

RO – radiation oncology (minimum 18 months total): The residency will be dedicated to the radiation oncology service. During the 18 month training period in radiation oncology, the resident will perform but is not limited to the following tasks:
• pretreatment evaluation of oncology patients (New and recheck radiation oncology appointments)
• formulation of diagnostic (staging) and treatment plans
• set-up of patients in positioning device for CT scans for RT planning
• ongoing primary case management
• assessment of tumor and normal tissue response (acute side effects management)
• continued assessment of long-term tumor and normal tissue response in patients the trainee has treated with radiation therapy
• development of computerized and manual radiation therapy treatment plans
• assist in daily patient positioning, general anesthesia, portal/CBCT (cone beam CT) imaging assessment
• in house consultation for potential radiation therapy cases
• telephone consultation with referring veterinarians for potential radiation therapy cases

MO – medical oncology (two months): The resident will spend a total of two months with the medical oncology service. The responsibilities include but are not limited to: diagnostic staging, primary ongoing case management, side effects management, and treatment (chemotherapy, immunotherapy, or radiation therapy). The resident will assist the medical oncology technical staff in chemotherapy administration.

Radiology
The resident will spend one month with the diagnostic radiology service. The resident will generate reports of imaging studies under the supervision of the radiology faculty. The resident will have opportunities to be involved in multiple imaging modalities such as CT, MRI, ultrasound, nuclear medicine, and radiography. Special emphasis will be placed on oncologic imaging/oncologic patients who presented as a part of staging and/or radiation therapy planning. During this rotation, the resident will participate in daily radiology rounds to discuss cases.
Research
The resident will spend a total of four weeks for their research project.

Vacation
The resident will have a four week vacation/off clinic.
BIOGRAPHICAL SKETCH

NAME
Keijiro Shiomitsu

POSITION TITLE
Associate Professor

e-common user name
SHIOMITSU

EDUCATION/TRAINING (Begin with undergraduate BA/BS or equivalent. Include postdoctoral training (internship/residency/fellowship, etc.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azabu University</td>
<td>BV.Sc</td>
<td>1991-97</td>
<td>Veterinary Medicine</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>Resident</td>
<td>2006-08</td>
<td>Radiation Oncology</td>
</tr>
</tbody>
</table>

A. Certification

2008  Diplomate of the American College of Veterinary Radiology (Radiation Oncology),

B. Positions and Honors

08/03-12/05  Research Assistant, Department of Veterinary Clinical Sciences, SVM, LSU, Baton Rouge, LA
01/06-07/06  Clinical Instructor of Radiation Oncology, Department of Veterinary Clinical Sciences, SVM, LSU, Baton Rouge, LA
08/06-07/08  Radiation Oncology Resident, College of Veterinary Medicine, North Carolina State University, Raleigh, NC.
08/08-07/2014  Assistant Professor, Department of Veterinary Clinical Sciences, SVM, LSU, Baton Rouge, LA
08/14-07/2015  Associate Professor, Department of Veterinary Clinical Sciences, SVM, LSU, Baton Rouge, LA
08/15-present  Associate Professor, Department of Veterinary Clinical Sciences, UF, Gainesville, FL

B. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.

1. LaRue, M., Brian, F., Shiomitsu, K. Treatment of a Thyroid Tumor in an African Pygmy Hedgehog (ATELERIX ALBIVENTRIS), Journal of Exotic Pet Medicine, Accepted.


Book chapters

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. DO NOT EXCEED FOUR PAGES.

NAME
Amandine Lejeune

POSITION TITLE
Clinical Assistant Professor in Oncology

eRA COMMONS USER NAME (credential, e.g., agency login)
alejeune

EDUCATION/TRAINING: (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lycee Albert Calmette, NICE, FRANCE</td>
<td>Baccalaureat</td>
<td>7/2000</td>
<td>Biology, Math, Chemistry</td>
</tr>
<tr>
<td>National Veterinary School of Maisons-Alfort, FRANCE</td>
<td>DVM</td>
<td>5/2008</td>
<td>Veterinary Medicine</td>
</tr>
<tr>
<td>UC Davis veterinary school</td>
<td>DACVIM</td>
<td>7/2013</td>
<td>Oncology</td>
</tr>
</tbody>
</table>

Please refer to the application instructions in order to complete sections A, B, C, and D of the Biographical Sketch.

A. Personal Statement
I am a veterinary medical oncologist with expertise in cancer diagnosis and treatment with chemotherapy. I work in a comprehensive cancer treatment facility along with surgical, medical and radiation oncologists. I am working directly with Dr. Shiomitsu, as well as three other medical oncologists (Dr. Milner, Dr. Szivek, Dr. Souza), and two surgical oncologist (Dr. Boston, Dr. Souza). I am coordinator of the medical oncology residency at UF; our medical oncology program is currently training 4 residents, and we also have an oncology intern. I am looking forward to be part of the training of a radiation therapy resident at UF.

B. Positions and Honors
Positions and employment:
2005 - Veterinary assistant at Doctor Nguyen's small animal private clinic, Nice, France
2005 - Veterinary assistant at Doctor Dirson's veterinary clinic, Bugeat, France
2006-2007 Night emergency veterinarian, Doctors Baron and Costa's small animal clinic, Draveuil, France
2008-2009 Small Animal Rotating Internship at Cummings Veterinary School of Tufts University, North Grafton, MA, USA
2009-2010 Small Animal Oncology Intern at Ontario Veterinary College (OVC), University of Guelph, Guelph, ON, Canada
2010-2013 Small Animal Medical Oncology Resident at University of California-Davis School of Veterinary Medicine, Davis, CA, USA

Other Experience and Professional Memberships:
Member of Veterinary Cancer Society
Member of American College of Veterinary Internal Medicine
Member of American Veterinary Medical Association

Honors:
Baccalaureat Mention Tres Bien in 2000
C. Selected Peer-reviewed Publications


May 2008 Veterinary Thesis: Cancérologie appliquée aux sarcomes chez le chien, étude clinique, pronostic et modalités thérapeutiques

Clinical response and adverse event profile of bleomycin chemotherapy for canine multicentric lymphoma Smith, A. Lejeune2, K. Kow3,, C. Souza, and R.J. Milner - JAHAA (submitted December 2015, accepted JAAHA-MS-6598R1)

D. Research Support
Ongoing research:
- Effect of Metabolism on Developing TCC in Dogs. Drs. Milner, Vulpe, Lejeune
- Response rate to single agent vinblastine in canine multicentric lymphoma. Drs. Lejeune, Harding.
- In vitro effects of the chemotherapy agent Paccal Vet (Paclitaxel) on canine mast cell cell lines. Drs. Shiomitsu, Lejeune.
- Ammonia levels following administration of L-asparaginase in canine hematopoietic neoplasia. Speas A, Lyles S, Milner R, Lejeune A, Kow K
- Biological behaviour of canine maxillary osteosarcoma; a retrospective study. Lejeune A

Ongoing research/Data collection:
- Prospective, multicentre, randomised, double-blind, placebo controlled, 2-parallel groups, phase 3 study to compare efficacy and safety of masitinib to placebo in the treatment of grade 2-3 nonresectable mast cell tumors in dogs not previously treated with chemotherapy (other than corticosteroids) or radiotherapy (AB Science)
- Immunotherapy for canine malignant melanoma (GD3 UF melanoma vaccine)
- Vinblastine chemotherapy as a first line treatment for multicentric lymphoma in dogs
- Immunotherapy for canine appendicular ositosarcoma

Grant:
Spring Consolidated Faculty Research Development Award Grant Competition, fund provided by James Edmundson Ingraham Endowed Fund: In vitro effects of chemotherapy agent Bleomycin on canine histiocytic sarcoma cell lines. Speas A, Milner R, Kow K, Lejeune A
Effect of Metabolism on Developing TCC in Dogs. Drs. Milner, Vulpe, Lejeune
BIOGRAPHICAL SKETCH

NAME
ANNA SZIVEK

POSITION TITLE
Assistant Clinical Professor

e-common user name

EDUCATION/TRAINING (Begin with undergraduate BA/BS or equivalent. Include postdoctoral training (internship/residency/fellowship, etc.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>University of Arizona</td>
<td>BV.Sc</td>
<td>2006</td>
<td>Veterinary Medicine</td>
</tr>
<tr>
<td>University of Arizona, College of Agriculture</td>
<td>Resident</td>
<td>2008-11</td>
<td>Medical Oncology</td>
</tr>
</tbody>
</table>

A. Certification

Board Certified in Oncology, American College of Veterinary Internal Medicine (ACVIM-MO).

B. Positions and Honors

March 2016 – Current
University of Florida – Small Animal Hospital, College of Veterinary Medicine
Gainesville, Florida
- Assistant Clinical Professor of Oncology

June 2006 – March 2016
Pusch Ridge Pet Clinic
Gregory Lee, DVM
Tucson, Arizona
- Small Animal General Practice Relief Veterinarian

March 2015 – January 2016
Mississippi State University – Animal Health Center, Veterinary Teaching Hospital
Starkville, Mississippi
- Assistant Clinical Professor of Oncology

September 2015
University of Florida – Small Animal Hospital, College of Veterinary Medicine
Gainesville, Florida
- Locum Clinical Faculty in Medical Oncology

September 2011 – January 2015
Veterinary Specialty Center of Tucson
Tucson, Arizona
- Veterinary Medical Oncologist

January 2011
Colorado State University – Animal Cancer Center, Veterinary Teaching Hospital
Sue LaRue, DVM, MS, PhD, DACVS, DACVR (Radiation Oncology)
Fort Collins, Colorado
- Small Animal Radiation Oncology Externship

July 2010
University of Arizona – Arizona Cancer Center, University Medical Center
Ravi Krishnadasan, MD
Tucson, Arizona
- Hematology and Medical Oncology Externship

June 2008
Veterinary Specialty Group
Peter Walsh, DVM, DACVS, MVSc
Sacramento, California
- Small Animal Surgical Oncology Externship

November 2006
University of Wisconsin – Madison, Veterinary Medical Teaching Hospital
Ruthanne Chun, DVM, DACVIM (Medical Oncology)
Madison, Wisconsin
- Small Animal Medical Oncology Externship

May 2001 – December 2005
Northwest Pet Clinic
Gregory Lee, DVM
Tucson, Arizona
- Small Animal Veterinary Technician

B. Selected peer-reviewed publications (in chronological order).

Veterinary Endoscopy Society – April 2015

Veterinary Cancer Society – October 2009

Veterinary Cancer Society – October 2008
A. Szivek, R. Burns, B. Gericota, V. Affolter, M. Kent, C.O. Rodriguez, and K. Skorupski. A Retrospective Study of 94 Cases of Dermal
BIOGRAPHICAL SKETCH

Provide the following information using a NIH-style BioSketch for a just-in-time training grant.

DO NOT EXCEED FOUR PAGES in Arial, Helvetica, Palatino, and Georgia using 11-12 font.

NAME
Milner, Rowan J.

POSITION TITLE
Associate Professor and Chair of Small Animal Clinical Sciences

Approximate % FTE (added total should not exceed 100%)
Research 25%  Teaching 25%  Service 50%

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>University of Pretoria, South Africa</td>
<td>BVSc (DVM)</td>
<td>1980</td>
<td>Veterinary Science</td>
</tr>
<tr>
<td>University of Pretoria, South Africa</td>
<td>BVSc (Hons)</td>
<td>1993</td>
<td>Veterinary Internal Medicine</td>
</tr>
<tr>
<td>University of Pretoria, South Africa</td>
<td>MMedVet</td>
<td>1997</td>
<td>Veterinary Internal Medicine</td>
</tr>
<tr>
<td>European College of Vet Internal Med</td>
<td>Dip ECVIM (CA)</td>
<td>1999</td>
<td>Veterinary Internal Medicine</td>
</tr>
<tr>
<td>European College of Vet Internal Med</td>
<td>Dip ECVIM (CA)</td>
<td>2005</td>
<td>Medical Oncology</td>
</tr>
<tr>
<td>American College of Vet Internal Med</td>
<td>Dip ACVIM</td>
<td>2009</td>
<td>Medical Oncology</td>
</tr>
<tr>
<td>University of Pretoria</td>
<td>PhD</td>
<td>2013</td>
<td>Internal Medicine (College of Medicine)</td>
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B1. Position and Employment:

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<tr>
<th>Date</th>
<th>Position</th>
<th>Institution</th>
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<tbody>
<tr>
<td>2011-present</td>
<td>Department Chair for SACS</td>
<td>Dept. of Small Animal Clinical Services</td>
</tr>
<tr>
<td>2007 – present</td>
<td>Affiliate Research Faculty</td>
<td>Department of Pediatrics, Division of Oncology and Hematology, UF</td>
</tr>
<tr>
<td>2007 – present</td>
<td>Affiliated Research Faculty</td>
<td>Department of Nuclear and Radiological Engineering, College of Engineering, UF</td>
</tr>
<tr>
<td>2010-2011</td>
<td>Associate Department Chair for SACS</td>
<td>Dept. of Small Animal Clinical Services</td>
</tr>
<tr>
<td>July 2009- June 2010</td>
<td>Associate Chief of Staff</td>
<td>Small Animal Hospital, Veterinary Medical Center</td>
</tr>
<tr>
<td>2008 - 2009</td>
<td>Associate Department Chair for Instruction</td>
<td>Dept. of Small Animal Clinical Services</td>
</tr>
<tr>
<td>2007 – 2009</td>
<td>Associate Professor, Service Chief Oncology</td>
<td>Oncology Service, Dept. of Small Animal Clinical Services</td>
</tr>
<tr>
<td>2005–2007</td>
<td>Assistant Professor, Service Chief Oncology</td>
<td>Oncology Service, Dept. of Small Animal Clinical Services</td>
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<tr>
<td>2001-2005</td>
<td>Assistant Professor</td>
<td>Dept. of Small Animal Clinical Sciences</td>
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B2. Professional Memberships:

- American College of Veterinary Internal Medicine 2009
- Editorial Board “Anti-Cancer Drugs” 2006
- Royal College of Veterinary Surgeons 1982-2007
- American Association for Cancer Research 2005
- University of Florida Shands Cancer Center 2003
- American Veterinary Medical Association 2002
- Alachua County (Florida) Veterinary Medical Association 2002
C. PUBLICATIONS: (UF only since 2008)

(r)-residnet (g)-student (f)-fellow


BIOGRAPHICAL SKETCH

NAME
Jonathan G. Li

POSITION TITLE
Clinical Professor

e-common user name

EDUCATION/TRAINING (Begin with undergraduate BA/BS or equivalent. Include postdoctoral training (internship/residency/fellowship, etc.))

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing University, Beijing, China</td>
<td>B.Sc.</td>
<td>1979-1983</td>
<td>Geophysics</td>
</tr>
<tr>
<td>University of Toronto, Canada</td>
<td>Ph.D.</td>
<td>1988-1994</td>
<td>Astrophysics</td>
</tr>
<tr>
<td>Stanford University, Stanford, CA</td>
<td>Postdoc</td>
<td>1998-2000</td>
<td>Medical Physics</td>
</tr>
</tbody>
</table>

A. Certification

American Board of Radiology in Therapeutic Medical Physics (since 2002)

B. Positions and Honors

2000-2007 Assistant Professor, Department of Radiation Oncology, University of Florida, Gainesville, FL

2007-2016 Associate Professor, Department of Radiation Oncology, University of Florida, Gainesville, FL

2011-present Director of Medical Physics Residency Program, Department of Radiation Oncology, University of Florida, Gainesville, FL

2011-present Graduate Faculty, Department of Biomedical Engineering, University of Florida, Gainesville, FL

2015-present Director of Clinical Physics, Department of Radiation Oncology, University of Florida, Gainesville, FL

2016-present Clinical Professor, Department of Radiation Oncology, University of Florida, Gainesville, FL

B. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.


BIOGRAPHICAL SKETCH

NAME
Robert J. AMDUR, MD

POSITION TITLE
Professor

EDUCATION/TRAINING (Begin with undergraduate BA/BS or equivalent. Include postdoctoral training (internship/residency/fellowship, etc.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>University of Florida College of Medicine</td>
<td>M.D</td>
<td>1985</td>
<td>Medicine</td>
</tr>
<tr>
<td>Swarthmore College</td>
<td>B.A</td>
<td>1981</td>
<td>Economics</td>
</tr>
<tr>
<td>Radiobiology (Joel Bedford), Colorado State University</td>
<td>Fellowship</td>
<td>1991</td>
<td>Radiobiology</td>
</tr>
<tr>
<td>Radiation Oncology, University of Florida</td>
<td>Internship and residency</td>
<td>1989</td>
<td>Radiation Oncology</td>
</tr>
</tbody>
</table>

A. Certification

June 1990: American Board of Radiology (Radiation Oncology), ABR Certification #: 33800

2000-present: Enrolled in good-standing in the ABR Maintenance of Certification

October 2015: Cognitive Expertise Written Exam Passed

B. Positions and Honors

1/06 – present | Rodney R. Million Professor of Radiation Oncology | Department of Radiation Oncology | University of Florida College of Medicine

7/02-present | Professor with Tenure | Department of Radiation Oncology | University of Florida College of Medicine | Gainesville, Florida

1/06-11/30/09 | Interim Chair |
Department of Radiation Oncology  
University of Florida College of Medicine  
Gainesville, Florida

6/99-6/02  
Associate Professor  
Department of Radiation Oncology  
University of Florida College of Medicine  
Gainesville, Florida

5/01-present  
Residency Program Director  
Department of Radiation Oncology  
University of Florida College of Medicine  
Gainesville, Florida

B. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.


4. Implementing the Radiation Oncology Milestone Program in the ACGME NAS. Annual ASTRO meeting: October 17, 2015. San Antonio, TX.

5. Thyroid Cancer Tumor Board. 15th International Thyroid Congress. October 23, 2015. Orlando, FL


BIOGRAPHICAL SKETCH

NAME
Clifford Rudd Berry III

POSITION TITLE
Professor

e-common user name berryk

EDUCATION/TRAINING  (Begin with undergraduate BA/BS or equivalent. Include postdoctoral training (internship/residency/fellowship, etc.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
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<tbody>
<tr>
<td>University of Florida</td>
<td>DVM</td>
<td>1980-84</td>
<td>Veterinary Medicine</td>
</tr>
<tr>
<td>UC Davis</td>
<td>Resident</td>
<td>1987-90</td>
<td>Diagnostic Imaging</td>
</tr>
</tbody>
</table>

A. Certification

1990  Diplomate of the American College of Veterinary Radiology (Diagnostic Imaging)

B. Positions and Honors

08/84-6/87  Associate Veterinarian, Oakhurst Animal Hospital, St. Petersburg, FL
07/87-06/90 House Officer (Resident in Veterinary Diagnostic Imaging), UC Davis
08/90-05/91 Assistant Professor, Department of Small Animal Clinical Sciences, CVM, University of Florida, Gainesville, FL
05/91-05/96 Assistant Professor, Department of Physiology, Radiology and Anatomy, CVM, North Carolina State University, Raleigh, NC
05/96-05/01 Associate Professor, Department of Physiology, Radiology and Anatomy, CVM, North Carolina State University, Raleigh, NC
08/09-present Professor, Department of Small Animal Clinical Sciences, CVM, UF, Gainesville, FL

B. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.


BIOGRAPHICAL SKETCH

NAME
Erin G. Porter

POSITION TITLE
Clinical Assistant Professor

e-common user name

EDUCATION/TRAINING (Begin with undergraduate BA/BS or equivalent. Include postdoctoral training (internship/residency/fellowship, etc.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Florida</td>
<td>B.S.</td>
<td>1998-2002</td>
<td>Zoology</td>
</tr>
<tr>
<td>University of Florida</td>
<td>D.V.M. Resident</td>
<td>2003-2007</td>
<td>Veterinary Med</td>
</tr>
<tr>
<td>University of Florida</td>
<td></td>
<td>2010-2013</td>
<td>Radiology</td>
</tr>
</tbody>
</table>

A. Certification

2013 Diplomate of the American College of Veterinary Radiology

B. Positions and Honors

2007-2009 Associate Veterinarian, Orlando Equine Veterinary Care, Orlando, FL
2009-2010 Equine Lameness and Imaging Intern, University of Florida College of Veterinary Medicine, Gainesville, FL
2013-present Clinical Assistant Professor, Department of Veterinary Clinical Sciences, University of Florida College of Veterinary Medicine, Gainesville, FL

C. Awards

American College of Veterinary Radiologists poster competition, 2015, second place: Chapman, KA, Porter, EG, Saunders, FC. Radiographic Anatomy of the Equine Distal Tibia.


D. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.

St. Mary, CM, Gordon, EL, Hale, RE. Environmental effects on egg development and


**Book Chapters**

Course Title: Physics of Radiation Therapy

Instructor: Jonathan Li, PhD

Text: The Physics of Radiation Therapy, 4th edition (Faiz M. Khan)

Time and Place: every Thursdays 7:30 – 9:00 am, from August – February, in resident library.

Intended Audience: radiation oncology residents, first year medical physics residents, QA coordinators, physics assistants.

Homework: weekly homework assignment, due the following Monday.

Course Outline:

1. Atomic and Nuclear Structure
   a. Electron shell structure, electron binding energy
   b. Characteristic x-rays and Auger electron
   c. Nuclear structure and n/p ratio, electron density as function of Z
   d. Isotopes, isotones, isobars, isomers
   e. Nuclear binding energy
   f. Nuclear reaction: fission and fusion

2. Radioactivity and radioactive decay
   a. Decay constant
   b. Half life and mean life
   c. Decay mode:
      i. α-decay
      ii. β-decay (β+ and β- decay)
      iii. Nuclear / isomeric transition, γ-emission and internal conversion

3. X-ray production
   a. Basic components of an x-ray tube
   b. Bremsstrahlung radiation
   c. X-ray spectrum
   d. Beam quality and filtration
   e. X-ray production efficiency
   f. X-ray angular distribution
   g. Focal spot and line focus
   h. X-ray tube operating parameters: tube voltage, filament current, tube current.

4. X-ray interaction
   a. Direct and indirect ionizing radiation
   b. Attenuation coefficient and stopping power
   c. Broad beam and narrow beam geometry
   d. Modes of x-ray interaction with matter
      i. Coherent scattering
      ii. Photoelectric effect
      iii. Compton effect
iv. Pair production
v. photodisintegration

5. Linear accelerators
   a. Basic linac components
   b. Basic principles of monitor chamber
   c. Simple open/wedge field, wedge angle and wedge factor, physical and dynamic wedge

6. Treatment techniques – part I: conventional treatment techniques
   a. Conventional 2D technique, simulators
   b. Blocks and MLC
   c. 3DCRT, conformal arc
   d. IMRT: inverse planning, segmental and dynamic IMRT
   e. IMAT: VMAT, RapidArc

7. Treatment techniques – part II: specialized treatment machines
   a. Elekta Leksell Gamma Knife
   b. NOMOS Peacock
   c. TomoTherapy Hi-Art
   d. FFF (Varian Truebeam, Elekta Versa HD)
   e. Accuray Cyberknife
   f. ViewRay MRIdian
   g. VERO

8. Field matching and gap calculation
   a. Geometric penumbra, transmission penumbra, and dosimetric penumbra
   b. Field matching and gap calculation

9. MU calculation – Part I: basic dosimetric parameters
   a. Inverse square factor
   b. Basic dosimetric parameters: Sc, Sp, Scp, %dd, TMR

10. MU calculation – Part II
    a. Equivalent square fields
    b. MU / dose calculation

11. MU calculation – Part III: inhomogeneity correction
    a. Equivalent (effective) depth, density scaling
    b. Inhomogeneity correction
    c. Kerma, buildup region, charged particle equilibrium (CPE)

12. Exposure and dose
    a. Definition and units of exposure
    b. From exposure to dose to air to dose to medium, $f$ factor
    c. Cavity theory
    d. Linac dose calibration – TG-51

13. Radiation dosimeters
    a. Primary and secondary dosimeters
    b. Calorimeter and chemical dosimeter
    c. Radiographic and radiochromic films
    d. Silicon diodes
e. Detector arrays  
f. Thermoluminescence dosimeter (TLD) and OSLD  
g. Diamond detector, MOSFET, Gel, plastic scintillation  

14. Electron beam therapy – Part I  
a. Differences between Linac photon and electron beam mode  
b. Interaction of electrons with matter  
c. Electron beam PDD: skin dose, dmax, therapeutic range, practical range, x-ray background  
d. Side scatter equilibrium  

15. Electron beam therapy – Part II  
a. Isodose distribution, effect of surface irregularities  
b. Oblique incidence  
c. Extended SSD  
d. Photon and electron beam matching  
e. Virtual source position  
f. Internal shielding and electron backscatter  
g. MU calculation  
h. Total skin electron therapy  
i. Electron arc therapy  

16. Proton beam therapy (including neutron interaction)  
a. Physical properties of protons  
b. Proton interaction with matter  
c. Clinical proton beam production: SOBP, range compensation, scattered vs scanning beams  
d. Treatment techniques  
e. Relative biological effectiveness  
f. Neutron interaction and neutron shielding  

17. Physics equipment demo in treatment room  
a. Linac mechanical check demo  
b. Point measurement using Ion chamber and diode  
c. Detector array and IMRT / VMAT QA  
d. Profile and PDD measurement using 3D water scanner  

18. Linac QA: TG 40, and TG 142  
a. Overview of TG-40 and TG-142  
b. Test parameters and their frequency  
c. Tolerance and action levels  

19. Imaging principles  
a. Basic principle of CT reconstruction  
b. Basic image quality measurement: SNR, CNR, image resolution  
c. CT image artifacts  
d. 4DCT, CBCT, image dose  
e. Different IGRT methods  
f. PET, MRI, ultrasound  
g. DICOM and DICOM-RT standards
20. Radiation protection and shielding design
   a. Dose equivalent and effective dose equivalent
      i. Effective dose equivalent limit
      ii. Radiation protection philosophy
   b. Shielding design
      i. Controlled and non-controlled areas
      ii. Shielding against primary, scattered, and leakage radiation
      iii. Workload, use factor, occupancy factor, distance
   c. Brachytherapy source protection
      i. Source transport
      ii. Leak test
      iii. Patient release
      iv. Distance, time, and shielding
   d. Radiation survey meters
      i. Ion chamber survey meter
      ii. Geiger-Muller (GM) counter
      iii. Neutron rem meter

   a. Brachytherapy source characteristics
   b. Source strength specification, TG-43
   c. Systems of implant rules
   d. LDR vs HDR, permanent vs temporary, hot loading vs after loading

22. Brachytherapy – Part II: applications
   a. GYN application – vaginal cylinder, T&O and T&R, Syed implant
   b. APBI – MammoSite and IntraBeam
   c. Prostate seed implant
   d. Personnel safety in brachytherapy
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>08/18/16</td>
<td>Atomic structure, electron shell structure, nuclear structure, and nuclear reaction</td>
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<td>08/25/16</td>
<td>Radioactivity and radioactive decay</td>
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<tr>
<td>09/01/16</td>
<td>X-ray production</td>
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<td>09/08/16</td>
<td>X-ray interaction</td>
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<tr>
<td>09/15/16</td>
<td>Linac head description, ion chamber basics, wedges, blocks and MLC, MU/Dose</td>
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<td>09/22/16</td>
<td>Open/wedge field isodose curves, 2-field, 3-field, 4-field characteristics, treatment techniques</td>
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<td>09/29/16</td>
<td>ASTRO Week</td>
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<td>10/06/16</td>
<td>Treatment technique, part 2</td>
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<td>10/13/16</td>
<td>Field matching and gap calculation</td>
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<td>Basic dosimetric parameters 1: PDD, TMR, Sc, Sp, inverse square, and MU calculation</td>
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<td>Basic dosimetric parameters 2: PDD, TMR, Sc, Sp, and MU calculation, part 2</td>
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<td>11/03/16</td>
<td>Basic dosimetric parameters 3: heterogeneity correction, electronic equilibrium</td>
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<td>11/10/16</td>
<td>Exposure and dose, Linac calibration with TG-51</td>
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<td>Dosimeters: ionization chamber, film, diode, TLD. Primary and secondary dosimeters.</td>
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<td>12/01/16</td>
<td>Electron beam therapy</td>
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<tr>
<td>12/08/16</td>
<td>Electron beam therapy, part 2</td>
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<td>12/15/16</td>
<td>Proton therapy - including neutron interaction</td>
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<tr>
<td>12/22/16</td>
<td>Christmas / New Year</td>
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<tr>
<td>12/29/16</td>
<td>Christmas / New Year</td>
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<td>01/05/17</td>
<td>QA demo on the machine, physics equipment, machine QA, patient specific IMRT QA</td>
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<td>01/12/17</td>
<td>Linac QA: TG 40 and TG 142</td>
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<td>Imaging principles: CT, 4DCT, MRI, PET.</td>
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<td>01/26/17</td>
<td>Radiation Protection and Shielding design</td>
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<td>02/02/17</td>
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<td>02/09/17</td>
<td>Brachytherapy - part 2</td>
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<td>Lecture Topic</td>
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<tr>
<td>1. Interaction of Radiation with Matter (Chapter 1)</td>
<td>April 5 (Tuesday)</td>
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<tr>
<td>DNA and Chromosome Damage and Repair (Chapter 2)</td>
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<td>2. Cell Survival Curves (Chapters 3 and 23)</td>
<td>April 7</td>
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<td>3. Linear Energy Transfer</td>
<td>April 14</td>
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<td>Relative Biological Effectiveness (Chapter 7)</td>
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<td>4. Cell Sensitivity Through the Cell Cycle (Chapter 4)</td>
<td>April 19 (Tuesday)</td>
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<tr>
<td>Cell Cycle Molecular Events (Chapter 22)</td>
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<td>5. Oxygen Effect, Reoxygenation (Chapter 6)</td>
<td>April 21</td>
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<tr>
<td>Angiogenesis (Chapter 18, pg 290-291)</td>
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<tr>
<td>Predictive Assays</td>
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<td>6. Tumor Kinetics (Chapter 22, pg 372-388)</td>
<td>April 28</td>
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<tr>
<td>Dose Rate Effect and Repair of Damage (Chapter 5)</td>
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<td>7. Radiosensitizers, Protectors and Hyperthermia (Chapters 9, 26, 28)</td>
<td>May 5</td>
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<td>Chemotherapy Agents/New Modalities (Chapters 25, 27)</td>
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<td>Tumor Tissues (Chapter 21)</td>
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<td>9. Acute Effects of Whole-body Irradiation (Chapter 8)</td>
<td>May 19</td>
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<tr>
<td>Effects of Radiation on the Embryo and Fetus (Chapter 12)</td>
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<td>10. Genetic and Somatic Effects from Radiation (Chapters 11, 13)</td>
<td>May 26</td>
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<tr>
<td>12. Cancer/Molecular Biology (Chapter 18)</td>
<td>June 9</td>
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<tr>
<td>13. Overall review</td>
<td>June 16</td>
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Radiobiology for the Radiologist, E.J. Hall and A.J. Giaccia, 7th Ed

Thursday sessions are from 7:30-8:30 am (Eastern Time) and Tuesday sessions are from 3:00-4:00 pm (Eastern Time).
Radiation Oncology Service Summary VMTH Resident Evaluation

The purpose of this document is to open and improve communications between the resident, the program coordinator, and the faculty members within the specialty service and to outline constructive methods to help, not hinder, the resident toward positive progress in the specialty training program.

This evaluation must be completed every June and December by the resident's specialty committee, discussed with the resident, and then signed by the involved individuals. The original will be kept by the resident's program coordinator, the resident will get one copy and one copy will be sent to the Residency Committee Chairperson by January 1 and July 1 of each year to be kept in a confidential file.

The evaluation categories have been scored, based upon direct input from the resident's specialty faculty members, as Excellent = 1, Good = 2, Satisfactory = 3, Needs Improvement = 4, and Unsatisfactory = 5; categories which were not scored are identified by not applicable NA.

### Name

### Specialty/Term

### Program Coordinators

### Date Residency Began

<table>
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<tr>
<th>Professional Ability</th>
<th>PREV</th>
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<tbody>
<tr>
<td>Theoretical Knowledge</td>
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<td>Application of Knowledge</td>
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<td>Accuracy of Knowledge</td>
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<td>Clinical skills</td>
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<td>Ability to make independent decisions</td>
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<tr>
<td>Contributions to student education</td>
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<tr>
<td>Pretreatment evaluation (staging tests)</td>
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<tr>
<td>Development of computerized treatment plan (3DCRT, IMRT)</td>
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<tr>
<td>Development of manual setup plan</td>
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<tr>
<td>Set-up of patients in positioning device for CT and RT planning</td>
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<td>Ongoing primary case management</td>
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<tr>
<td>Assessment of tumor and normal tissue response (acute side effects management)</td>
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<tr>
<td>Portal/CBCT (cone beam CT) imaging assessment</td>
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## Progress Toward Boards

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<tr>
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<tr>
<td>Independent Study</td>
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<td>Awareness of Current Literature</td>
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<td>Attendance at Seminars and Rounds</td>
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<td>Presentations at Seminars and Rounds</td>
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<td>Progress in Resident Project</td>
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<td>Publications</td>
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## Personal Characteristics

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<tr>
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<tr>
<td>Oncology Clinician/resident comm.</td>
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<tr>
<td>Quality of other faculty interactions</td>
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<td>Quality of resident interactions</td>
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<td>Quality of intern interactions</td>
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<td>Quality of student interactions</td>
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<td>Quality of staff interactions</td>
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<tr>
<td>Independence and initiative</td>
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<td>Maturity</td>
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<td>Motivation</td>
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<td>Attitude and enthusiasm</td>
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<td>Leadership qualities</td>
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## Hospital Service

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<tr>
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<tbody>
<tr>
<td>Current Remarks</td>
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<tr>
<td>Previous Remarks</td>
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Miscellaneous Comments and Constructive Suggestions for Improvement:

Current Remarks:
Previous Remarks:

We have discussed the above evaluation with the resident and are aware that this is our opinion, but feel that it is fair and accurate.

______________________ __________
Program Coordinator Date

My residency committee has discussed this evaluation with me.
θ I feel this is a fair and accurate evaluation.
θ I feel this is an unfair and inaccurate evaluation.

_______________________________________________________ ________________________
Resident Signature Date