

Curriculum Vitae

RESEARCH INTERESTS

- Design, develop and test hydrogel-based sensors for use in pharmaceutical process industry
- Design of micro-sensors considering physical, biological, mechanical and material constraints of devices and environment
 - Development of industry-transferrable techniques and process flow to build devices— includes electronic packaging and encapsulation schemes
 - Development of long-term test and characterization procedures in accelerated aging environment for fully integrated sensors, bench testing of components and assist in *in-field* device testing

EDUCATION

- Doctor of Philosophy**, Chemical Engineering
University of Utah, Salt Lake City, Utah May 2005
Dissertation: *Estimation of dielectric-film thickness and study of AC electrokinetics using planar interdigitated electrode array*
- Bachelor of Science**, Chemical Technology
Osmania University, Hyderabad, India Jun 1997

PROFESSIONAL EXPERIENCE

Founder & CTO, Applied Biosensors, LLC Jul 2014 Present

Research Associate Professor Jun 2013 Jun 2018
Department of Electrical Engineering, University of Utah, Salt Lake City

Research Assistant Professor Feb 2007 Jun 2013
Department of Electrical Engineering, University of Utah, Salt Lake City

- Led large teams of research associates and managed the fabrication of 'Utah micro-electrode arrays'
- Won three research grants as a PI/co-PI and multiple as key-personnel. PI/Co-PI on 1) Prof-X2 fellowship grant from Fraunhofer-Gesellschaft, Germany, 2) NIH R21 grant for development of hydrogel based implantable glucose sensors, 3) Seed grant from the U research foundation
- Led a team in making the fabrication processes meet GMP requirements for FDA approval of Utah microelectrode arrays
- Manager for the Fraunhofer Institute for reliability and integration (IZM) - Utah branch

Visiting Scientist Feb 2007 Oct 2008

- Fraunhofer-Institut für Biomedizinische Technik IBMT, St. Ingbert, Germany
- Developed Novel Technique for 3D machining bulk-silicon using wire EDM
 - Built ultra-high aspect ratio microelectrode arrays for neural recording and stimulation applications
 - Investigated biocompatibility of selected metals and epoxies *in-vitro*
 - Lectures: taught *Biomedical Microsystems* course at the University of Applied Sciences, Germany in Fall 2007 and at Saarland University in Spring 2008

Post Doctoral Fellow Aug 2005 Jan 2007
Department of Electrical Engineering, University of Utah, Salt Lake City

Microsystems laboratory

- **Led a team** of four research associates, developed and optimized processes using DOE to manufacture various modules of integrated wireless neural interface device
- **Developed** reliable metallization for **flipchip integration** of neural interface device
- **Fulfilled reporting requirements** of the government/industrial contracts and **published** journal articles and conference proceedings
- Submitted **grant proposals** through various mechanisms: NIH R01, NIH R21, NSF Fastlane, and fellowship grant from Fraunhofer (summaries provided upon request)

TEACHING EXPERIENCE

- Instructor: '*Sensors and Actuators*' graduate level, ECE, University of Utah, Fall 2011
- Instructor: '*Biomedical Microsystems*', graduate level, University of Applied Sciences, Saarland, Germany, Fall 2007
- Guest Instructor: '*Biomedical Microsystems*' graduate level, ECE, Saarland University, Spring 2008

PATENTS & DISCLOSURES

- T. Nguyen, J. Magda, P. Tathireddy, S-H Cho, An osmolarity-responsive hydrogel for continuous osmolarity monitoring with no pH interference. Invention ID: 5882, [*Licensed*] Prov.: Jan 2015; Conversion: Jan 2016
- V. Bhola, P. Tathireddy, Multi-analyte sensing using hydrogels and magnetometers, Provisional: 62/107,xxx, [*Licensed*] Prov.: Jan 2015; Conversion: Jan 2016
- V. Bhola, P. Tathireddy, S-H Cho, J. Magda, Process for synthesizing smart micro-scale polymeric structures, Invention ID: U-5734 Feb 2014
- N. Marrouche, F. Solzbacher, P. Tathireddy, Transveous sensor sheath for continuous blood components measurement, Invention ID: U-564t, [*Licensed*] PCT: Jul 2013; Filed in 8 countries, Oct 2015
- P. Tathireddy, F. Solzbacher, A Method to Manufacture Ultra High Aspect Ratio 3 Dimensional Penetrating Microelectrode Array with Customizable Lengths for Recording and Stimulation of Neuronal Signals in CNS and PNS, Invention ID: U-4417, [*Licensed*] Aug 2013
- P. Tathireddy, C. Mastrangelo, F. Solzbacher, Magnetic Sensing of Smart-Hydrogel Response, Invention ID: U-5555 PCT WO 201416XXXX A1, [*Licensed*] Sep 2012
- P. Tathireddy, L. Rieth, G. Clark, R.A.Norman, F. Solzbacher, S. Blair, Three-dimensional penetrating optical-electrical neural interface for selective stimulation and recording. Patent No. 20130046148, WO/2011/057276, App. No. PCT/US2010/056050, [*Licensed*] Dec 2011
- P.Tathireddy, J. Magda, S. Mohanty, Nanowires and smart-hydrogels based multi-analyte or stimulus microsensor. Invention ID: U-5222 Sep 2011
- P. Tathireddy, F. Solzbacher, High aspect ratio microelectrode arrays enabled to have customizable lengths and methods of making the same. Pub. No. WO/2009/149197, *International App. No. PCT/US2009/046150, [*Licensed*]* Oct 2009
- Three Dimensional Optical Stimulation and Electrical Recording Microelectrode Array for Neural Applications" DOCKET NO. 00846-U4655.PROV May 2009
- P. Tathireddy, F. Solzbacher, Performance-Test Platform for Integrated Wireless 3D Electrode Devices, Invention ID: U-4342, [*Licensed*] Jan 2008
- High aspect ratio microelectrode arrays enabled to have customizable lengths and methods of making the same DOCKET NO. 00846-U4409.PROV May 2008

RESEARCH SUPPORT

Current

- ECCS-140XXXX Roundy (PI) 10/1/2014 08/31/2018
Enabling Millimeter Scale Deeply Implanted Glucose Sensors through Ultrasonic Power Transfer and a Novel Glucose Sensing Mechanism
The goal of the proposed project is to enable a new mode for power transfer to and communication with a deeply implanted intraluminal glucose monitor. The current state of the art in integrated circuit and MEMS sensing technologies enables cubic mm size implementations of complex systems for implanted sensors.

Completed

- USTAR TAP 151XXX Tathireddy (PI) 07/1/2013 06/30/2017
Development of novel biosensor for continuous monitoring of multiple biomarkers and chemicals
The major goal of this project is to develop prototype sensors based on magnetic-hydrogels for glucose, pCO₂ and ionic strength.
- 1R43EB01XXXX-01A1 Tathireddy (PI) 07/01/2014 06/30/2016
Plasma-assisted atomic layer deposition of alumina and Parylene-C bi-layer encapsulation
The goal of this project is to develop new encapsulation schemes to improve the functional longevity of implantable medical devices. A novel bi-layer encapsulation scheme that combines Plasma Assisted Atomic Layer Deposited (PA-ALD) alumina layer underneath the Parylene layer is being studied. This encapsulation scheme, novel to biomedical field, will retain all the advantages of Parylene while utilizing vastly superior dielectric properties of underlying ALD alumina layer to create a much longer lasting and more electrically stable biomedical implants. This bi-layer encapsulation scheme may be seamlessly incorporated into our existing fabrication processes.
- 1P-132XXXX Tathireddy (PI) 07/01/2013 12/31/2015
Chronically implantable sensor array for optimal studies of human diseases in mouse models
The major goal of this project is to evaluate long-term performance of hydrogel based sensors in animal models. The sensors will be built to monitor selected biomarkers: glucose, pCO₂, osmolality (ionic strength) and pH.
- Title: Revolutionizing Prosthetics 2009: Phase III
Major Goal: Develop the world's first neuroprosthically controlled arm including wireless neural interfaces based on hybrid micro systems and integration technology
Agency: DARPA/DSO Role: Key Personnel
Award Period: 08/10 to 07/13
Budget: \$6,285,773 DC/year: \$2,000,000
- Title: Next Generation Wireless Neural Interfaces for Chronic and Acute Applications
Major Goal: Developing next generation neural interfaces and generating sound body of data and training schemes allowing FDA approval and dissemination into the research community
Agency: NIH/NINDS Role: Key Personnel
Award Period: 09/09 to 08/13 Budget: \$2,831,343 DC/year:
- Title: Fraunhofer IZM Branch Laboratory
Major Goal: Establishment of branch laboratory and joint research activities with two Fraunhofer Institutes with focus on system integration and biomedical applications.

- Agency: Fraunhofer Gesellschaft, Germany Role: Co Investigator
 Period: 08/10 to 012/13 Budget: \$200,000 DC/year: Award
- Title: Technology Commercialization Grant
 Major Goal: Development of pressure sensor and hydrogel based metabolic sensor system for biomedical applications
 Agency: USTAR/Technology Venture Development Role: Co-
 Investigator Award Period: 07/10 to 10/11 Budget: \$50,000 DC/year: Award
- Title: Chronic Microelectrode Recording Array
 Agency: NIH/NINDS Role: Key Personnel
 Award Period: 10/04 to 12/08 Budget: DC/year:
- Title: Revolutionizing Prosthetics
 Agency: DARPA/DSO Award: N66001-06-C-8005 Role: Key Personnel
 Award Period: 11/05 to 11/09 Budget: \$3.5M of \$13.8M DC/year:
- Title: Fraunhofer Profx2 Fellowship: Development of high aspect ratio 3D neural interface array for recording and stimulation applications
 Agency: Fraunhofer Gesellschaft, Germany Role: PI
 Award Period: 08/07 to 09/08 Budget: \$135,000 DC/year: \$135,000 (no F&A)
- Title: A chronically implantable microsensor array for monitoring biomarkers
 Major Goal: Development of pressure-sensor and hydrogel based implantable sensor for monitoring biomarkers
 Agency: NIH/NIBIB Award: Role: Key Personnel
 Award Period: 09/07 to 02/11 Budget: \$624,097 DC/year: N/A
- Title: USOAs. Developing Utah Slanted Optrode Arrays for Optical Stimulation of Neural Tissue
 Agency: VP of Research Role: Co-Investigator
 Award Period: 06/10 to 06/11 Budget: \$35,000 DC/year: N/A

INVITED LECTURES

- Saarland University, Saarbrücken, Germany Dec 4, 2007
- University of Technology, Dresden, Germany Mar 13, 2008
- The IET &IoN Seminar on Bionic Health:
 Next Generation Implants, Prosthetics and Devices Oct 1, 2009
- Panelist, 4th International Conference on Neuroprosthetic Devices
 Freiburg, Germany Nov 20, 2012

PUBLICATIONS (Total: 109 as of 2/18/2015)

Books and Book Chapters

- [1] P. Tathireddy, F. Solzbacher, R. Hitchcock, and K. P. Hoffmann, "Implantable Microsystems," in *Springer Handbook of Medical Technology*, ed, 2012, pp. 801-819.
 ISBN: 978-3-540-74657-7, ISBN: 978-3-540-74658-4,
 DOI: 10.1007/978-3-540-74658-4, 2011
- [2] P. Tathireddy, "Estimation of film thickness and study of AC electrokinetics using planar interdigitated electrode array," PhD Dissertation, The University of Utah, 2006.

Peer-reviewed Publications

2017:

1. T. Ngugen, J. Magda, P. Tathireddy, "Importance of Isoelectric Point in Determining the Shrinking Response of Polyampholytic Glucose-Sensitive Hydrogels" In review- Sensors and Actuators B.
2. R. Caldwell, H. Mandal, R. Sharma, F. Solzbacher, P. Tathireddy, L. Rieth, "Analysis of Al₂O₃ parylene C bilayer coatings and impact of microelectrode topography on long term stability of implantable neural arrays" In review, Journal of Neural Engineering

2015:

3. X. Xie, L. Rieth, R. Caldwell, S. Negi, R. Bhandari, R. Sharma, P. Tathireddy, F. Solzbacher, "Effect of bias voltage and temperature on lifetime of wireless neural interfaces with Al₂O₃ and parylene bilayer encapsulation," *Biomedical Microdevices*, vol. 17, pp. 1-8, 2015/01/23 2015.
4. K. N. Chappanda, Y. R. Smith, L. W. Rieth, P. Tathireddy, M. Misra, and S. K. Mohanty, "Effect of sputtering parameters on the morphology of TiO₂ nanotubes synthesized from thin Ti film on Si substrate," *IEEE Transactions on Nanotechnology*, vol. 14, pp. 18-25, 2015.
5. P. Tathireddy, R. Sharma, J. Magda, S. Cho, V. Bhola, T. Nguyen, "Sensor-array for continuous monitoring of biochemical for bioprocess control" *IEEE Transducers 2015*, Paper reference 2204.

2014:

1. X. Xie, L. Rieth, L. Williams, S. Negi, R. Bhandari, R. Caldwell, P. Tathireddy, F. Solzbacher, "Long-term reliability of Al₂O₃ and Parylene C bilayer encapsulated Utah electrode array based neural interfaces for chronic implantation," *Journal of neural engineering*, vol. 11, pp. 026016-026016, 2014.
2. X. Xie, L. Rieth, S. Negi, R. Bhandari, R. Caldwell, R. Sharma, P. Tathireddy, F. Solzbacher, "Self-aligned tip deinsulation of atomic layer deposited Al₂O₃ and parylene C coated Utah electrode array based neural interfaces," *Journal of Micromechanics and Microengineering*, vol. 24, p. 035003, 2014.
3. S. H. Cho, P. Tathireddy, L. Rieth, and J. Magda, "Effect of chemical composition on the response of zwitterionic glucose sensitive hydrogels studied by design of experiments," *Journal of Applied Polymer Science*, 2014.
4. K. N. Chappanda, Y. R. Smith, L. W. Rieth, P. Tathireddy, M. Misra, and S. K. Mohanty, "TiO₂ WO₃ Composite Nanotubes from Co Sputtered Thin Films on Si Substrate for Enhanced Photoelectrochemical Water Splitting," *Journal of The Electrochemical Society*, vol. 161, pp. H431-H437, 2014.
5. K. Chappanda, Y. Smith, P. Tathireddy, M. Misra, and S. Mohanty, "Effect of sputtering parameters on the morphology of TiO₂ nanotubes synthesized from thin Ti film on Si substrate," *Nanotechnology, IEEE Transactions on*, vol. 99, 2014.
6. T. V. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, and F. Solzbacher, "Deep-tissue light delivery via optrode arrays," *Journal of biomedical optics*, vol. 19, pp. 015006-015006, 2014.

Conference Proceedings:

7. S. H. Cho, J. Magda, P. Tathireddy, L. Rieth, "Effect of composition changes on sensitivity of glucose sensitive hydrogels studied by design of experiments," 247th ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014. Pages PMSE-322.
8. X. Xie, L. W. Rieth, R. Sharma, S. Negi, R. Bhandari, R. Caldwell, P. Tathireddy, F. Solzbacher, "Atomic Layer Deposited Al₂O₃ and Parylene C Bi-layer Encapsulation for Utah Electrode Array Based Neural Interfaces," in *MRS Proceedings*, 2014, pp. mrsf13-1621-j07-05.
9. T. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, and F. Solzbacher, "Implantable glass optrodes for deep-tissue light delivery," in *Optical MEMS and Nanophotonics (OMN), 2014 International Conference on*, 2014, pp. 163-164.

2013:

1. Xie, X., Rieth, L., Negi, S., Bhandari, R., Caldwell, R., Sharma, R., ... & Solzbacher, F. (2014). Self-aligned tip deinsulation of atomic layer deposited Al₂O₃ and parylene C coated Utah electrode array based neural interfaces. *Journal of Micromechanics and Microengineering*, 24(3), 035003.
2. J. M. Yoo, S. Negi, P. Tathireddy, F. Solzbacher, J. I. Song, and L. W. Rieth, "Excimer laser deinsulation of Parylene-C on iridium for use in an activated iridium oxide film-coated Utah electrode array," *J Neurosci Methods*, vol. 215, pp. 78-87, Apr 30 2013.
3. X. Xie, L. Rieth, R. Caldwell, M. Diwekar, P. Tathireddy, R. Sharma, and F. Solzbacher, "Long-Term Bilayer Encapsulation Performance of Atomic Layer Deposited Al₂O₃ and Parylene C for Biomedical Implantable Devices," *Biomedical Engineering, IEEE Transactions on*, vol. 60, pp. 2943-2951, 2013.
4. H. A. C. Wark, R. Sharma, K. S. Mathews, E. Fernandez, J. Yoo, B. Christensen, P. Tresco, L. Rieth, F. Solzbacher, R. A. Normann, and P. Tathireddy, "A new high-density (25 electrodes/mm²) penetrating microelectrode array for recording and stimulating sub-millimeter neuroanatomical structures," *Journal of Neural Engineering*, vol. 10, 2013.
5. P. Tathireddy, L. Rieth, G. Clark, R. Normann, F. Solzbacher, and S. Blair, "Three Dimensional Penetrating Optical-Electrical Neural Interface for Selective Stimulation and Recording," 20130046148, 2013.
6. T. V. F. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, G. A. Clark, and F. Solzbacher, "Glass Optrode Arrays for Optogenetic Stimulation," in *Optogenetics: Optical Methods for Cellular Control*, 2-3 Feb. 2013, USA, 2013, p. 8586oV (5 pp.).
7. M. Guenther, G. Gerlach, T. Wallmersperger, M. N. Avula, S. H. Cho, X. Xie, B. V. Deveney, F. Solzbacher, P. Tathireddy, J. J. Magda, C. Scholz, R. Obeid, and T. Armstrong, "Smart Hydrogel-Based Biochemical Microsensor Array for Medical Diagnostics," *Advances in Science and Technology*, vol. 85, pp. 47-52, 2013.
8. Bates, J., Tathireddy, P., Bueteffisch, S., & Magda, J. (2013). An Improved Design for Chemomechanical Sensors: A Piezoresistive Pressure Sensor with a Mechanical Boss. *Chemosensors*, 1(3), 33-42.

Conference Proceedings:

9. J.S. Bates, S.H. Cho, P. Tathireddy, L.W. Rieth, J.J. Magda, "Smart Hydrogels Designed for use in Microfabricated Sensor Arrays" *MRS Online Proceedings Library* 1570, mrs13-1570-ppo6-o3, 2013.
10. T. V. F. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, G. A. Clark, and F. Solzbacher, "Optrode arrays for infrared neural stimulation," in *Photonic Therapeutics and Diagnostics IX, February 2, 2013 - February 7, 2013*, San Francisco, CA, United states, 2013, pp. The Society of Photo-Optical Instrumentation Engineers (SPIE).
11. Xie, X., Rieth, L., Caldwell, R., Sharma, R., Yoo, J. M., Diwekar, M., ... & Solzbacher, F. (2013, June). Bi-layer encapsulation of utah array based neural interfaces by atomic layer deposited Al₂O₃ and parylene C. In *Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS & EUROSENSORS XXVII), 2013 Transducers & Eurosensors XXVII: The 17th International Conference on* (pp. 1267-1270). IEEE.
12. Xie, X., Rieth, L., Tathireddy, P., & Solzbacher, F. (2013, June). Atomic layer deposited Al₂O₃ and parylene C dual-layer encapsulation for biomedical implantable devices. In *Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS & EUROSENSORS XXVII), 2013 Transducers & Eurosensors XXVII: The 17th International Conference on* (pp. 1044-1047). IEEE.
13. Abaya, T. V. F., Diwekar, M., Blair, S., Tathireddy, P., Rieth, L., & Solzbacher, F. (2013, August). Implantable devices for optical neural interfaces. In *Optical MEMS and Nanophotonics (OMN), 2013 International Conference on* (pp. 97-98). IEEE.
14. Abaya, T. V. F., Diwekar, M., Blair, S., Tathireddy, P., Rieth, L., Clark, G. A., & Solzbacher, F. (2013, March). Glass optrode arrays for optogenetic stimulation. In *SPIE BiOS* (pp. 8586oV-8586oV). International Society for Optics and Photonics.
15. S.H. Cho, P. Tathireddy, L.W. Rieth, J.J. Magda, "Polymerization and characterization of molecularly imprinting polymer particle for sensing glutathione" *245th ACS National Meeting & Exposition*, New Orleans, LA, United States, April 7-11, 2013 (2013), PMSE-507.

16. S.H. Cho, P. Tathireddy, L.W. Rieth, S. Mohanty, J.J. Magda, "Molecularly Imprinted Polymer using the Interaction of Co_2^+ and Glutathione for a Glutathione Sensor " *2013 MRS fall meeting & exhibit*, Boston, Massachusetts, United States, December 1-6, 2013

2012 and older

1. T. V. F. Abaya, S. Blair, P. Tathireddy, L. Rieth, and F. Solzbacher, "A 3D glass optrode array for optical neural stimulation," *Biomed. Opt. Express*, vol. 3, pp. 3087-3104, 2012.
2. X. Xie, L. Rieth, S. Merugu, P. Tathireddy, and F. Solzbacher, "Plasma-assisted atomic layer deposition of Al_2O_3 and parylene C bi-layer encapsulation for chronic implantable electronics," *Applied Physics Letters*, vol. 101, p. 093702, 2012.
3. J.-M. Yoo, J.-I. Song, P. Tathireddy, F. Solzbacher, and L. W. Rieth, "Hybrid laser and reactive ion etching of Parylene-C for deinsulation of a Utah electrode array," *Journal of Micromechanics and Microengineering*, vol. 22, p. 105036, 2012.
4. T. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, G. Clark, and F. Solzbacher, "Characterization of a 3D optrode array for infrared neural stimulation," *Biomedical Optics Express*, vol. 3, pp. 2200-2219, 2012.
5. X. Xie, L. Rieth, S. Merugu, P. Tathireddy, and F. Solzbacher, "Plasma-assisted atomic layer deposition of Al_2O_3 and parylene C bi-layer encapsulation for chronic implantable electronics," *Applied Physics Letters*, vol. 101, pp. 093702-093702-5, 2012.
6. K. N. Chappanda, Y. R. Smith, S. K. Mohanty, L. W. Rieth, P. Tathireddy, and M. Misra, "Growth and characterization of TiO_2 nanotubes from sputtered Ti film on Si substrate," *Nanoscale research letters*, vol. 7, p. 388, 2012.
7. J. M. Yoo, A. Sharma, P. Tathireddy, L. W. Rieth, F. Solzbacher, and J. I. Song, "Excimer-laser deinsulation of Parylene-C coated Utah electrode array tips," *Sensors and Actuators, B: Chemical*, vol. 166-167, pp. 777-786, 2012.
8. A. Sharma, L. Rieth, P. Tathireddy, R. Harrison, H. Oppermann, M. Klein, M. Töpper, E. Jung, R. Normann, G. Clark, and F. Solzbacher, "Long term in vitro functional stability and recording longevity of fully integrated wireless neural interfaces based on the Utah Slant Electrode Array," *J Neural Eng*, vol. 8, 2011.
9. F. Horkay, S. H. Cho, P. Tathireddy, L. Rieth, F. Solzbacher, and J. Magda, "Thermodynamic Analysis of the Selectivity Enhancement Obtained by Using Smart Hydrogels That Are Zwitterionic When Detecting Glucose With Boronic Acid Moieties," *Sensors and Actuators B: Chem*, vol. 160, pp. 1363-1371, Dec 15 2011.
10. A. Sharma, L. Rieth, P. Tathireddy, R. Harrison, H. Oppermann, M. Klein, M. Töpper, E. Jung, R. Normann, G. Clark, and F. Solzbacher, "Evaluation of the packaging and encapsulation reliability in fully integrated, fully wireless 100 channel Utah Slant Electrode Array (USEA): Implications for long term functionality," *Sensors and Actuators A: Physical*, 2011.
11. G. Lin, S. Chang, H. Hao, P. Tathireddy, M. Orthner, J. Magda, and F. Solzbacher, "Osmotic swelling pressure response of smart hydrogels suitable for chronically implantable glucose sensors," *Sensors and Actuators B: Chemical*, vol. 144, pp. 332-336, 2010.
12. A. Sharma, L. Rieth, P. Tathireddy, R. Harrison, and F. Solzbacher, "Long term in vitro stability of fully integrated wireless neural interfaces based on Utah slant electrode array," *Applied Physics Letters*, vol. 96, p. 073702 (3 pp.), 2010.
13. J. J. Magda, G. Lin, P. Tathireddy, M. Orthner, F. Solzbacher, V. Schulz, and M. Guenther, "Confined Smart Hydrogels for Applications in Chemomechanical Sensors for Physiological Monitoring," *MRS Proceedings*, vol. 1234, 2009.
14. V. Schulz, M. Guenther, G. Gerlach, J. J. Magda, P. Tathireddy, L. Rieth, and F. Solzbacher, "In-vitro investigations of a pH-and ionic-strength-responsive polyelectrolytic hydrogel using a piezoresistive microsensor," *Smart structures and materials. Nondestructive evaluation for health monitoring and diagnostics*, vol. 7287, 2009.
15. D. Rakwal, S. Heamawatanachai, P. Tathireddy, F. Solzbacher, and E. Bamberg, "Fabrication of

- compliant high aspect ratio silicon microelectrode arrays using micro-wire electrical discharge machining," *Microsystem technologies*, vol. 15, pp. 789-797, 2009.
16. J. M. Hsu, L. Rieth, R. A. Normann, P. Tathireddy, and F. Solzbacher, "Encapsulation of an integrated neural interface device with parylene C," *IEEE Transactions on Biomedical Engineering*, vol. 56, pp. 23-29, 2009.
 17. S. Kim, R. Bhandari, M. Klein, S. Negi, L. Rieth, P. Tathireddy, M. Toepper, H. Oppermann, and F. Solzbacher, "Integrated Wireless Neural Interface Based on the Utah Electrode Array," *Biomedical Microdevices*, vol. 11, pp. 453-466, 2009.
 18. P. Tathireddy, Y. H. Choi, and M. Skliar, "Particle AC electrokinetics in planar interdigitated microelectrode geometry," *Journal of Electrostatics*, vol. 66, pp. 609-619, 2008.
 19. S. Kim, K. Zoschke, M. Klein, D. Black, K. Buschick, M. Toepper, P. Tathireddy, R. Harrison, H. Oppermann, and F. Solzbacher, "Switchable polymer-based thin film coils as a power module for wireless neural interfaces," *Sensors and Actuators A (Physical)*, vol. 136, pp. 467-74, 2007.
 20. J.-M. Hsu, P. Tathireddy, L. Rieth, R. A. Normann, and F. Solzbacher, "Characterization of a-SiCx:H thin films as an encapsulation material for integrated silicon based neural interface devices," *Thin Solid Films*, vol. 516, pp. 34-41, 2007.
 21. S. Kim, P. Tathireddy, R. A. Normann, and F. Solzbacher, "Thermal impact of an active 3-D microelectrode array implanted in the brain," *IEEE Trans Neural Syst Rehabil Eng*, vol. 15, pp. 493-501, Dec 2007.
 22. P. Tathireddy, Y. H. Choi, and M. Skliar, "Method for measuring thickness of dielectric films using microdielectric fringe-effect sensors," *Analytical Chemistry*, vol. 78, pp. 3242-3248, 2006.
 23. M. Skliar and P. Tathireddy, "Approximation of evolutionary system using singular forcing," *Computers and Chemical Engineering*, vol. 26, pp. 1013-1021, 2002.

Conference Proceedings

24. H. Basaeri, D. Christensen, S. Roundy, Y. Yu, T. Nguyen, P. Tathireddy, D. Young, "Ultrasonically powered hydrogel-based wireless implantable glucose sensor" SENSORS, 2016 IEEE.
25. Y. Yu, T. Nguyen, P. Tathireddy, D. Young, S. Roundy, "Wireless hydrogel-based glucose sensor for future implantable applications", SENSORS, 2016 IEEE.
26. G. A. Clark, S. L. Schister, N. M. Ledbetter, D. J. Warren, F. Solzbacher, J. D. Wells, M. D. Keller, S. M. Blair, L. W. Rieth, and P. R. Tathireddy, "Selective, high-optrode-count, artifact-free stimulation with infrared light via intrafascicular Utah Slanted Optrode Arrays," in Proceedings of SPIE, 2012, p. 82075I.
27. T. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, G. Clark, and F. Solzbacher, "Optical characterization of the Utah slant optrode array for intrafascicular infrared neural stimulation," in Proceedings of SPIE, 2012, p. 82075M.
28. T. V. F. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, and F. Solzbacher, "3D Waveguide Penetrating Arrays for Optical Neural Stimulation," in Optical MEMS and Nanophotonics, Banff, Alberta, Canada, 2012.
29. K. Chappanda, Y. Smith, S. Mohanty, L. Rieth, and P. Tathireddy, "Growth and Characterization of Thin Film Titania Nanotubes on Silicon Substrates," in Oral presentation: Spring MRS Conference, San Francisco, CA, 2012.
30. H. A. Wark, R. Sharma, K. S. Mathews, R. A. Normann, and T. P., "A High-Density Utah Slanted Electrode Array For Neuromodulation Of Sub-Millimeter Neuroanatomical Structures," in IFESS 2012 (International Functional Electrical Stimulation Society), Banff, Alberta, Canada, 2012.
31. X. Xie, L. Rieth, R. Sharma, J. Yoo, P. Tathireddy, and F. Solzbacher, "Atomic layer deposited Al₂O₃ and Parylene C bi-layer encapsulation for neural interfaces based on Utah array," in SfN (Society for Neuroscience) 2012, New Orleans, LA, 2012.
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49. L. W. Rieth, A. Sharma, S. Kim, P. Tathireddy, R. Kier, R. Harrison, R. Normann, G. Clark, and F. Solzbacher, "Recent progress on fully integrated wireless neural interfaces based on the Utah electrode array. Program 370.6.," in Society for Neuroscience, 2009.
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 53. S. Kim, P. Tathireddy, R. A. Normann, and F. Solzbacher, "In vitro and in vivo study of temperature increases in the brain due to a neural implant," in 2007 3rd International IEEE/EMBS Conference on Neural Engineering, 2-5 May 2007, Piscataway, NJ, USA, 2007, p. 4 pp.
 54. P. Tathireddy, Y.-H. Choi, and M. Skliar, "Method For Measuring Thickness Of Dielectric Films Using Microdielectric Fringe-Effect Sensors," in Oral Presentation: AICHE (American Institute of Chemical Engineers), Salt Lake City, UT, 2007.
 55. P. Tathireddy, S. Chakravarthy, J. Hsu, M. Klein, H. Oppermann, L. Rieth, R. Harrison, R. A. Normann, and F. Solzbacher, "Biocompatible hybrid system integration of silicon based neural interface devices," in 2006 NSTI Nanotechnology Conference and Trade Show, Boston, MA, United states, 2006, pp. 357-360.
 56. S. Kim, K. Buschick, K. Zoschke, M. Klein, M. Toepper, D. Black, R. Harrison, P. Tathireddy, and F. Solzbacher, "Polymer based thin film coils as a power module of wireless neural interfaces," in 2006 IEEE Workshop on Microelectronics and Electron Devices, 14 April 2006, Piscataway, NJ, USA, 2006, p. 2 pp.
 57. M. Töpper, M. Klein, K. Buschick, V. Glaw, K. Orth, O. Ehrmann, M. Hutter, H. Oppermann, K.-F. Becker, T. Braun, S. Kim, P. Tathireddy, S. Chakravarty, and F. Solzbacher, "Biocompatible Hybrid Flip Chip Microsystem Integration for Next Generation Wireless Neural Interfaces," in Proceedings of the 55th Electron Compon Tech Conf San Diego, CA, 2006.

Abstracts and Poster presentations

58. K. Mathews, H. Wark, P. Tathireddy, R. Sharma, and R. Normann, "Acute intrafascicular recordings from high density microelectrode array (25 electrodes/mm²) in rat sciatic nerve," presented at the Neural Interfaces Conference, Salt Lake City, 2012.
59. H. Wark, R. Sharma, E. Fernandez, K. Mathews, R. Normann, and P. Tathireddy, "Evaluation of a new high density (25 electrodes/mm²) penetrating microelectrode array for sub-millimeter neuroanatomical structures," presented at the Neural Interfaces Conference, Salt Lake City, UT, USA, 2012.
60. D. Warren, A. Smith, R. Harrison, L. Rieth, P. Tathireddy, G. Clark, and F. Solzbacher, "Telecommand and telemetry design improvements to wireless integrated neural interface-recording devices," presented at the Neural Interfaces Conference, Salt Lake City, UT, USA, 2012.
61. P. Deshpande, D. Warren, L. Rieth, P. Tathireddy, and F. Solzbacher, "A study of coils for integrated wireless communication," presented at the Neural Interfaces Conference, Salt Lake City, UT, USA, 2012.
62. L. Rieth, R. Franklin, P. Tathireddy, R. Sharma, L. Williams, F. Tenore, M. Töpper, H. Oppermann, R. Harrison, and F. Solzbacher, "Utah electrode arrays with integrated electronics for controlling high degree of freedom neuroprosthetics," presented at the Neural Interfaces Conference Salt Lake

- City, UT, USA, 2012.
63. J. Yoo, P. Tathireddy, F. Solzbacher, and L. Rieth, "Laser deinsulation method of Parylene-C coated Utah electrode array," presented at the Neural Interfaces Conference, Salt Lake City, UT, USA, 2012.
 64. B. Baker, R. Sharma, P. Tathireddy, L. Rieth, and F. Solzbacher, "Flexible Utah electrode array for application in neural interfaces," presented at the Neural Interface Conference, Salt Lake City, UT, USA, 2012.
 65. X. Xie, L. Rieth, R. Sharma, J. Yoo, P. Tathireddy, and F. Solzbacher, "Atomic layer deposited Al₂O₃ and parylene c bi-layer encapsulation for neural interfaces based on Utah array," presented at the Neural Interface Conference, Salt Lake City, UT, USA, 2012.
 66. T. Abaya, N. Ledbetter, D. Warren, M. Diwekar, F. Solzbacher, J. Wells, Keller, L. Rieth, P. Tathireddy, S. Blair, and G. Clark, "Selective artifact-free stimulation with infrared light via intrafascicular Utah slanted optrode arrays," presented at the Neural Interfaces Conference, Salt Lake City, UT, USA, 2012.
 67. T. Abaya, M. Diwekar, P. Tathireddy, L. Rieth, F. Solzbacher, S. Blair, and G. Clark, "Fabrication and characterization of optrode arrays for optical neural stimulation," presented at the Neural Interfaces Conference, Salt Lake City, UT, USA, 2012.
 68. T. V. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth, and F. Solzbacher, "Fabrication of a 3D Glass Optrode Array for Optical Neural Stimulation," presented at the MRS-Spring Meeting, San Francisco, CA, 2012.
 69. M. DIWEKAR, T. V. F. ABAYA, P. TATHIREDDY, L. RIETH, F. SOLZBACHER, S. BLAIR, and G. A. CLARK, "Development of optrode arrays for optical neural stimulation," presented at the Neuroscience 2012, New Orleans, Louisiana, 2012.
 70. X. Xie, L. Rieth, S. Merugu, P. Tathireddy, and F. Solzbacher, "Investigation of novel ALD AL₂O₃-parylene bi-layer encapsulation for neural interfaces," presented at the Neuroscience, Washington DC, 2011.
 71. M. Diwekar, T. V. Abaya, P. Tathireddy, L. Rieth, F. Solzbacher, S. Blair, and G. A. Clark, "Development of the Utah slant optrode array for optical neural stimulation," presented at the Neuroscience, Washington DC, USA, 2011.
 72. G. A. Clark, S. Schister, N. M. Ledbetter, D. J. Warren, F. Solzbacher, J. D. Wells, M. D. Keller, S. M. Blair, L. Rieth, and P. Tathireddy, "Selective, high-channel-count, artifact-free stimulation with infrared light via intrafascicular Utah slanted optrode arrays," presented at the Neuroscience, Washington DC, USA, 2011.
 73. P. Tathireddy, R. Sharma, E. Bamberg, L. Rieth, J. J. Martinez, A. D. Dorval, J. White, and F. Solzbacher, "High aspect ratio Utah microelectrode array for neural interface applications," presented at the Neuroscience, Washington DC, USA, 2011.
 74. M. Diwekar, S. Merugu, T. V. F. Abaya, P. Tathireddy, L. Rieth, S. Blair, and F. Solzbacher, "Development of polymer utah slant optrode arrays for optical neural stimulation," presented at the Nanoutah, 2011.
 75. G. Clark, S. Schister, N. Ledbetter, D. Warren, F. Solzbacher, J. Wells, M. Keller, S. Blair, L. Rieth, and P. Tathireddy, "Selective, high-channel-count, artifact-free stimulation with infrared light via intrafascicular Utah Slanted Optrode Arrays," presented at the Neuroscience 2011, Washington DC, 2011.
 76. P. Tathireddy, L. Rieth, A. Sharma, M. Wilke, M. Toepper, and F. Solzbacher, "Silicon lid for hermetic encapsulation of electronics on implantable systems," presented at the Nanotech, Anaheim, CA, USA, 2010.
 77. P. Tathireddy, A. Sharma, L. Rieth, M. Topper, H. Oppermann, and F. Solzbacher, "Latest developments in wireless neural interfaces," presented at the Neurotalk, Singapore, 2010.
 78. A. Sharma, L. Rieth, P. Tathireddy, R. Harrison, H. Oppermann, M. Klein, M. Töpper, E. Jung, R. Normann, G. Clark, and F. Solzbacher, "Long term in-vitro functional stability and recording longevity of fully integrated wireless neural interfaces based on Utah Slant Electrode Array (USEA)," presented at the NIH Neural Interface Conference, Long Beach, CA, USA, 2010.

79. P. Tathireddy, L. Rieth, A. Sharma, and F. Solzbacher, "Implantable microsystems and neuro electronic interfaces," London, 2009.
80. S. Kim, P. Tathireddy, L. Rieth, R. Harrison, R. A. Normann, F. Solzbacher, M. Klein, M. Toepper, and H. Oppermann, "Wireless Integrated Neural Interface Device for Chronic Neural Signal Recording," presented at the 3rd Annual Mountain West Biomedical Engineering Conference, Park City, UT, USA, 2007.
81. J. Hsu, P. Tathireddy, L. Rieth, S. Kammer, K. P. Koch, R. A. Normann, and F. Solzbacher, "PECVD A-SiC:H Encapsulation For Chronically Implanted Neural Recording Devices," presented at the Materials Research Society Conference, San Francisco, CA, USA, 2006.
82. M. Toepper, M. Klein, H. Oppermann, P. Tathireddy, L. Rieth, F. Solzbacher, and H. Reichl, "Wafer Level Packaging based on Electroplating for Medical Implantable Devices," presented at the PEAKS Conference on Electrochemical Processing for Microelectronics, Whitefish, MT, USA, 2006.
83. M. Töpper, S. Kim, P. Tathireddy, M. Hutter, M. Klein, K. Buschick, V. Glaw, K. Orth, O. Ehrmann, H. Oppermann, K.-F. Becker, F. Solzbacher, and H. Reichl, "Biocompatible SiP based on microsystem integration for wireless neural interfaces," presented at the Second International Workshop on SOP, SIP, SOC (3S) Electronics Technologies, Atlanta, GA, 2006.
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85. F. Solzbacher, M. Toepper, L. Rieth, P. Tathireddy, S. Kim, M. Klein, and H. Reichl, "Chronic In Vivo Recordings with a New Implantable Wireless Neural Recording Array," presented at the NIH/NINDS Neural Interfaces Workshop, Bethesda, MD, USA, 2006.
86. P. Tathireddy and M. Skliar, "Electrically-Induced Structure formation in Aqueous Suspension of Nanosized Polystyrene Spheres," presented at the Annual Conference of American Institute of Chemical Engineers, Los Angeles, CA, USA, 2000.

MEDIA

- Video: National Science Foundation Biotech's future series: Oct 2014
https://www.youtube.com/watch?v=yH04SJ5_WU&spfreload=10
- ITIA Magazine: Tungsten in Life and Medicine, pg 14.
- "Micro Man/Machine Interface" Featured article in *MicroMachining* monthly magazine May/June 2008, pp 22-25
- Image of a research result on the cover of the Annual Micromachining Conference proceedings 21-22 Oct 2008, Coventry, UK

ACHIEVEMENTS AND AFFILIATIONS

- Recipient of prestigious 'Outstanding researcher and scientist fellowship award 2007' from Fraunhofer-Gesellschaft, Germany
- Graduated in the First class with distinction/honors at the university level with bachelor's degree
- Passed Fundamentals of Engineering exam, thereby bypassed the Master's program
- Competent Toastmaster (CTM) at the Toastmasters International and an active member
 - Served as a member of the executive board during the year 2006-2007

- Chartered environmentalist and life member - certified by the Environmental Protection Society
- Memberships/Associations with professional scholarly societies
 - IEEE Member since 2007
 - International Functional Electrical Stimulation Society (IFESS) since 2007
 - Neuroscience member since 2010

SERVICES

- Member: Academic Policy Advisory Committee, University of Utah (2011-2014)
- NIH/NIDDK SRC Reviewer special emphasis panel (2013- present)
- NSF SBIR Grant Application Technical Review Panel (2015- present)
- Journal & Conference Paper Reviewer
 - *Journal of Electrostatics*
 - *Sensors and Actuators B: Chemical*
 - *IEEE Journal of Microelectromechanical Systems*
 - *Annals of Biomedical Engineering*
 - *IEEE Engineering in Medicine and Biology Society (EMBS)*
 - *IEEE Components, Packaging and Manufacturing Technologies (CPMT)*
 - *Journal of Neural Engineering*
- Member of graduate student advisory committee at the U for 2 years from August 2001 to August 2003
- Judge: Judge at the Salt Lake Valley Science and Engineering Fair, Salt Lake City, (2009, 2010, 2011)
- Engineering lab tours to local high-school students in summers (2010, 2011)
- Consulting: Viteris Technologies, Salt Lake City, UT (2011-current)
- Consulting: Touchdown Technologies, Baldwin Park, CA (2012-current)
- Consulting: Blackrock Microsystems, Salt Lake City, UT (2008-current)
- Co-advised and mentored over 20 students

MENTORING AND CO-ADVISING

Post-docs

- [1] Asha Sharma, 01/2009 – 03/2011, Electrical and Computer Engineering, University of Utah
- [2] Srinivas Merugu, 07/2010 – 04/2012, Electrical and Computer Engineering, University of Utah
- [3] Mohit Diwekar, 12/2010 – 2013, Electrical and Computer Engineering, University of Utah

Graduate Students (Co-advisor, mentor)

- [1] Vishal Bhola, 08/2013 – 12/2014, M.S, Electrical and Computer Engineering, University of Utah

- [2] Seung Hei Cho, 08/2008 – 05/2014, Ph.D, Chemical Engineering, University of Utah
- [3] Ryan Caldwell, 2014-2017, Ph.D candidate, Electrical and Computer Engineering, University of Utah
- [4] Peng Wang, 2014-2017, Ph.D candidate, Electrical and Computer Engineering, University of Utah
- [5] Ronnie Boutte, 08/2012 – 01/2018, Ph.D candidate, Electrical and Computer Engineering, University of Utah
- [6] Jiyoung Son, 2014-2017, PhD Candidate, Electrical and Computer Engineering, University of Utah
- [7] Hamid Basaeri, 2016-current, PhD Candidate, Mechanical Engineering, University of Utah
- [8] Yuechuan Yu, 2016- current, PhD Candidate, Electrical and Computer Engineering, University of Utah

Student Projects, Senior projects (Graduated students)

- [1] Aaron Pierce, graduated 2012, B.S, Electrical and Computer Engineering, University of Utah
- [2] Genyao Lin, graduated 2010, Ph.D, Chemical Engineering, University of Utah
- [3] Michael Orthner, graduated 2009, Ph.D, Electrical and Computer Engineering, University of Utah
- [4] Chola Verma, graduated 2007, M.S, Electrical and Computer Engineering, University of Utah
- [5] Nora Busche, 08/2010 – 05/2011, M.S, Electrical Engineering, Technical University of Berlin, Berlin Germany
- [6] Stefan Raatz, 01/2011 – 07/2011, M.S, Electrical Engineering, Technical University of Berlin, Berlin Germany
- [7] Karumbaiah Chappanda Nanaiah, 08/2010-2013, Ph.D, Electrical and Computer Engineering, University of Utah
- [8] Tanya Abaya, current, 08/2009 – 2013, Ph.D, Electrical and Computer Engineering, University of Utah
- [9] Rajesh Surapaneni, 08/2009- 2013, Ph.D, Electrical and Computer Engineering, University of Utah
- [10] Pranali Deshpande, 08/2011 – 2013, M.S, Electrical and Computer Engineering, University of Utah
- [11] Jeffrey Scott Bates, 08/2010 – 2013, Ph.D, Material Science and Engineering, University of Utah