BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Roa, Dante E.	Clinical Professor
eRA COMMONS USER NAME	

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Yale University – School of Medicine	Fellowship	01/03	Radiation Oncology Physics
Argonne National Laboratory	Postdoctoral	98/01	Diagnostic Nuclear Medicine
Florida State University	PhD	05/97	Experimental Nuclear Physics
Florida State University	MS	05/94	Physics
King College	BS	05/89	Physics

A. Personal Statement

My primary interest is to fully utilize the latest technology in radiation therapy available at UC Irvine to deliver the most efficient and effective treatment to a patient. For this purpose, I have worked in the implementation and dosimetric validation of a volumetric-modulated arc therapy (VMAT) treatment technique for SRS/SBRT treatments; have performed fetal dose measurements outside a VMAT treatment field using an anthropomorphic phantom to assess dose risks to a patient fetal region; have investigated the effects on cognition after a high dose (10Gy) irradiation to the whole brain and single hippocampus of athymic nude rats using a high-precision VMAT technique.
In addition to this work, I have given numerous presentations and webinars on the use of VMAT highlighting my experience working with it and its efficacy.
Furthermore, I teach physics to radiation oncology (MDs) and medical physics residents (PhDs), which is always a rewarding and stimulating experience since this group brings a clinical perspective which often differs from the analytical approach that characterizes the physics field. This is the synergy that I embrace and pursue.

B. Positions and Honors

Positions and Employment

1997 – 2001 Postdoctoral Associate – Argonne National Laboratory, Advanced Photon Source Division
2001 – 2003 Postdoctoral Fellow in Rad. Onc. Physics – Yale University School of Medicine
2003 – 2009 Assistant Clinical Professor – Department of Radiation Oncology – UC Irvine
2005 – Medical Dosimetry Program, Co-Director - Department of Radiation Oncology – UC Irvine
2009 – 2015 Associate Clinical Professor – Department of Radiation Oncology – UC Irvine
2015 – Clinical Professor – Department of Radiation Oncology – UC Irvine

Other Experience and Professional Membership

2000 – 02 Member, Society of Optical Engineering - SPIE.
1990 – Member, American Physical Society - APS.
2001 – Member, American Association of Physicists in Medicine – AAPM
2004 – Member, Southern California Chapter of the AAPM
2006 – Scientific reviewer, Journal of Medical Physics
2006 – Scientific reviewer, Journal of Medical Dosimetry
2009 – Member, American Society for Therapeutic Radiology and Oncology – ASTRO
2013 The Abdus Salam International Center for Theoretical Physics – Radiotherapy Course – Invited Faculty
2014 – 15 ASTRO Refresher Course – Invited Faculty

2014 – Member, Asociacion Latinoamreicana de Terapia Radiante Oncologica – ALATRO
2014 – ANL-MD Anderson-IAEA – Radiotherapy Courses – Invited Faculty

Honors

1998 Tennessee Eastmann Scholarship, King College, Bristol, TN
1989 NSF Summer Research Fellowship, Florida State University, Tallahassee, FL
1990 DOE/ANL Summer Research Fellowship, Argonne National Laboratory, Argonne, IL
1992 – 96 DOE/ANL Graduate Student Assistantship, Argonne National Laboratory, Argonne, IL
2009 – Consultant, Varian Medical Systems, Palo Alto, CA

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

1. Smither RK and **Roa DE**. Crystal diffraction lens for medical imaging. Progress in Biomedical Optics and Imaging. Proceedings of SPIE Vol 3977: 342-352, 2000.

2. Smither RK and **Roa DE**. The Physics of Medical Imaging with Crystal Diffraction Lenses. Progress in Biomedical Optics and Imaging. Proceedings of SPIE Vol 4320: 447-458, 2001.

3. **Roa DE** and Smither RK. Copper Crystal Lens for Medical Imaging: First Results. Progress in Biomedical Optics and Imaging. Proceedings of SPIE Vol 4320: 435-446, 2001.

4. Nath R, Yue N, **Roa E.** Experimental Determination of Dosimetric Characterization of a Newly Designed Encapsulated Interstitial Brachytherapy Source of ^{203}Pd – Nodel Pd-1 BrachySeed^{TM}. Med Phys 29: 2433-2434, 2002.

5. **Roa DE**, Song H, Yue N, d'Errico F and Nath R. Dosimetric characteristics of the Novoste Beta-Cath Sr/Y-90 source trains at sub-millimeter distances. Med. Phys. 31: 1269-1276, 2004.

6. **Roa DE**, Smither RK, Zhang X, Nie K, Shieh YY, Ramsinghani N, Milne N, Kuo JV, Redpath JL, Al-Ghazi MSAL, Caligiuri P. Development of a new photon diffraction imaging system for diagnostic nuclear medicine. Exp. Astron. DOI 10.1007/s10686-005-9017-y (2006).

7. Smither RK, Khaliefeh AS, **Roa DE**, Beno M, von Ballmoos P, Skinner G. High diffraction efficiency, broadband, diffraction crystals for use in crystal diffraction lenses. Exp. Astron. DOI 10.1007/s10686-005-9019-9 (2006).

8. **Roa DE**, Smither RK, Shieh YY, Nie K, Zhang X, Al-Ghazi MSAL, Milne N, Caligiuri P. Development of a High Resolution Imaging System for Nuclear Medicine. Med. Phys. Vol. 33, 6, p2278, (2006).

9. Workie D, Sehgal V, **Roa DE**, Al-Ghazi MSAL, Kuo JV, Ramsinghani NS. Evaluation of Two CT/MRI Fusion Algorithms Used for Treatment Planning. Med. Phys. Vol. 33, 6, p2034, (2006).

10. **Roa DE**, Song H, Ahmad M, He Q, Al-Ghazi M. In-Vivo Dosimetry Verification of a 3D Treatment Plan Prescription Dose at a Depth Beyond Dmax Using Diodes. Med. Phys. Vol. 34, 6, p2461, (2007).

11. Song H, **Roa DE**, Ahmad M, Luo W, Yin F, Chen Z. Using Diode Dosimeters to Characterize Dose in the Buildup Region of High-Energy Photon Beams. Med. Phys. Vol 34, 6, p2502, (2007).

12. **D.E. Roa**, R. Chung, N.S. Ramsinghani and M.S.A.L. Al-Ghazi, Simultaneous Boost and Skin Dose Toxicity Reduction for Breast Cancer Treatments using IMRT and RapidArc. Med. Phys. Vol. 36, p2543, (2009).

13. J. Zhang, G. VanDerbeck, S. Dietrich, D. Schiffner, J. Wong, J. Kuo, N. Ramsinghani, M. Al-Ghazi and **D. Roa,** Comprehensive RapidArc™ treatment planning and quality assurance for head and neck cancers. Med. Phys. Vol. 37, p3209, (2010).

14. J. Zhang, V. Sehgal, **D. Roa**, Q. He, M. Martin, M. Al-Ghazi, Comprehensive clinical commissioning and quality assurance procedures of a big bore CT simulator in a radiation oncology department. Med. Phys. Vol. 37, p3152, (2010).

15. D. Roa, G. VanDerbeck, J. Zhang, D. Schiffner, J. Wong, J. Kuo, N. Ramsinghani and M. Al-Ghazi, Special radiation treatment procedures using RapidArc™. Med. Phys. Vol. 37, p. 3220, (2010).

16. Fife D, Rayhan DJ, Behnam S, Ortiz A, Elkeeb L, Aquino L, **Roa DE**, Ramsinghani N, Kuo J, Newcomb R, Zachary CB, Kelly KM., A randomized, controlled, double-blind study of light emitting diode photomodulation for the prevention of radiation dermatitis in patients with breast cancer. Dermatol Surg. 2010 Dec;36(12):1921-7. doi: 10.1111/j.1524-4725.2010.01801.x. Epub 2010 Nov 11 (2011).

17. Acharya MM, **Roa DE**, Bosch O, Lan ML, Limoli CL, Stem cell transplantation strategies for the restoration of cognitive dysfunction caused by cranial radiotherapy, J Vis Exp. 2011 Oct 18;(56). pii: 3107. doi: 10.3791/3107 (2011).

18. **Roa DE**, Schiffner DC, Zhang J, Dietrich SN, Kuo JV, Wong J, Ramsinghani NS, Al-Ghazi MS., The use of RapidArc volumetric-modulated arc therapy to deliver stereotactic radiosurgery and stereotactic radiotherapy to intracranial and extranial targets. Med. Dosim. 37, 257 (2012).

19. **Roa DE**, Schiffner DC, Zhang J, Dietrich SN, Kuo JV, Wong J, Ramsinghani NS, Al-Ghazi MS., Radiocirugia Estereotactica y Radioterapia Corporal Estereotactica usando VMAT – RapidArc. Revista ALFIM, Vol 1, 3, p3, June 2012.

20. Parihar VK, Acharya MM, **Roa DE**, Bosch O, Christie LA, Limoli CL, Defining functional changes in the brain caused by targeted stereotaxic radiosurgery, Transl. Cancer Res. April 1; 3(2): 124–137, 2014

21. **Roa D**, Lin Y, Hanna N, Al-Ghazi M, Kuo J, Dosis fetal de un tratamiento de cabeza-y-cuello usando VMAT-RapidArc: Estudio usando un fantoma antropomorfico, Revista ALFIM 2014 (in press)

D. Research Support

Completed Research Support

IRG-98-279-04 Roa (PI) 02/01/2005 – 01/31/2006
American Cancer Society
Overall sensitivity assessment via Monte Carlo calculations of a new high spatial resolution cancer imaging system for nuclear medicine and molecular imaging
The goal of this project was to determine the efficiency and sensitivity of a photon diffraction imaging system for detecting 1-2mm tumors using computer simulations.
Role: PI

School of Medicine – College of Medicine on Research and Graduate Academic Programs

Roa (PI) 2006/2007 Fiscal Year $10,000.00
Efficiency Assessment of a High Spatial Resolution Imaging System for Nuclear Medicine using Monte Carlo Simulations
This project is a continuation of the work that started under the support the support of the American Cancer Society grant described above.
Role: PI