CURRICULUM VITAE

NAME	POSITION TITLE (MOST RECENT)
Gary Lee Thompson, Ph.D.	Assistant Professor of Chemical Engineering
ADDRESS WORK (MOST RECENT) Rowan Hall, Room 333 Department of Chemical Engineering Rowan University 201 Mullica Hill Road Glassboro, NJ 08028	CONTACT INFO E-mail: thompsong@rowan.edu LinkedIn: https://www.linkedin.com/in/DrGaryThompsonRowanU

EDUCATION

INSTITUTION	DEGREE	YEAR	FIELD OF STUDY
Clemson University Title: "Electromechanics of Biological Systems Studied by Scanning Probe Microscopy" Advisor: Dr. Alexey Vertegel	Ph.D.	2011	Bioengineering
University of South Carolina	B.S.	2004	Chemical Engineering

PROFESSIONAL EXPERIENCE

06/13-08/16 — *Oak Ridge Institute of Science and Education Postdoctoral Research Associate:*
U.S. Air Force Research Laboratory, 711 HPW/RHDO, Fort Sam Houston, TX
- Studied the physical mechanisms and cell physiological responses to high intensity pulses of directed energy using fluorescence microscopy and force spectroscopy of nerves, transfected cells, and pure phospholipid constructs

05/11-05/13 — *National Research Council Postdoctoral Research Associate:*
U.S. Air Force Research Laboratory, 711 HPW/RHDR, Fort Sam Houston, TX
- Investigation of mechanobiology of cell responses to nanosecond pulsed electric fields using atomic force microscopy (AFM)

06/10-08/10 — *Repperger Research Intern:*
Ball Aerospace & Technology Corp., Brooks City-Base, San Antonio, TX
- Research on delivery of highly-localized nanosecond pulsed electric fields using AFM

08/05-05/11 — *Graduate Research and Teaching Assistant:*
Department of Bioengineering, Clemson University, Clemson, SC
- Application of piezoresponse force microscopy (PFM) and band excitation PFM for measurement of mechanical properties and electromechanical responses associated with hydroxyapatite, amyloid fibers, bacteria, diatoms, yeast and mammalian cells
- Preparation of protein-nanoparticle conjugates for use in drug delivery

HONORS & AWARDS

- Oak Ridge Institute for Science & Education Postdoctoral Research Associateship, 2013
- National Research Council of the National Academies Postdoctoral Research Associateship, 2011
- Clemson Bioengineering Page Morton Hunter Graduate Researcher Award, 2011
- Repperger Summer Research Internship at U.S. Air Force Research Laboratory, 2010
- Oak Ridge National Laboratory User Meeting Scholarship, 2007-2008, 2010
- Professional Enrichment Grant, Clemson University, 2007
- National Science Foundation Research Experience for Undergraduates in Japan, Osaka University, 2003
- National Science Foundation Research Experience for Undergraduates, South Dakota School of Mines & Technology, 2002

PUBLICATIONS

Citations: 292
H-index: 12 (Google Scholar)

Journal Publications

1. Tolstykh G, Thompson GL, Beier HT, Steelman ZA, Ibey BL. nsPEF-induced PIP2 depletion, PLC activity and actin cytoskeletal cortex remodeling are responsible for post-exposure cellular swelling and blebbing. *Biochem Biophys Rep*, 2016,9:36.
2. Thompson GL, Roth CC, Kuipers M, Tolstykh G, Beier HT, Ibey BL. Permeabilization of the nuclear envelope following nanosecond pulsed electric field exposure. *Biochem Biophys Res Commun*, 2016, 470:35.
3. Thompson GL, Dalzell D, Roth CC, Kuipers M, Bernhard JA, Payne JA, Ibey BL. Calcium influx affects intracellular transport and membrane repair following nanosecond pulsed electric field exposure. *J Biomed Opt*, 2014, 19:055005.
4. Thompson GL, Roth CC, Tolstykh G, Kuipers M, Ibey BL. Disruption of the actin cytoskeleton contributes to susceptibility of cells to nanosecond pulsed electric fields. *Bioelectromagnetics*, 2014, 35:262.
5. Estlack LE, Roth CC, Thompson GL, Lambert WA, Ibey BL. Nanosecond pulsed electric fields differentially activate extrinsic death receptor pathway. *Apoptosis*, 2014, 19:1755.
6. Nagami H, Umakoshi H, Kitaura T, Thompson GL, Shimanouchi T, Kuboi R. Development of metal affinity-immobilized liposome chromatography and its basic characteristics. *Biochem Eng J*, 2014, 84:66.
7. Tolstykh GP, Beier HT, Roth CC, Thompson GL, Ibey BL. 600 ns pulse electric field-induced phosphatidylinositol 4,5-bisphosphate depletion. *Bioelectrochemistry*, 2014, 100:80.
8. Tolstykh GP, Beier HT, Roth CC, Thompson GL, Payne JA, Kuipers MA, Ibey BL. Activation of intracellular phosphoinositide signaling after a single 600ns electric pulse. *Bioelectrochemistry*, 2013, 94:23.
9. Roth CC, Tolstykh G, Payne JA, Kuipers MA, Thompson GL, DeSilva MN, Ibey BL. Nanosecond pulsed electric field thresholds for nanopore formation in neural cells. *J Biomed Opt*, 2013, 18:35005.
10. Thompson GL, Reukov VV, Nikiforov MP, Jesse S, Kalinin SV, Vertegel AA. Electromechanical and elastic probing of bacteria in cell culture media. *Nanotechnology*, 2012, 23:245705.
11. Nikiforov MP, Thompson GL, Reukov VV, Jesse S, Guo S, Rodriguez BJ, Seal K, Vertegel AA, Kalinin SV. Double layer mediated electromechanical response of amyloid fibrils in liquid environment. *ACS Nano*, 2010, 4:689-98.
12. Salehi-Khojin A, Bashash S, Jalili N, Thompson GL, Vertegel A. DMCMN: modeling piezoresponse force microscopy for low dimensional materials characterization: theory and experiment, *J Dyn Syst-T ASME*, 2009; 131:061107.
13. Nikiforov MP, Vertegel AA, Reukov VV, Thompson GL, Guo S, Kalinin SV, Jesse S. Functional recognition imaging using artificial neural networks: applications to rapid cellular identification via broadband electromechanical response. *Nanotechnology*, 2009;20:405708.
14. Yurko Y, Maximov V, Andreozzi E, Thompson GL, Vertegel AA. Design of biomedical nanodevices for dissolution of blood clots. *Mat Sci Eng C-Biomim*, 2009 Apr, 29(3 SI), 737-41.
15. Bashash S, Salehi-Khojin A, Jalili N, Thompson GL, Vertegel A, Muller M, Berger R. Mass detection of elastically distributed ultrathin layers using piezoresponse force microscopy. *J Micromech Microeng*, 2009 Feb, 19(2): 025016.
16. Kalinin SV, Rodriguez BJ, Jesse S, Seal K, Proksch R, Hohlbauch S, Revenko I, Thompson GL, Vertegel AA. Towards local electromechanical probing of cellular and biomolecular systems in a liquid environment. *Nanotechnology*. 2007 Oct;18(42):424020.
17. Jimenez A, Thompson GL, Matthews MA, Davis TA, Crocker K, Lyons JS, Trapotsis A. Compatibility of medical-grade polymers with dense CO2. *J Supercrit Fluid*. 2007 Oct;42(3 SI):366-72.

Conference Proceedings

1. Moen EK, Beier HT, Thompson GL, Armani AM, Ibey BL. Nonlinear imaging of lipid membrane alterations elicited by nanosecond pulsed electric fields. 2015 SPIE Photonics West BiOS (93260T-5).
2. Moen EK, Beier HT, Thompson GL, Roth CC, Ibey BL. Nonlinear imaging techniques for the observation of cell membrane perturbation due to pulsed electric field exposure. 2014 SPIE Photonics West BiOS (89411P-6).

3. Thompson GL, Roth CC, Tolstykh G, Kuipers MA, Ibey BL. Role of cytoskeleton and elastic moduli in cellular response to nanosecond pulsed electric fields. 2013 SPIE Photonics West BiOS (85850T-9).
4. Mahlke MA, Thompson G, Estlack L, Navara C, Ibey BL. Effects of nano-second electrical pulses (nsPEFs) on cell cycle progression and susceptibility at various phases. 2013 SPIE Photonics West BiOS (85850O-7).
5. Roth CC, Payne JA, Kuipers MA, Thompson GL, Wilmink GJ, Ibey BL. Impact of nanosecond pulsed electric field on primary hippocampal neurons. 2012 SPIE Photonics West BiOS (8207-63).
6. Thompson GL, Payne J, Roth C, Pakhomov A, Wilmink G, Ibey B. Local plasma membrane permeabilization of living cells by nanosecond electric pulses using atomic force microscopy. 2011 SPIE Photonics West BiOS (7908-28).
7. Salehi-Khojin A, Bashash S, Jalili N, Thompson GL, Vertegel A. Detection of local stiffness and piezoelectric properties of materials via piezoresponse force microscopy. 2009 American Control Conference (ACC-09). 2009 June;985-90.
8. Nagami H, Umakoshi H, Kitaura T, Thompson GL, Shimanouchi T, Kuboi R. Metal affinity-immobilized liposome chromatography for stress mediated separation of biomolecules. 2004 Proc. of Asia-Pacific Confederation for Chemical Engineers, Kita-Kyushu, Japan. 799.

Non-refereed Articles

1. Tolstykh GP, Thompson GL, Beier HT, Roth CC, Ibey BL. Nanosecond pulsed electric fields activate intracellular signaling pathways. *SPIE Newsroom*. 2013March; DOI: 10.1117/2.1201302.004736.
2. Rodriguez BJ, Kalinin SV, Jesse S, Thompson G, Vertegel A, Holbauch S, Proksch R. Nanoelectromechanics of inorganic and biological systems: From structural imaging to local functionalities. *Microscopy Today*. 2008 Jan; 16(1):28-33.

Conference Presentation and Posters

Oral:

1. 2014 11th International Bioelectrics Symposium in Columbia, MO, "Nanosecond pulsed electric field exposure alters the membrane and nucleus of mammalian cells."
2. 2014 Gordon Research Conference – Bioelectrochemistry in Biddeford, ME, "Nanosecond pulsed electric field exposure alters the membrane and nucleus of mammalian cells."
3. 2013 10th International Bioelectrics Symposium in Karlsruhe, Germany, "Role of cytoskeleton in cellular response to nanosecond pulsed electric fields."
4. 2013 SPIE Photonics West BiOS in San Francisco, CA, "Role of cytoskeleton and elastic moduli in cellular response to nanosecond pulsed electric fields."
5. 2012 9th International Bioelectrics Symposium in Kumamoto, Japan, "Elastic moduli of cells in correlation to effects of nanosecond pulsed electric fields."
6. 2011 Materials Research Society Fall Meeting in Boston, MA. "Mechanical and electromechanical mapping of bacterial and mammalian cells in liquid."
7. 2011 SPIE Photonics West BiOS in San Francisco, CA, "Local plasma membrane permeabilization of living cells by nanosecond electric pulses using atomic force microscopy."
8. 2010 Repperger Internship Close-out Day in Dayton, OH, "The roles of direct field effects and cellular mechanics in pore formation by ultra short electric pulses studied by atomic force miscroscopy."
9. 2010 SEMS Annual Meeting in Charleston, SC, "Electromechanical characterization of living cells in electrolyte solutions using line mode band excitation piezoresponse force microscopy."
10. 2007 MRS Fall Meeting in Boston, MA, "Liquid piezoresponse force microscopy of living myoblasts."
11. 2007 SFB Conference in Chicago, IL, "Solution piezoresponse force microscopy of lysozyme and insulin amyloid fibrils."

Posters:

1. 2010 ORNL Users Meeting in Oak Ridge, TN, "Multimodal scanning probe microscopy for cell mechanics."
2. 2009 MRS Fall Meeting in Boston, MA, "Double-layer mediated electromechanical response of biological systems in a liquid environment."
3. 2008 ORNL Users Meeting in Oak Ridge, TN, "Amyloid fibrils: Electromechanical imaging using piezoresponse force microscopy."

4. 2008 SFB Translational Biomaterial Research Symposium in Atlanta, GA, "Piezoresponse force microscopy of biological materials and cells."
5. 2007 ORNL Users Meeting in Oak Ridge, TN, "Piezoresponse force microscopy of biological materials."
6. 2006 MRS Fall Meeting in Boston, MA, "Enzymatic activity of proteins covalently attached to polymeric nanoparticles: An in vitro testing of a nanodevice for dissolution of blood clots."
7. 2006 SC INBRE Meeting in Clemson, SC, "Artificial signal transduction cascades for switchable bionanodevices."
8. 2006 ORNL Users Meeting in Oak Ridge, TN, "Charge-directed targeting of antimicrobial protein-nanoparticle conjugates," [contributing author]
9. 2004, 69th Annual Meeting of SCEJ in Osaka, Japan, "Development of separation process of protein using metal-affinity immobilized liposome chromatography," [contributing author]

FUNDING

"Quantum mechanical transmission of electromagnetic signals in biological membranes" Air Force Office of Scientific Research LRIR, Role: Main Co-author and Co-PI, Funded at $855,000/3 Years (Oct 2013-2016).

"Activation of intracellular signaling pathways by nanosecond pulsed electric fields" Air Force Office of Scientific Research LRIR, Role: Contributing Author and Co-PI, Funded at $565,000/2 Years (Oct 2013-2015).

"Stimulated Raman photoacoustic imaging using atomic force microscopy for detection" Air Force Office of Scientific Research LRIR, Role: Author and Co-PI, Not funded (2012).

PROFESSIONAL SOCIETIES

- Microscopy Society of America: 2010-Present
- American Association for the Advancement of Science: 2012-2016
- Materials Research Society: 2006-2014
- SPIE: 2011-2014
- Optical Society of America: 2011-2014
- IEEE – Student Member: 2010-2012
- Society for Biomaterials – Student Member: 2005-2010
- Biomedical Engineering Society – Student Member: 2006-2008
- American Institute for Chemical Engineering – Student Member: 2000-2004
- Tau Beta Pi – Student Officer: 2002-2003

REVIEW OF JOURNAL PAPERS

- Bioelectromagnetics
- Biotechnology Progress
- Micron