MARY JANE SIMPSON
Tel: (321)-277-8417
Email: simpsonm@ornl.gov

EDUCATION

OAK RIDGE NATIONAL LABORATORY **08/2014 – present**
Post-doctoral associate
Laser Spectroscopy and Chemical Microtechnology Group
Description: built transient absorption spectroscopic microscope with an amplified laser system and optical parametric amplifier to characterize nanomaterials, and wrote data analysis software to extract 2-D images from hyperspectral data sets

DUKE UNIVERSITY **08/2009 – 05/2014**
Ph.D. in Chemistry
Advisor: Warren S. Warren
Description: maintained and used homebuilt transient absorption spectroscopic microscope to study nonlinear optical phenomena in biological systems and nanomaterials

DUKE UNIVERSITY **08/2009 – 05/2014**
Certificate in College Teaching

STETSON UNIVERSITY **08/2006 – 05/2009**
Bachelor of Science, Chemistry, *Cum Laude*

EXPERTISE

Optics: lasers, nonlinear optics, spectroscopy, acousto-optics, photonic crystal fibers, amplified lasers, optical parametric oscillators/amplifiers, laser safety
Chemistry: basic synthesis, waste management, chemical characterization
Microscopy: confocal, laser scanning, fluorescence, second harmonic generation, multimodal
Spectroscopy: atomic absorption, UV-Vis, fluorescence, Raman
Data analysis: Python (SciPy, NumPy), Matlab, Labview, Origin
Communication: oral presentations, scientific writing, teaching, mentoring
RF Electronics: oscilloscopes, frequency generators, lock-in amplifiers

HONORS AND AWARDS

Kathleen Zielek Fellowship **2013**
Duke University Department of Chemistry

Poster Prize **2012**
Duke Center for *In Vivo* Microscopy Annual Meeting

Burroughs-Wellcome Fellowship **2012**
Duke University Department of Chemistry

Poster Prize in Melanins Category **2011**
International Pigment Cell Conference

IFPCS Travel Award to Conference in Bordeaux, France **2011**
International Federation of Pigment Cell Societies

1st Place Poster Presentation **2010**
Fitzpatrick Institute for Photonics Annual Meeting

Outstanding Senior Award **2009**
Stetson University Department of Chemistry

Undergraduate Award in Analytical Chemistry **2008**
American Chemical Society

Award for Achievement in Organic Chemistry **2007**
National Information Center for Polymer Education

PUBLICATIONS

M. J. Simpson, B. Doughty, B. Yang, K. Xiao, Y.-Z. Ma, "Spatial localization of excitons and charge carriers in hybrid perovskite thin films" *submitted.*

J. W. Wilson, S. Degan, C. S Gainey, T. Mitropoulos, **M. J. Simpson**, J. Y. Zhang, W. S. Warren, "Comparing in vivo pump–probe and multiphoton fluorescence microscopy of melanoma and pigmented lesions" *Journal of Biomedical Optics*, **20** (5), 051012-051012 (2015).

M. J. Simpson, J. W. Wilson, F. E. Robles, C. P. Dall, K. Glass, J. D. Simon, W. S. Warren, "Near Infrared Excited State Dynamics of Melanins: the Effects of Iron Content, Photo-Damage, Chemical Oxidation, and Aggregate Size" *Journal of Physical Chemistry A*, **118** (6), 993-1003 (2014).

M. J. Simpson, K. E. Glass, J. W. Wilson, P. Wilby, J. D. Simon, W. S. Warren, "Pump-Probe Microscopic Imaging of Jurassic-Aged Eumelanin," *Journal of Physical Chemistry Letters*, **4** (11), 1924-1927 (2013).

M. J. Simpson, J. W. Wilson, M. A. Phipps, F. E. Robles, M. A. Selim, W. S. Warren, "Nonlinear Microscopy of Eumelanin and Pheomelanin with Subcellular Resolution," *Journal of Investigative Dermatology*, **133**, 1822-1826 (2013).

T. E. Matthews, J. W. Wilson, J. Y. Zhang, **M. J. Simpson**, J. Y. Jin, W. S. Warren, "In vivo and ex vivo epi-mode pump-probe imaging of melanin and microvasculature," *Biomedical Optics Express*, **2**, 1576-1583 (2011).

J. Wilson, T. Matthews, S. Degan, J. Zhang, **M. J. Simpson**, W. Warren, "Pump-Probe Melanoma Imaging: Applications to High-Resolution and In-Vivo Microscopy," postdeadline paper PDPB5, CLEO 2011, Baltimore, MD.

T. E. Matthews, I. R. Piletic, M. A. Selim, **M. J. Simpson**, W. S. Warren, "Pump-probe imaging differentiates melanoma from melanocytic nevi," *Science Translational Medicine*, **3**, 71ra15 (2011).

SELECT PRESENTATIONS

"Investigating the Metastatic Potential and Pigment Chemistry of Melanomas Using Pump-Probe Imaging"
Invited Oral Presentation
Photonics West, San Francisco, CA, USA
2 February 2013

"Investigating the Metastatic Potential and Pigment Chemistry of Melanomas Using Pump-Probe Imaging"
Featured Poster Presentation
Fitzpatrick Institute for Photonics Breakfast, Durham, NC, USA
9 November 2012

"Pump-Probe Imaging of Melanin Identifies Metastatic Potential of Melanoma"
Oral Presentation
Frontiers in Optics and Laser Science, Rochester, NY, USA
16 October 2012

“Imaging the Distribution of Melanin in Human Skin Lesions with Pump-Probe Microscopy”
Oral Presentation
Frontiers in Optics and Laser Science, San Jose, CA, USA
17 October 2011

“Imaging the Distributions of Eumelanin and Pheomelanin in Human Tissue”
Poster Presentation
International Pigment Cell Conference, Bordeaux, FR
21 September 2011

“Beyond Pathology: Pump-Probe Imaging of Skin Slices Provides Additional Indicators of Melanoma”
Oral Presentation
Novel Techniques in Microscopy, Monterey, CA, USA
4 April 2011

PROFESSIONAL MEMBERSHIPS	**American Chemical Society**	**2009 –**
	American Physical Society	**2011 – 2013**