

JESSICA C. RAMELLA-ROMAN, PhD

CURRICULUM VITAE

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Name:

Jessica Ramella-Roman

Address:

Department of Biomedical Engineering

and Herbert Wertheim College of Medicine

Department of Cellular Biology and Pharmacology

Department of Ophthalmology

Florida International University

Office: AHC4 Room 330, MMC Campus

Laboratory: Viertes Haus # 333, 11110 SW 11th St Miami, FL 33174

EDUCATION

Ph.D. Electrical Engineering, January 2004.

Oregon Health and Science University, Portland, OR,

Advisor: Steve Jacques

M.S. Electrical Engineering, January 2004.

Oregon Health and Science University, Portland, OR

Laura Electrical Engineering, July 1993.

Universita' di Pavia, Pavia, Italy

Academic Appointments:

1993-1995 Research and Development, CET Control Systems, Novara, Italy

1995-1997 Engineer, Submicron Systems Corp., Milan Italy

1995-1998 Site Manager, Semitool Inc., Catania, Italy

1999-2004 Graduate Research Assistant, Oregon Medical Laser Center, Portland, OR.

2004-2005 Postdoctoral Fellow, Applied Physics Laboratory, Johns Hopkins University,

Baltimore, MD.

- 2005-2010 Assistant Professor, The Catholic University of America, Washington, DC.
- 2008-present Adjunct Assistant Professor, Johns Hopkins University School of Medicine, Baltimore, MD.
- 2009-present Senior Research Scientist, National Rehabilitation Hospital, Washington, DC.
- 2010-2013 Associated Professor (Tenured), The Catholic University of America, Washington, DC
- 2012-2013 Visiting Associate Professor Johns Hopkins University (Sabbatical).
- 2013-present Associated Professor (Tenured), Department of Biomedical Engineering, Florida International University, Miami, FL.
- 2013-present Associated Research Professor, Herbert Wertheim College of Medicine, Cellular Biology and Pharmacology and Ophthalmology
- 2014-2015 Graduate Program Director, Department of Biomedical Engineering, Florida International University, Miami, FL.

HONORS

2018 - Fellow of SPIE

2017 - Senior Member of SPIE

2011 - Kaman Award for Excellence in Research, The Catholic University of America.

2010 - Kaman Award for Excellence in Teaching, The Catholic University of America.

2008 - Provost Award for Excellence in Research and Scholarship, The Catholic University of America.

2004 - APL Postdoctoral Fellowship Engineering Program.

2003 - Paul Clayton Student Achievement Award.

LANGUAGES

Italian, English, French

PROFESSIONAL MEMBERSHIPS

- Chair Poincaré Webinar Series, (2020 – present)

- SPIE BIOS Program Track Chair, Tissue Optics, Laser-Tissue Interaction, and Tissue Engineering (2019 - present)

- Editorial Board, Journal of Biomedical Optics (2018-present)
- OSA BIOMED 2020 Organizing committee
- OSA BIOMED 2020 Presider for Skin II Session and Women Health I Session.
- Biophotonics and Optical Momentum BIOAMS 2018, Paris, Scientific Advisory Board (2018)
- Organizing Committee Member, CLEO Annual Meeting. (2010-Present)
- Program Committee Member and Session Chair, Photonics in Dermatology and Plastic Surgery, Photonics West SPIE, San Francisco, CA. (2010-Present)
- Program Committee Member and Session Chair, Optical Interactions with tissue and cells XVIII, Photonics West SPIE, San Francisco, CA. (2010- Present)
- Reviewer Wellcome Trust (2016)
- Editorial Board Member, Polarized Light Special Issue, Journal of Biomedical Optics (2015-2016)
- Panelist at SPIE BIOS conference San Francisco (Panel Discussion: Panel Discussion on Speckle in Biomedical Optics) (2016)
- Guest Editor of Biomedical Optics Express, special issue dedicated to Phantoms for the Performance Evaluation and Validation of Optical Medical Imaging Devices (2012)
- Panelist at SPIE BIOS conference San Francisco (Panel Discussion: 3D and 4D microcirculation imaging: Where Will the Clinical Impact Be?) (2012)
- Chair and Organizer of Optical Phantom NIST-Workshop, Catholic University of America (2011)
- Chair and Organizer of Optical Phantom Short Course, Catholic University of America (2011)
- Chair of the Organizing Committee for Metropolitan Biophotonics Symposium, Washington, DC. (2009, 2010, 2011, 2012,2013,2014)
- Organizing Committee Member, IEEE LEOS Annual Meeting, Biophotonics. (2008, 2009,2010, 2011, 2012)
- Organizing Committee Member 1st International Biophotonics Meeting in Israel Tel Aviv University, Tel Aviv, Israel (2012)
- Panelist for the Southern Biomedical Engineering Career Conference, Translational Research Section, Washington, DC. (2009)
- Program Committee Member, Inter-Institute Workshop on Optical Diagnostic and Biophotonic Methods from Bench to Bedside, Bethesda, MD. (2009, 2010, 2011)
- Grant Reviewer for the Israel Science Foundation, Israel. (2009, 2010)
- Grant Reviewer for the Material Command, Congressionally Directed Medical Research Program (CDMRP). (2008)

- Organizing Committee Member, IEEE Advances in Nanobiophotonics Conference, Mexico. (2008)
- Referee, American Society of Mechanical Engineers Proceedings.
- Referee, Applied Optics.
- Referee, Journal of Biomedical Optics.
- Referee, IEEE J. of Selected Topics in Quantum Electronics.
- Referee, Optics Express.
- Referee, BioMedical Engineering OnLine.
- Referee, Journal of Physics D: Applied Physics.
- Grant Reviewer for the Agency for Science, Technology and Research's (A*STAR) Biomedical Research Council (BMRC), Singapore.
- Member of the International Society for Optical Engineering.
- Member of the Johns Hopkins University Postdoctoral Association.
- Member of the Italian Professional Engineer Association.

PEER REVIEWED JOURNALS

1. S. L. Jacques, J. R. Roman, K. Lee, Imaging superficial tissues with polarized light. *Laser Surg Med* **26**, 119-129 (2000).
2. S. L. Jacques, J. C. Ramella-Roman, Imaging skin with a polarized light video camera. *Laser Surg Med*, 69-70 (2002).
3. S. L. Jacques, J. C. Ramella-Roman, K. Lee, Imaging skin pathology with polarized light. *J Biomed Opt* **7**, 329-340 (2002).
4. J. C. Ramella-Roman, P. R. Bargo, S. A. Pahl, S. L. Jacques, Evaluation of spherical particle sizes with an asymmetric illumination microscope. *Ieee J Sel Top Quant* **9**, 301-306 (2003).
5. J. C. Ramella-Roman, K. Lee, S. A. Pahl, S. L. Jacques, Design, testing, and clinical studies of a handheld polarized light camera. *J Biomed Opt* **9**, 1305-1310 (2004).
6. J. Ramella-Roman, S. Pahl, S. Jacques, Three Monte Carlo programs of polarized light transport into scattering media: part I. *Opt Express* **13**, 4420-4438 (2005).
7. J. C. Ramella-Roman, S. A. Pahl, S. L. Jacques, Three Monte Carlo programs of polarized light transport into scattering media: part II. *Opt Express* **13**, 10392-10405 (2005).
8. B. Boulbry, J. C. Ramella-Roman, T. A. Germer, Improved method for calibrating a Stokes polarimeter. *Appl Optics* **46**, 8533-8541 (2007).
9. J. C. Ramella-Roman, S. A. Mathews, Spectroscopic measurements of oxygen saturation in the retina. *Ieee J Sel Top Quant* **13**, 1697-1703 (2007).
10. J. C. Ramella-Roman, Polarized light transport into scattering media using a quaternion-based Monte Carlo. *Nato Sci Peace Sec B*, 229-241 (2008).

11. J. C. Ramella-Roman, Out of plane polarimetric imaging of skin: Surface and subsurface effect. *Nato Sci Peace Sec B*, 259-269 (2008).
12. J. C. Ramella-Roman, S. A. Mathews, H. Kandimalla, A. Nabili, D. D. Duncan, S. A. D'Anna, S. M. Shah, Q. D. Nguyen, Measurement of oxygen saturation in the retina with a spectroscopic sensitive multi aperture camera. *Opt Express* **16**, 6170-6182 (2008).
13. P. Lemaillet, J. C. Ramella-Roman, Dynamic eye phantom for retinal oximetry measurements. *J Biomed Opt* **14**, (2009).
14. J. Ramella-Roman, M. Nabili, A. Libin, M. Spungen, E. Woods, S. Groah, Use of a Multi-Aperture Spectral Camera for the Assessment of Skin Wound Healing. *Laser Surg Med*, 19-19 (2009).
15. A. Basiri, M. Nabili, S. Mathews, A. Libin, S. Groah, H. J. Noordmans, J. C. Ramella-Roman, Use of a multi-spectral camera in the characterization of skin wounds. *Opt Express* **18**, 3244-3257 (2010).
16. D. D. Duncan, P. Lemaillet, M. Ibrahim, Q. D. Nguyen, M. Hiller, J. Ramella-Roman, Absolute blood velocity measured with a modified fundus camera. *J Biomed Opt* **15**, (2010).
17. A. D. Jaskille, J. C. Ramella-Roman, J. W. Shupp, M. H. Jordan, J. C. Jeng, Critical Review of Burn Depth Assessment Techniques: Part II. Review of Laser Doppler Technology. *J Burn Care Res* **31**, 151-157 (2010).
18. P. Lemaillet, D. D. Duncan, A. Lompado, M. Ibrahim, Q. D. Nguyen, J. C. Ramella-Roman, Retinal Spectral Imaging and Blood Flow Measurement. *J Innov Opt Heal Sci* **3**, 255-265 (2010).
19. C. Weinand, A. Nabili, M. Khumar, J. R. Dunn, J. Ramella-Roman, J. C. Jeng, M. H. Jordan, Y. Tabata, Factors of Osteogenesis Influencing Various Human Stem Cells on Third-Generation Gelatin/beta-Tricalcium Phosphate Scaffold Material. *Rejuv Res* **14**, 185-194 (2011).
20. A. Basiri, D. L. Edelstein, J. Graham, A. Nabili, F. M. Giardiello, J. C. Ramella-Roman, Detection of familial adenomatous polyposis with orthogonal polarized spectroscopy of the oral mucosa vasculature. *J Biophotonics* **4**, 707-714 (2011).
21. D. L. Edelstein, F. M. Giardiello, A. Basiri, L. M. Hylind, K. Romans, J. E. Axilbund, M. Cruz-Correa, J. C. Ramella-Roman, A new phenotypic manifestation of familial adenomatous polyposis. *Fam Cancer* **10**, 309-313 (2011).
22. S. L. Groah, A. Libin, M. Spungen, K. L. Nguyen, E. Woods, M. Nabili, J. Ramella-Roman, D. Barritault, Regenerating matrix-based therapy for chronic wound healing: a prospective within-subject pilot study. *Int Wound J* **8**, 85-95 (2011).
23. J. C. Ramella-Roman, A. Nayak, S. A. Pahl, Spectroscopic sensitive polarimeter for biomedical applications. *J Biomed Opt* **16**, (2011).
24. P. Ghassemi, P. Lemaillet, T. A. Germer, J. W. Shupp, S. S. Venna, M. E. Boisvert, K. E. Flanagan, M. H. Jordan, J. C. Ramella-Roman, Out-of-plane Stokes imaging polarimeter for early skin cancer diagnosis. *J Biomed Opt* **17**, (2012).

25. J. Hwang, J. C. Ramella-Roman, R. Nordstrom, Introduction: Feature Issue on Phantoms for the Performance Evaluation and Validation of Optical Medical Imaging Devices. *Biomed Opt Express* **3**, 1399-1403 (2012).
26. L. Luu, P. A. Roman, S. A. Mathews, J. C. Ramella-Roman, Microfluidics based phantoms of superficial vascular network. *Biomed Opt Express* **3**, 1350-1364 (2012).
27. T. T. Nguyen, H. N. Le, M. Vo, Z. Wang, L. Luu, J. C. Ramella-Roman, Three-dimensional phantoms for curvature correction in spatial frequency domain imaging. *Biomed Opt Express* **3**, 1200-1214 (2012).
28. T. T. A. Nguyen, J. W. Shupp, L. T. Moffatt, M. H. Jordan, E. J. Leto, J. C. Ramella-Roman, Assessment of the Pathophysiology of Injured Tissue With an In Vivo Electrical Injury Model. *Ieee J Sel Top Quant* **18**, 1403-1411 (2012).
29. J. W. Shupp, L. T. Moffatt, T. Nguyen, J. C. Ramella-Roman, R. Hammamieh, S. A. Miller, E. J. Leto, D. Y. Jo, P. R. Randad, M. Jett, J. C. Jeng, M. H. Jordan, Examination of Local and Systemic In Vivo Responses to Electrical Injury Using an Electrical Burn Delivery System. *J Burn Care Res* **33**, 118-129 (2012).
30. Q. Wang, D. Le, J. Ramella-Roman, J. Pfefer, Broadband ultraviolet-visible optical property measurement in layered turbid media. *Biomed Opt Express* **3**, 1226-1240 (2012).
31. D. V. N. Le, Q. Z. Wang, J. C. Ramella-Roman, T. J. Pfefer, Monte Carlo modeling of light-tissue interactions in narrow band imaging. *J Biomed Opt* **18**, (2013).
32. X. Liu, Y. Huang, J. C. Ramella-Roman, S. A. Mathews, J. U. Kang, Quantitative transverse flow measurement using optical coherence tomography speckle decorrelation analysis. *Opt Lett* **38**, 805-807 (2013).
33. X. Liu, J. C. Ramella-Roman, Y. Huang, Y. Guo, J. U. Kang, Robust spectral-domain optical coherence tomography speckle model and its cross-correlation coefficient analysis. *J Opt Soc Am A* **30**, 51-59 (2013).
34. T. T. A. Nguyen, J. C. Ramella-Roman, L. T. Moffatt, R. T. Ortiz, M. H. Jordan, J. W. Shupp, Novel Application of a Spatial Frequency Domain Imaging System to Determine Signature Spectral Differences Between Infected and Noninfected Burn Wounds. *J Burn Care Res* **34**, 44-50 (2013).
35. M. Aloraefy, T. J. Pfefer, J. C. Ramella-Roman, K. E. Sapsford, In Vitro Evaluation of Fluorescence Glucose Biosensor Response. *Sensors-Basel* **14**, 12127-12148 (2014).
36. V. N. Du Le, Q. Wang, T. Gould, J. C. Ramella-Roman, T. J. Pfefer, Vascular contrast in narrow-band and white light imaging. *Appl Opt* **53**, 4061-4071 (2014).
37. P. Ghassemi, T. E. Travis, L. T. Moffatt, J. W. Shupp, J. C. Ramella-Roman, A polarized multispectral imaging system for quantitative assessment of hypertrophic scars. *Biomed Opt Express* **5**, 3337-3354 (2014).
38. J. Wang, J. Coburn, C. P. Liang, N. Woolsey, J. C. Ramella-Roman, Y. Chen, T. J. Pfefer, Three-dimensional printing of tissue phantoms for biophotonic imaging. *Opt Lett* **39**, 3010-3013 (2014).
39. A. Alkhalil, S. Tejiram, T. E. Travis, N. J. Prindeze, B. C. Carney, L. T. Moffatt, L. S. Johnson, J. Ramella-Roman, J. W. Shupp, A Translational Animal Model for Scar

- Compression Therapy Using an Automated Pressure Delivery System. *Eplasty* **15**, e29 (2015).
40. P. Ghassemi, J. W. Shupp, T. E. Travis, A. J. Gravunder, L. T. Moffatt, J. C. Ramella-Roman, A portable automatic pressure delivery system for scar compression therapy in large animals. *Rev Sci Instrum* **86**, (2015).
 41. P. Ghassemi, J. Wang, A. J. Melchiorri, J. C. Ramella-Roman, S. A. Mathews, J. C. Coburn, B. S. Sorg, Y. Chen, T. J. Pfefer, Rapid prototyping of biomimetic vascular phantoms for hyperspectral reflectance imaging. *J Biomed Opt* **20**, 121312 (2015).
 42. M. A. Ibrahim, R. E. Annam, Y. J. Sepah, L. Luu, M. G. Bittencourt, H. S. Jang, P. Lemailet, B. Munoz, D. D. Duncan, S. West, Q. D. Nguyen, J. C. Ramella-Roman, Assessment of oxygen saturation in retinal vessels of normal subjects and diabetic patients with and without retinopathy using Flow Oximetry System. *Quant Imaging Med Su* **5**, 86-96 (2015).
 43. D. W. Paul, P. Ghassemi, J. C. Ramella-Roman, N. J. Prindeze, L. T. Moffatt, A. Alkhalil, J. W. Shupp, Noninvasive imaging technologies for cutaneous wound assessment: A review. *Wound Repair Regen* **23**, 149-162 (2015).
 44. T. E. Travis, P. Ghassemi, J. C. Ramella-Roman, N. J. Prindeze, D. W. Paul, L. T. Moffatt, M. H. Jordan, J. W. Shupp, A Multimodal Assessment of Melanin and Melanocyte Activity in Abnormally Pigmented Hypertrophic Scar. *J Burn Care Res* **36**, 77-86 (2015).
 45. T. E. Travis, M. J. Mino, L. T. Moffatt, N. A. Mauskar, N. J. Prindeze, P. Ghassemi, J. C. Ramella-Roman, M. H. Jordan, J. W. Shupp, Biphasic Presence of Fibrocytes in a Porcine Hypertrophic Scar Model. *J Burn Care Res* **36**, E125-E135 (2015).
 46. A. Alkhalil, S. Muhie, B. Carney, T. E. Travis, L. Moffatt, L. Johnson, J. Ramella-Roman, J. Shupp, Transcriptome profiles of porcine skin dyschromia after wound injury. *Faseb J* **30**, (2016).
 47. J. Chue-Sang, Y. Bai, S. Stoff, D. Straton, S. Ramaswamy, J. C. Ramella-Roman, Use of combined polarization-sensitive optical coherence tomography and Mueller matrix imaging for the polarimetric characterization of excised biological tissue. *J Biomed Opt* **21**, 71109 (2016).
 48. P. Ghassemi, L. T. Moffatt, J. W. Shupp, J. C. Ramella-Roman, A new approach for optical assessment of directional anisotropy in turbid media. *J Biophotonics* **9**, 100-108 (2016).
 49. T. Novikova, I. Meglinski, J. C. Ramella-Roman, V. V. Tuchin, Special Section Guest Editorial: Polarized Light for Biomedical Applications. *J Biomed Opt* **21**, 71001 (2016).
 50. K. Rincon, P. Shah, J. Ramella-Roman, S. Bhansali, A Review of Engineering Approaches for Lymphedema Detection. *IEEE Rev Biomed Eng* **9**, 79-90 (2016).
 51. D. A. Rodriguez, T. J. Pfefer, Q. Wang, P. F. Lopez, J. C. Ramella-Roman, A Monte Carlo Analysis of Error Associated With Two-Wavelength Algorithms for Retinal Oximetry. *Invest Ophthalmol Vis Sci* **57**, 6474-6481 (2016).
 52. B. C. Carney, Z. Liu, A. Alkhalil, T. E. Travis, J. Ramella-Roman, L. T. Moffatt, J. W. Shupp, Elastin Is Differentially Regulated by Pressure Therapy in a Porcine Model of Hypertrophic Scar. *J Burn Care Res* **38**, 28-35 (2017).

53. J. Chue-Sang, Y. Bai, S. Stoff, M. Gonzalez, N. Holness, J. Gomes, R. Jung, A. Gandjbakhche, V. V. Chernomordik, J. C. Ramella-Roman, Use of Mueller matrix polarimetry and optical coherence tomography in the characterization of cervical collagen anisotropy. *J Biomed Opt* **22**, 1-9 (2017).
54. Y. Song, S. Garcia, Y. Frometa, J. C. Ramella-Roman, M. Soltani, M. Almadi, J. J. Riera, W. C. Lin, Quantitative assessment of hemodynamic and structural characteristics of in vivo brain tissue using total diffuse reflectance spectrum measured in a non-contact fashion. *Biomed Opt Express* **8**, 78-103 (2017).
55. Alkhalil, B. C. Carney, T. E. Travis, S. Muhie, S. A. Miller, J. C. Ramella-Roman, P. Ghassemi, R. Hammamieh, M. Jett, L. T. Moffatt, J. W. Shupp, Key Cell Functions are Modulated by Compression in an Animal Model of Hypertrophic Scar. *Wounds* **30**, 353-362 (2018).
56. A. K. Bittner, K. Seger, R. Salveson, S. Kayser, N. Morrison, P. Vargas, D. Mendelsohn, J. Han, H. Bi, G. Dagnelie, A. Benavente, J. Ramella-Roman, Randomized controlled trial of electro-stimulation therapies to modulate retinal blood flow and visual function in retinitis pigmentosa. *Acta Ophthalmol* **96**, E366-E376 (2018).
57. J. Chue-Sang, N. Holness, M. Gonzalez, J. Greaves, I. Saytashev, S. Stoff, A. Gandjbakhche, V. Chernomordik, G. Burkett, J. Ramella-Roman, Use of Mueller matrix colposcopy in the characterization of cervical collagen anisotropy. *J Biomed Opt* **23**, 1-9 (2018).
58. A. H. Hielscher, J. Ramella-Roman, L. V. Wang, Special Section Guest Editorial: Pioneer in Biomedical Optics: Introduction to the Special Section in Honor of Steven L. Jacques. *J Biomed Opt* **23**, 1-3 (2018).
59. T. E. Travis, P. Ghassemi, N. J. Prindeze, L. T. Moffatt, B. C. Carney, A. Alkhalil, J. C. Ramella-Roman, J. W. Shupp, Matrix Metalloproteinases Are Differentially Regulated and Responsive to Compression Therapy in a Red Duroc Model of Hypertrophic Scar. *Eplasty* **18**, e1 (2018).
60. A. Alkhalil, B. C. Carney, T. E. Travis, S. Muhie, S. A. Miller, J. C. Ramella-Roman, P. Ghassemi, R. Hammamieh, M. Jett, L. T. Moffatt, J. W. Shupp, Dyspigmented Hypertrophic Scars: beyond Skin Color. *Pigment Cell Melanoma Res*, (2019).
61. J. Chue-Sang, M. Gonzalez, A. Pierre, M. Laughrey, I. Saytashev, T. Novikova, J. C. Ramella-Roman, Optical phantoms for biomedical polarimetry: a review. *J Biomed Opt* **24**, 1-12 (2019).
62. M. Tesfamariam, A. Mirza, D. Chaparro, A. Ali, R. Montalvan, I Saytashev, B. Gonzalez, A. Barreto, J. Ramella-Roman, J. Hutcheson, S. Ramaswamy, "Elastin-Dependent Aortic Heart Valve Leaflet Curvature Changes During Cyclic Flexure," *Bioengineering*, 6, 39; doi:10.3390/bioengineering6020039 (2019)
63. Ilyas Saytashev, Sudipta Saha, Joseph Chue-Sang, Pedro Lopez, Megan Laughrey, and Jessica C. Ramella-Roman, "Self-validating Mueller matrix Micro-Mesoscope (SAMMM) for the characterization of biological media," *Opt. Lett.* 45, 2168-2171 (2020)
64. Vashist Arti, Atluri Venkata, Raymond Andrea, Kaushik Ajeet, Parira Tiyash, Huang Zaohua, Durygin Andriy, Tomitaka Asahi, Nikkhah-Moshaie Roozbeh, Vashist Atul, Agudelo Marisela, Chand Hitendra S., Saytashev Ilyas, Ramella-Roman Jessica C., Nair

- Madhavan, "Development of Multifunctional Biopolymeric Auto-Fluorescent Micro- and Nanogels as a Platform for Biomedical Applications, *Frontiers in Bioengineering and Biotechnology*", 8, 2020, <https://doi.org/10.3389/fbioe.2020.00315>
65. J Chue-Sang and J C Ramella-Roman, Optimization of the incident wavelength for Mueller Matrix imaging of cervical collagen, *Asian Journal of Physics* (Invited) ISSN: 0971 - 3093 Vol 29, Nos 1&2, January-February, 2020.
 66. Chaparro D, Dargam V, Alvarez P, et al. A Method to Quantify Tensile Biaxial Properties of Mouse Aortic Valve Leaflets [published online ahead of print, 2020 Apr 15]. *J Biomech Eng.* 2020;10.1115/1.4046921. doi:10.1115/1.4046921
 67. Jessica C. Ramella-Roman, Ilyas Saytashev, Mattia Piccini, "A review of polarization based imaging technologies for clinical and pre-clinical applications," *Journal of Optics* (Submitted, Invited)
 68. Mariacarla Gonzalez, Karla Montejó, Karl Krupp, Vijaya Srinivas, Edward DeHoog, Purnima Madhivanan, Jessica C. Ramella-Roman, "Design and implementation of a portable colposcope Mueller Matrix polarimeter," (Submitted, *Journal of Biomedical Optics*)
 69. Tananant Boonya-ananta, Andres J. Rodriguez, Ajmal Ajmal, Vinh Nguyen Du Le, Anders K. Hansen, Joshua D. Hutcheson, Jessica C. Ramella-Roman, Synthetic Photoplethysmography (PPG) of the radial artery through parallelized Monte Carlo and its correlation to Body Mass Index (BMI)', (Submitted to *Scientific Reports*).

PEER REVIEWED ABSTRACTS

1. D. D. Duncan, J. Ramella-Roman, Q. D. Nguyen, Full-Field, Video-Based Quantitative Measurement of Retinal Blood Flow Velocity. *Invest Ophthalmol Vis Sci* **51**, (2010).
2. J. C. Ramella-Roman, P. Lemaillet, D. Duncan, M. Ibrahim, Q. Nguyen, Imaging System for Oxygen Saturation and Blood Flow Measurement in the Retina. *Invest Ophthalmol Vis Sci* **51**, (2010).
3. J. Ramella-Roman, Measurement of retina vascular flow across small and large vessel sizes. *Invest Ophthalmol Vis Sci* **55**, (2014).
4. J. C. Ramella-Roman, D. Rodriguez, Q. Z. Wang, J. Pfefer, Error analysis of two-wavelength algorithms for retinal oximetry. *Invest Ophthalmol Vis Sci* **56**, (2015).
5. A. K. Bittner, K. R. Seger, S. Kayser, J. C. Ramella-Roman, Increased Velocity of Retinal Blood Flow in RP subjects with Significantly Improved Visual Function following Transcorneal Electrical Stimulation in a Randomized Controlled Trial. *Invest Ophthalmol Vis Sci* **57**, (2016).
6. D. A. Rodriguez, T. J. Pfefer, Q. Z. Wang, P. F. Lopez, J. C. Ramella-Roman, A Monte Carlo Analysis of Error Associated With Two-Wavelength Algorithms for Retinal Oximetry. *Invest Ophthalmol Vis Sci* **57**, 6474-6481 (2016).
7. I. Saytashev, N. Lopez, J. Chue-Sang, J. Ramella-Roman, Simultaneous second harmonic generation and Mueller Matrix polarimetry imaging of the rat cornea. *Invest Ophthalmol Vis Sci* **59**, (2018).
8. N. Sevilla, I. Saytashev, P. Lopez, J. Chue-Sang, H. Wertheim, J. Ramella-Roman, Measurements of retinal temperature using Laser Speckle Imaging (LSI). *Invest Ophthalmol Vis Sci* **59**, (2018).

9. Jessica C Ramella-Roman; Joseph Chue-Sang; Megan Laughrey; Natalia Lopez; Ilyas Saytashev, "Full assessment of cornea structure with a combined confocal Mueller Matrix and non-linear microscope," *Invest Ophth Vis Sci* **60**(9):2137. (2019)

BOOK CHAPTERS

1. S.L. Jacques, S.L. and J.C. Ramella-Roman, "Polarized light imaging of tissue." In Laser and current optical techniques in biology, Comprehensive series in Photo-Sciences, 5, Giuseppe Palumbo and Riccardo Pratesi Editors, ESP book series (2004).
2. J.C. Ramella-Roman, "MonteCarlo models of polarized light into scattering media," NATOASI on Optical Waveguide Sensing and Imaging, Springer. In Optical Waveguide Sensing and Imaging, Nato Science for Peace and Security Series B: Physics and Biophotonics, (2007).
3. J.C. Ramella-Roman, "Polarized light scattering in skin, hemispherical scattering," NATO ASI on Optical Waveguide Sensing and Imaging, Springer. In Optical Waveguide Sensing and Imaging, Nato Science for Peace and Security Series B: Physics and Biophotonics, (2007).
4. S. Kirkpatrick, D. Duncan, and J.C. Ramella-Roman, "Monitoring of Blood Flow and Hemoglobin Oxygenation," Handbook of Biophotonics, 2, Wiley-VCH Editors, (2011)
5. Md Ashfaq Ahmed, Yuqiang Bai, J.C. Ramella-Roman, R. Jung, "Neurophotonics for peripheral nerves", Textbook of NeuroPhotonics and Brain Mapping, Taylor and Francis, (2016)

PROCEEDINGS

1. S. L. Jacques, J. R. Ramella-Roman, Propagation of polarized light beams through biological tissues. *Proc Spie* **3914**, 345-352 (2000).
2. J. Roman, S. L. Jacques, Imaging of superficial tissues with polarized light. *Osa Trends Opt Photo* **38**, 111-113 (2000).
3. J. C. Ramella-Roman, S. L. Jacques, Mueller Matrix description of collimated light transmission through liver, muscle and skin. *Proc Spie* **4257**, 110-116 (2001).
4. S. L. Jacques, J. C. Ramella-Roman, K. Lee, Imaging skin with polarized light. *P Ann Int leee Embs*, 2314-2315 (2002).
5. J. C. Ramella-Roman, K. Lee, S. A. Prahl, S. L. Jacques, Polarized light imaging with a hand-held camera. *P Soc Photo-Opt Ins* **5068**, 284-293 (2002).
6. S. L. Jacques, J. C. Ramella-Roman, K. Lee, Imaging superficial tissue layers using polarized light with a hand-held camera. *P Soc Photo-Opt Ins* **5254**, 14-23 (2003).
7. J. C. Ramella-Roman, K. Lee, S. L. Jacques, A hand-held polarized-light camera for the detection of skin cancer borders. *Proc Spie* **5192**, 54-60 (2003).
8. J. C. Ramella-Roman, D. Duncan, T. A. Germer, Out-of-plane polarimetric imaging of skin: Surface and subsurface effects. *Proc Spie* **5686**, 142-153 (2005).
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10. J. C. Ramella-Roman, D. D. Duncan, A new approach to Mueller matrix reconstruction of skin cancer lesions using a dual rotating retarder polarimeter. *Proc Spie* **6080**, (2006).
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20. J. C. Ramella-Roman, A. Basiri, M. Nabili, Imaging spectroscopy with a multi-aperture camera. *Ieee Leos Ann Mtg*, 209-210 (2009).
21. J. C. Ramella-Roman, A. Pfefer, J. Hidler, Quantitative assessment of autonomic dysreflexia with combined spectroscopic and perfusion probes. *Proc Spie* **7169**, (2009).
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25. T. A. Nguyen, A. Basiri, J. C. Ramella-Roman, Imaging spectroscopy of thermal and electrical burs. *Proc Spie* **7548**, (2010).
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27. A. Basiri, D. L. Edelstein, F. M. Giardiello, J. C. Ramella-Roman, Detection of Familial Adenomatous Polyposis with Polarized Spectroscopic Imaging and Oral Vascular Density. *Proc Spie* **7897**, (2011).

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32. T. T. A. Nguyen, A. Basiri, J. W. Shupp, L. T. Moffatt, M. H. Jordan, J. C. Jeng, E. Leto, J. C. Ramella-Roman, Assessment of electrical burn injury using structured illumination in an in vivo electrical injury model. *Proc Spie* **7999**, (2011).
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47. T. Ho, A. T. Nguyen, A. Lichy, S. Groah, J. C. Ramella-Roman, The efficacy of Pressure Relief Maneuvers in Spinal Cord Injury Patients, a clinical study. *Proc Spie* **8938**, (2014).
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51. J. C. Ramella-Roman, S. Winhoven, The role of camera and illumination choices in absolute blood velocity measurements. *Proc Spie* **9322**, (2015).
52. J. T. Wang, P. Ghassemi, A. Melchiorri, J. Ramella-Roman, S. A. Mathews, J. Coburn, B. Sorg, Y. Chen, J. Pfefer, 3D Printed Biomimetic Vascular Phantoms for Assessment of Hyperspectral Imaging Systems. *Proc Spie* **9325**, (2015).
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54. J. Chue-Sang, J. C. Ramella-Roman, Imaging of skin surface architecture with out of plane polarimetry. *Proc Spie* **9689**, (2016).
55. J. C. Ramella-Roman, S. Stoff, J. Chue-Sang, Y. Q. Bai, Imaging and modeling of collagen architecture in living tissue with polarized light transfer (Conference Presentation). *Proc Spie* **9696**, (2016).
56. S. Stoff, J. Chue-Sang, N. A. Holness, A. Gandjbakhche, V. Chernomordik, J. Ramella-Roman, Cervical Collagen Imaging for Determining Preterm Labor Risks Using a Colposcope with Full Mueller Matrix Capability. *Proc Spie* **9689**, (2016).
57. M. Gonzalez, N. Sevilla, J. Chue-Sang, J. Ramella-Roman, Quantitative Analysis of a Scar's Pliability, Perfusion and Metrology. *Proc Spie* **10067**, (2017).
58. A. S. Joseph, Y. Q. Bai, S. Stoff, M. Gonzalez, J. Gomes, A. Gandjbakhche, V. V. Chernomordik, J. C. Ramella-Roman, Use of Mueller matrix Polarimetry and Optical Coherence Tomography in the characterization of cervical collagen anisotropy. *Proc Spie* **10043**, (2017).
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- colposcopy in the characterization of cervical collagen anisotropy. *Proc Spie* **10043**, (2017).
60. J. C. Ramella-Roman, K. Montejó, N. Sevilla, S. Stoff, M. Gonzalez, J. Chue-Sang, Handheld SFDI/polarimetric imaging device for objective evaluation of hypertrophic scars (Conference Presentation). *Proc Spie* **10049**, (2017).
61. J. Chue-Sang, J. C. Ramella-Roman, Optimization of the incident wavelength for Mueller matrix imaging of cervical collagen. *Proc Spie* **10478**, (2018).
62. M. Gonzalez, I. Saytashev, C. Luna, B. Gonzalez, A. Pinero, M. Perez, S. Ramaswamy, J. Ramella-Roman, Multiphoton microscopy of ECM proteins in baboon aortic leaflet. *Proc Spie* **10471**, (2018).
63. J. C. Ramella-Roman, M. Gonzalez, J. Chue-Sang, K. Montejó, K. Krup, V. Srinivas, E. DeHoog, P. Madhivanan, A low cost portable Mueller Matrix polarimeter for the low resource setting. *Proc Spie* **10485**, (2018).
64. Tananant Boonya-ananta, Andres Rodriguez, Anders Hansen, Joshua Hutcheson, Jessica Ramella-Roman, Modeling of a photoplethysmographic (PPG) waveform through monte carlo as a method of deriving blood pressure in individuals with obesity. *Proc Spie*. **11238**, Optical Interactions with Tissue and Cells XXXI (2020).
65. Andres Rodriguez, Tananant Boonya-ananta, Akash Kumar Maity, Ashok Veeraraghavan, Rolf Saager, Jessica Ramella-Roman, Experimental integration of a spatial frequency domain spectroscopy and pulse cam system for quantifying changes in skin optical properties and vasculature among individuals with obesity, *Proc Spie*. **11211**, Photonics in Dermatology and Plastic Surgery (2020).
66. Jesse Fine, Tananant Boonya-ananta, Andres Rodriguez, Jessica Ramella-Roman, Mike McShane, Gerard Cote, Parallelized multi-layered Monte Carlo model for evaluation of a proximal phalanx photoplethysmograph, *Proc Spie*. **11247**, Optical Diagnostics and Sensing XX: Toward Point-of-Care Diagnostics (2020)

OTHER PUBLICATIONS

Jessica Ramella-Roman, Thu Ann Nguyen, Lauren T. Moffatt, Marion H. Jordan, and Jeff Shupp, "Better evaluation of electric shock injuries," SPIE Newsroom

<http://spie.org/x86673.xml> (2012)

Jessica Ramella-Roman review in Spotlight in Optics of "Reflectance confocal microscopy of optical phantoms," published in Biomedical Optics Express, Vol. 3 Issue 6, pp.1162-1172 (2012)

The paper by Long Luu, Patrick A. Roman, Scott A. Mathews, Jessica C. Ramella-Roman, "Microfluidics based phantoms of superficial vascular network," Biomedical Optics Express, 3(6), 1350-1364, (2012) was highlighter in Spotlight in Optics (<http://www.opticsinfobase.org/spotlight/summary.cfm?uri=boe-3-6-1350>)

GRANTS AND CONTRACTS

Ongoing Research Support

1. NSF: Engineering Research Center for Precise Advanced Technologies and Health Systems for Underserved Populations (PATHS-UP), Principal Investigator: Gerry Cote, PI for FIU: Ramella-Roman EEC Start Date:10/01/2017 End Date 10/1/2022; Total Award Amount: \$20,000,000.00, Amount to FIU \$3,500,000.00;
2. NSF: STC Integrative Partnerships program: Science and Technology Center on Real-Time Functional Imaging (Principal Investigator: Margaret Murnane Co-Principal Investigator for FIU: Ramella-Roman) Start Date:1/01/2016 End Date 1/1/2021 Total Award Amount: \$24,000,000.00, Amount to FIU \$3,600,000.00;
3. NSF: REM Freshman Supplement, Co-PI Ramella-Roman, Start Date:1/10/2018 End Date 30/9/2020 Total Award \$93,000
6. Herbert Wertheim Foundation (PI: Ramella-Roman)
“Development of an adaptive optics nonlinear microscope”
The purpose of this project is to add adaptive optics capability to our nonlinear microscope to improve imagery in the animal model of diabetic retinopathy. Start Date:09/01/2016; End Date 5/1/2020 Total Award Amount: \$200,000.00;

Pending Grants

Agency: NIH – Role: PI Mechanical and molecular assessment of cervical changes during pregnancy (R01HD099539)

Past Grants

1. Role: Co-PI: NRT-IGE: Nanomedicine Academy of Minority Serving Institutions Award Number:1545279; Principal Investigator: Srinivas Sridhar; Organization: Northeastern University; Start Date:10/01/2015; Award Amount: \$495,348.00;
2. Role: Co-PI: NSF-CMMI: Carbon Nanotube Based Nanofluidic Device for Biological Sensing, Award Number:1334417; Principal Investigator: Jin He; Organization: Florida International University; Start Date:09/01/2013; Award Amount: \$395,000.00;
3. Role: PI – Agency: NSF – Icorp: A non-invasive imaging system for assessment of risk of pre-term labor (\$2,500. 2015-2016)
4. Role: Co-Investigator - Agency: NIH-NEI EY023720. Role of Ocular and Retinal Blood Flow in Visual Function Changes in Retinitis Pigmentosa. (\$270,000. 2013-2016)
5. Role: PI - Agency: U.S. Department of Education and the National Institute on Disability and Rehabilitation Research consortium. Skin Microvascular and Metabolic Response to

Sitting and Pressure Relief Maneuvers in People with Spinal Cord Injury. (\$170,000. 2010-2015)

- 6 Role: Co-Investigator - Agency: NIH-NEI. RO1EY017577 Novel Assessment of Early Changes in Diabetic Retinopathy. (\$1,775,811. 2008-2011)
- 7 Role: PI - Agency: NIH. R15EB013439. Novel Imaging System to Objectively Assess the Natural History of Treated and Untreated Hypertrophic Scar Formation. (\$408,664, 2011-2014 – cost extension to 2015)
- 8 Role: PI - Agency: NIST. Retinal Oximeter using hyperspectral imaging for assessment of early signs of Diabetic Retinopathy. (\$74,028. 2009-2011)
- 9 Role: PI - Agency: NIST. Type: Conference. Organize an international workshop on optical phantoms at CUA. (\$25,000, 2011-2012)
- 10 Role: PI - Agency: Coulter Foundation. Retinal Oximeter using Novel Multi-aperture Camera for assessment of early signs of Diabetic Retinopathy. (\$240,000. 2007-2009)
- 11 Role: PI - Agency: Christopher Reeve Foundation. Skin hypoxia and the formation of skin ulcer in individuals with autonomic dysreflexia. (\$150,000. 2007-2009)
- 12 Role: PI - Agency: Christopher Reeve Foundation. Measurement of autonomic dysreflexia on the rat model. (\$5,000. 2008-2009)
- 13 Role: Co-Investigator - Agency: Defense Microelectronics activity contracting division subcontract from CUA Electrical Engineering. Periodic. (\$40,000. 2007-2009)
- 14 Role: PI - Agency: Johns Hopkins University, APL. Characterization of skin optical response for human signatures characterization. (\$25,000. 2007)
- 15 Role: PI - Agency: NICHD/NINDS, Type: HD050845. The influence of skin hypoxia in the formation of skin ulcer and skin thickening in individuals with autonomic dysreflexia. (\$25,000. 2006-2007)
- 16 Role: Co-Investigator - Agency: Disruptive Technology Office (DTO), subcontract from The University of New Mexico. Compact Multi-Aperture Camera. (\$12,000. 2006)
- 17 Role: PI - Agency: Johns Hopkins University, APL. Evaluation of Biophotonics Techniques. (\$25,000. 2005-2006)

PATENTS and PROVISIONAL APPLICATIONS

1. Materials and methods for detecting and monitoring edema and related conditions

Patent number: 10517533

Issued: December 31, 2019

Inventors: Shekhar Bhansali, Karina Rincon, Jessica Ramella-Roman, Sanjukta Bhanja

2. Materials and methods for non-invasively measuring temperature distribution in the eye

Patent number: 10349837

Issued: July 16, 2019

Inventors: Jessica Ramella-Roman, Herbert Wertheim, Pedro Lopez, Yuqiang Bai

3. Lenslet Array for Retinal Oximetry

Publication number: US 799,773, B2

Publication date: September 27, 2018

Inventor: Ramella-Roman, Jessica, Mark Mirotznik, and Scott Matthews.

4. Optical Imaging for Preterm Birth Assessment

Publication number: 20180271430

Filed: March 24, 2017

Publication date: September 27, 2018

Inventor: Jessica Ramella-Roman

INVITED TALKS – Speaker J.C. Ramella-Roman

1. NIH mock study session on the peer review process for NIH grants. SPIE Photonics West 2001.
2. Biomedical Sensors, Department of Electrical Engineering, Oregon Graduate Institute of Science and 15. Engineering, Portland, OR. Part of the Semiconductor Sensors class, 2002.
3. Imaging skin pathologies with polarized light: empirical and theoretical studies, National Institute of Standards, Gaithersburg, MD, 2004.
4. Out of plane polarimetry for skin lesion imaging, George Washington University, Washington, DC, 2005.
5. Polarized light imaging of skin surface effects, NATO--Advanced Study Institute, Optical Waveguide sensing and imaging in medicine, environment, security and imaging, Ottawa Canada, 2006.
6. Polarized light Monte Carlo, NATO-Advanced Study Institute, Optical waveguide sensing and imaging in medicine, environment, security and imaging, Ottawa Canada, 2006.
7. A lenslet-based device for measuring oxygen saturation in the retina and other biomedical applications, Catholic University of America, Biology Department, 2007.
8. Spectroscopic measurement of oxygen saturation in the retina, Food and Drug Administration, Modern Topics in Biomedical Optics, 2007.
9. The impact of autonomic dysreflexia on SCI patients skin and its role in skin ulcer formation, Christopher and Dana Reeve Foundation Meeting, Atlanta, GA, 2008.
10. Impact of autonomic dysreflexia on the SCI patient skin, ICORD, British Columbia CA, 2009.
11. Imaging spectroscopy with a multi-aperture camera, The Johns Hopkins University, Electrical Engineering Department, Baltimore, MD, 2009.

12. Imaging spectroscopy with a multi-aperture camera, The Burn Center at the Washington Hospital, Washington, DC, 2009.
13. Evaluation of optical properties of biological tissue with spectroscopic imaging, George Mason University, Electrical Engineering Department, VA, 2010.
14. Novel approaches in optical medical imaging, University of Delaware, Electrical Engineering Department, DE, 2010.
15. Autonomic dysreflexia and the skin, Adventist Rehabilitation Hospital of Maryland, 2010.
16. A novel instrument aimed at measuring hypertrophic scar formation, Poem Conference Wuhan China, 2010
17. Extrapolation of skin optical properties with structured illumination and four phases algorithm, NIST Optical Medical Imaging Workshop 2010
18. OASIS Conference 2011, Tel Aviv, Israel
19. Novel approaches for spectral polarimetry of biological tissue 2011, University of Maryland Biomedical Engineering
20. Use of polarized light imaging and sensing in the clinical setting, a short course. La Plata Mexico, 2011
21. A study on retinal superficial vasculature and structure using a combined flow oximetry and OCT system Inter-Institute Workshop on Optical Diagnostic and Biophotonic Methods from Bench to Bedside, Bethesda MD.
22. Monitoring Electrical and Thermal Burns with Spatial Frequency Domain Imaging, SESAPS 2011 Annual Meeting of American Physics Society, Roanoke VA, 2011
23. Monitoring of Electrical Burns, Washington Hospital Center, Washington DC, 2011
24. Optical Phantoms for retina spectroscopy, NIST optical phantom workshop, Washington DC, 2011
25. Modeling of skin cooling, blood flow, and optical properties in wounds created by electrical shock," SPIE San Francisco, 2012
26. OSA Biomed Miami - "Assessment of the Natural History of Treated and Untreated Scars with a Novel Imaging System System" April 2014
27. International Workshop on Tissue Phantoms and Standardization in Biophotonics "Phantoms for Multi-Spectral imaging – retina oximetry" May 21st 2014
28. ICCB Conference, "Modeling of blood flow in the retina" Barcelona Spain, 9/2015 (**)
29. Michigan Tech University, 11/2015
30. SPIE Photonics West San Francisco, "The role of camera and illumination choices in absolute blood velocity measurements" San Francisco 2/2015
31. SPIE Photonics West San Francisco, "Imaging and modeling of collagen architecture in living tissue with polarized light transfer" San Francisco 3/2016
32. Beckman Laser Institute, "Polarization signature in tissue anisotropy", 5/2016.
33. BIOAM-2016: Biophotonics and Optical Angular Momentum - Ecole polytechnique - Palaiseau (France), 10/2016

34. Advances in Biomedical Polarimetry with OCT, Boston MA, 3 / 2018
35. Discussion Leader of the 2018 Lasers in Medicine and Biology Gordon Research Seminar (GRS), which will be held at Bates College in Lewiston, Maine
36. Plenary Talk, "Towards the determination of spontaneous preterm birth risk with polarization based imaging of the uterine cervix extracellular matrix," The China Symposium on Polarimetry and Ellipsometry Tsinghua Berkeley Shenzhen Institute, Guangdong 11 / 2018
37. University of Toronto, "Understanding the origin of the Mueller Matrix of biological samples in back-reflected configuration," Canada 12/2018
38. BIOAM-2018 Biophotonics and Optical Angular Momentum "Label-free Mueller matrix imaging of anisotropic media with in situ correlation to structure through non-linear microscopy" Ecole polytechnique - Palaiseau (France), 11 / 2018
39. BMES 2018 Atlanta 11/2018, "Mueller Matrix Imaging of the extracellular matrix with in situ correlation to structure through non-linear microscopy".
40. SPIE Photonics West, 30th Anniversary Session: Tissue Optics, Laser-Tissue Interaction, and Tissue Engineering 2 / 2019
41. Ecole Polytechnique, Palaiseau, France: Biomedical Applications of polarimetry 7 / 2019
42. SPIE FIU student chapter Kickoff meeting: Biomedical imaging, clinical and pre-clinical applications, 10/2019
43. FIU student chapter Kickoff meeting: Biomedical imaging, clinical and pre-clinical applications, 10/2019
44. JBO Webinar Series, "Wearable, Implantable, Mobile, and Remote Biomedical Optics & Photonics." 7/20/2020

GRADUATE STUDENTS PRIMARY ADVISOR

Haripriya Kandimalla M.S., 2007
Afshin Nabili M.S., 2008
Marjian Nabili M.S., 2009
Ali Basiri Ph.D. 2013
Thu Nguyen Ph.D. 2012
Mamdouh Aloraefy, Ph.D. 2013
Pejhman Ghassemi, Ph.D. 2013
Joseph Chue-Sang, Ph.D. 2019

MariaCarla Gonzalez, in progress

Mel Tanant Boonya, in progress

Andres Rodriguez, in progress

Ajmal Ajmal, in progress

GRADUATE COURSES DEVELOPED

BME 494, Senior Project Laboratory, Spring 2009, 2010, 2011

BME 491, Seminars in Biomedical Engineering, Fall 2007

BME 581, Medical Imaging, Fall 2005, 2006, 2007, 2008, 2009,2010

BME 513, Biomedical Instrumentation, Spring 2006, 2007, 2008, 2010

BME 514, Biomedical Optics, Spring 2007, 2008, 2010, 2011

BME 515, Biomedical Signal Processing, Fall 2006

BME 681, Advanced Topics in Medical Imaging, Fall 2010

BME 4503C Medical Instrumentation Design, Online Course offered every semester at FIU.