
BIOGRAPHICAL SKETCH

NAME: Saleh Ramezani

POSITION TITLE: Graduate Research Assistant

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	COMPLETION DATE	FIELD OF STUDY
Louisiana Tech University, Ruston	B.S	05/2008	Biomedical Engineering
Louisiana Tech University, Ruston	M.S	05/2011	Biomedical Engineering

A. Personal Statement

I am passionate about the opportunity to do research in an interdisciplinary group and solve problems that impact the medical community in a positive manner. I chose biomedical engineering as my undergraduate major because I was fascinated by the application of engineering in medicine. My first exposure to research was as an undergraduate at Louisiana Tech University, where I worked on a nanoparticle drug delivery project. My graduate research involved the design of a computational neural model for a sub-region of the hippocampus. As a research assistant in the Preclinical Nuclear Imaging Laboratory at UT Southwestern, I participated in a broad range of translational studies. In Dr. Xiankai Sun's laboratory, learned the essential skills for carrying out preclinical PET, CT, SPECT, and MRI experiments. My current research in Drs. Farach-Carson and Bhattacharya builds logically upon my prior research experiences. The aims of my research are to 1) build an expanded cell surface marker antibody library for targeted hyperpolarized (HP) imaging that will recognize a majority, if not all, colorectal cancer (CRC) lesions, and 2) perform proof-of-concept experiments to demonstrate specific targeting and signal enhancement of CRC lesions using novel dually targeted HA hydrogel particles containing an imaging payload of HP Silica or Silicon nanoparticles.

B. Positions and Honors
Positions and Employment

2007 Clinical Engineering Intern, Glenwood Hospital, West Monroe, LA
 2008-2011 Graduate Research Assistant, Louisiana Tech University, Ruston, LA
 2012-2013 Research Assistant I, UT Southwestern Medical Center, Dallas, TX
 2013-2015 Research Assistant II, UT Southwestern Medical Center, Dallas, TX
 2015-Present Graduate Research Assistant, GSBS, Houston, TX

Other Experience and Professional Memberships

2008,2011 Magna cum laude (B.S, M.S.)
 2006 President of Pi Mu Epsilon (Mathematics Honor Society)
 2006 William Ardis Marbury, Sr. Distinguished Biomedical Scholar Award, 2006
 2007-08 Member, Tau Beta Pi (Engineering Honor Society)
 2007-08 Member, Alpha Eta Mu Beta (Biomedical Engineering Honor Society)
 2007-08 Member, Phi Kappa Phi Honor Society
 2007-11 Web Designer for Alpha Epsilon Delta, Biomedical Engineering Society, and Gamma Beta Phi
 2006-2008 Math tutor for Pi Mu Epsilon
 2012, 2013 Mentored two undergraduate students in a research project at UT Southwestern

C. Contribution to Science

1. My first exposure to research was during my third year as an undergraduate at Louisiana Tech University. I worked in Dr. Patrick O'Neal's lab on a targeted drug delivery project where I learned to use the layer-by-layer self-assembly of polyelectrolytes to coat the surface of silica nanoparticles. The objective of this project was to improve the biocompatibility and optical properties of a drug delivery system. I continued to work on

this project during my senior year where I led a team of five students to encapsulate and coat a therapeutic viral agent with liposomes and polyelectrolytes. The collaborative experience with investigators from Louisiana State University Health Science Center (LSUHSC), the challenge of leadership, and the atmosphere of innovation at Louisiana Tech University made this research a phenomenal experience. This project spawned my interest in biomedical research and I decided to pursue a graduate degree in biomedical engineering.

2. My Master's project involved the design of a single cell oscillatory neural model for the CA3 region of the hippocampus. The neuronal assemblies in the CA3 region exhibit endogenous rhythmicity and can be represented with non-linear differential equations capable of generating oscillations. Our proposed model was a generalization of the Winfree oscillator, consisting of a ring which could evolve in phase as well as in amplitude, and a mapper which shaped the observable output waveform of the ring. I developed a mathematical model of Glutamatergic (AMPA and NMDA) and GABAergic (GABA_A) receptors and neurotransmitter release probability in this model. Furthermore, I designed networks of interconnected neurons and simulated the neuronal network activity under various physiological conditions such as different extracellular magnesium concentration, intrinsic frequencies, and coupling strengths. I used MATLAB entirely throughout this research for modeling and simulations of neural networks. Additionally, I performed in-vivo electrophysiology recordings for validation of the simulation results, published my findings, and presented my work at a national conference.
 - a. **S. Ramezani**, W. Chen, and A.W.L. Chiu, "Analysis of Glutamatergic and GABAergic Receptor Dynamics in Coupled Oscillator Neural Model.", *Journal of Modeling and Simulation* Vol. 33, No. 3, 2013
 - b. **S. Ramezani** and A.W.L. Chiu, "Glutamate receptor dynamics in coupled oscillator model: A preliminary analysis of network complexity", Abstract Supplement for the BMES Annual Fall Meeting, Hartford, CT. (October 2011).
 - c. **S. Ramezani**, Wu Chen, Alan Chiu, "Multi-scale oscillator based modeling: From single cell to hippocampal slice activities". Louisiana Biomedical Research Network 9th Annual Meeting, Shreveport, LA. (January 2011).

3. During my first year of employment at UT Southwestern, I worked independently on a pharmacokinetics (PK) modeling study of irradiated bone metabolism in a mini-pig model. In this project, I performed PK modeling on FDG-PET/CT images of 15 Yucatan mini-pigs in a three-arm study. The PET/CT images were acquired at 1, 3, 6, and 12 months post spinal stereotactic radiosurgery (SRS) of the spine (C5-C7) at three different dose levels (16, 20, and 24 Gy). I showed, through two-compartment and Patlak modeling, that the FDG uptake was inversely related to the dose level at 3 months post radiosurgery. I presented the results of this study at the Society of Nuclear Medicine and Molecular Imaging (SNMMI) meeting in 2013 (oral presentation).
 - a. **S. Ramezani**, C. Makatura, X. Sun, , P. Medin, O. Öz, "Pharmacokinetic modeling of glucose uptake and retention on 18F-FDG-PET imaging of irradiated bone", *J Nucl Med.* 2013; 54 (Supplement 2):172

4. In 2014, I led another PK modeling study of a radiolabeled glucagon-like peptide (GLP-1) analog for noninvasive assessment of pancreatic beta-cell mass in a mini-pig model. Six male Ossabaw pigs (approximately 2-3 years old) were enrolled in a longitudinal study to monitor the progression of diabetes. All pigs underwent a 60-minute dynamic PET/CT scan of the abdomen on a Siemens 64-slice Biograph. I performed PK modeling using plasma input function and reversible two-compartment model to estimate the total distribution volume $V_T = (K_1/k_2) * (1 + k_3/k_4)$ in different lobes of the pancreas. I showed that V_T was significantly higher in the duodenal lobe compared to the splenic lobe ($p < 0.5$). Our results were in line with reports of the islet density in the human pancreas, where islet density was shown to be about 2-fold higher in the duodenal lobe than the splenic lobe. This work led to another oral presentation at SNMMI. The publication for this work is currently under preparation.

- a. **S. Ramezani**, W. Silvers, S. Lo, A. Kumar, L. Ildiko, J. Anderson, X. Sun, O. Öz, “Pharmacokinetics modeling of PET imaging with a GLP-1R targeted radiotracer in Ossabaw mini-pigs for noninvasive assessment of pancreatic beta-cell mass”. *J Nucl Med.* 2014; 55 (Supplement 1):389

Publications

Journals:

- T. Zhao, G. Huang, Y. Li, S. Yang, **S. Ramezani**, Z. Lin, Y. Wang, X. Ma, Z. Zeng, M. Luo, E. Boer, X. Xie, J. Thibodeaux, R. Brekken, X. Sun, B. Sumer, J. Gao, “A transistor-like pH nanoprobe for tumour detection and image-guided surgery”, *Nature Biomedical Engineering* 1, 0006, 2016
- S. Moeendarbari, R. Tekade, A. Mulgaonkar, P. Christensen, **S. Ramezani**, G. Hassan, R. Jiang, O. Öz, Y. Hao, X. Sun, “Theranostic nanoseeds for efficacious internal radiation therapy of unresectable solid tumors”, *Sci Rep.* 2016; 6: 20614
- Y. Wu, G. Hao, **S. Ramezani**, D. Saha, D. Zhao, X. Sun, AD. Sherry, “[68Ga]-HP-DO3A-nitroimidazole: a promising agent for PET detection of tumor hypoxia”, *Contrast media & molecular imaging* 10 (6), 465-472
- K. Pozo, A Hillmann, A. Augustyn, F Plattner, T. Hai, T. Singh, **S. Ramezani**, X. Sun, R. Pfragner, J. Minna, G. Cote, H. Chen, J. Bibb, F. Nwariaku, “Differential expression of cell cycle regulators in CDK5-dependent medullary thyroid carcinoma tumorigenesis”, *Oncotarget* 6 (14), 12080
- A. Kumar, G. Hao, L. Liu, **S. Ramezani**, J. Hsieh, O. K. Oz, X. Sun, “Click-chemistry Strategy for Labeling Antibodies with Copper-64 via a Cross-bridged Tetraazamacrocyclic Chelator Scaffold”, *Bioconjugate Chem.* 26 (4), 782-789
- S. Yang, S. Sun, C. Zhou, G. Hao, J. Liu, **S. Ramezani**, M. Yu, X. Sun, J. Zheng, “Renal Clearance and Degradation of Glutathione-Coated Copper Nanoparticles”, *Bioconjugate Chem.*, Feb. 25, 2015 03:06:26.
- A. Kumar, S. Zhang, G. Hao, G. Hassan, **S. Ramezani**, K. Sagiyama, S. Tang Lo, M. Takahashi, A. D. Sherry, O. K. Öz, Z. Kovacs, X. Sun, “Molecular Platform for Design and Synthesis of Targeted Dual-Modality Imaging Probes”, *Bioconjugate Chem.*, In Press January 23, 2015.
- L. Nguyen, D. Robinton, M. Seligson, L. Wu, L. Li, D. Rakheja, S. Comerford, **S. Ramezani**, X. Sun, M. Parikh, E. Yang, J Powers, G. Shinoda, S. Shah, R. Hammer, G. Daley, H. Zhu, “Lin28b is sufficient to drive liver cancer and necessary for its maintenance in murine models”, *Cancer Cell*, 2014 Aug 11; 26(2): 248-61
- A. Singh, M. Dakanali, G. Hao, **S. Ramezani**, A. Kumar, X Sun, “Enantiopure Bifunctional Chelators for Copper Radiopharmaceuticals-Does Chirality Matter in Radiotracer Design?”, *Eur. J. med. Chem.* Vol. 80, 308-315; 10 June 2014.
- R. Swiercz, S. Chiguru, A. Tahmasbi, **S. Ramezani**, G. Hao, D. Challa, M. Lewis, P. Kulkarni, X. Sun, R. Ober, R. Mason, S. Ward, “Use of Fc-engineered antibodies as clearing agents to increase contrast during PET”, *J. Nucl Med.*; Vol. 55, No. 7, 2014.
- C. Lee, S. Lo, J. Lim, D. Viviana, **S. Ramezani**, O. Öz, G Pavan, O. Annunziata, X. Sun, E. Simanek “Design, Synthesis and Biological Assessment of a Triazine Dendrimer with Approximately 16 Paclitaxel Groups and 8 PEG Groups” *Mol Pharm.* 2013 Oct 17
- **S. Ramezani**, W. Chen, and A.W.L. Chiu, “Analysis of Glutamatergic and GABAergic Receptor Dynamics in Coupled Oscillator Neural Model.”, *Journal of Modeling and Simulation* Vol. 33, No. 3, 2013

Oral Presentations:

- **S. Ramezani**, W. Silvers, S. Lo, A. Kumar, L. Ildiko, J. Anderson, X. Sun, O. Öz, “Pharmacokinetics modeling of PET imaging with a GLP-1R targeted radiotracer in Ossabaw mini-pigs for noninvasive assessment of pancreatic beta-cell mass”. J Nucl Med. 2014; 55 (Supplement 1):389
- W. Silvers, S. Lo, A. Kumar, J. Anderson, **S. Ramezani**, I. Lingvay, X. Sun, O. Oz, “Application of a Novel GLP-1 Analogue for GLP-1R Targeted Imaging in Ossabaw Mini-Pigs: Initial Results”, poster and oral presentation in the 5th NIDDK Workshop: Imaging the Pancreatic Beta Cell, Bethesda, MD. (April 2013).

Poster Presentations:

- F. Aslanea, C. Darne, **S. Ramezani**, D. Robertson, S. Beddar, "Ionization Quenching Correction of Volumetric Organic Scintillators for use in Proton Therapy" SCINT 2017 – 14th Int. Conference on Scintillating Materials and their Applications.
- P Kulkarni, N Slavine, S Chiguru, M Alhasan, **S Ramezani**, G Hao, X Sun, F Bonte “Improved quantitative accuracy of PET/CT imaging of plaque deposition in transgenic mice with F-18 quinoline for early diagnosis of AD”, Journal of Neurological Sciences, Oct 15, 2015 Vol. 357, Supplement 1, Page e65
- G. Hao, **S. Ramezani**, O. Oz, X. Sun, “Exploration of the dominant fatty acid metabolic pathway for PET imaging of prostate cancer”, J Nucl Med 56 (supplement 3), 1122-1122
- H. Cai, **S. Ramezani**, P. Christensen, G. Hao, X. Sun, “Copper-64 Labelled Fingolimod for PET Imaging of the Sphingolipid-1-Phosphate Axis in Prostate Cancer”, J Nucl Med 56 (supplement 3), 1123-1123
- W. Silvers, H. Cai, **S Ramezani**, O. Oz, X. Sun, “Design and synthesis of a Radiotracer for Noninvasive Imaging of Stearoyl-CoA Desaturase-1” J Nucl Med 56 (supplement 3), 1043-1043
- **S. Ramezani**, J Guo, X. Sun, O. Öz, “Estrogen Receptor Alpha Regulates Temperature Induced Changes in Brown Fat FDG Avidity”, Accepted for Poster Presentation in WMIC, September 17, 2014.
- R. Tekade, L. Xu, G. Hao, **S. Ramezani**, W. Silvers, P. Christensen, X, Sun, “A facile preparation of radioactive gold nanoplateforms for potential theranostic agents of cancer”, J Nucl Med. 2014; 55 (Supplement 1):1047
- M. Dakanali, S. Lo, G. Hassan, **S. Ramezani**, O. Öz, X, Sun, “Detection of liver fibrosis based on an $\alpha v\beta 6$ -integrin targeted PET probe”, J Nucl Med. 2014; 55 (Supplement 1):1241
- W. Silvers, **S. Ramezani**, S. Lo, A. Kumar, J. Ahn, B. Manandhar, I. Lingvay, J. Anderson, X. Sun, O. Öz, “Glucagon-like peptide 1 receptor (GLP-1R) targeted PET imaging of beta-cell mass (BCM) in Ossabaw mini-pigs” Poster presentation at ACS National Meeting, March, 2014.
- **S. Ramezani**, I. Cuberovic, C. Makatura, P. Medin, J. Anderson, X. Sun, O. Öz, “Quantification of changes in bone metabolism caused by spinal radiosurgery in a mini-pig model”, Oklahoma Skeletal Biology Symposium (Nov 2013).
- W. Silvers, **S Ramezani**, S. Lo, A. Kumar, J. Ahn, B. Manandhar, I. Lingvay, J. Anderson, X. Sun, O. Öz. , “A pilot study on glucagon-like peptide 1 receptor (GLP-1R) targeted PET imaging of beta-cell mass(BCM) in Ossabaw mini-pigs”, World Molecular Imaging Congress. (September 2013).
- S. Chiguru, R. Reddy, R. Hallac, J. Gunpat, H. Zhou, **S. Ramezani**, N. Slavine, P. Kulkarni, M. Lewis, R. Mason, , “Examining tumor hypoxia using MRI (BOLD/TOLD) in correlation with [¹⁸F]FMISO PET”, J. Nucl Med. 2013; 54 (Supplement 2): 1138

- **S. Ramezani**, C. Makatura, X. Sun, , P. Medin, O. Öz, “Pharmacokinetic modeling of glucose uptake and retention on 18F-FDG-PET imaging of irradiated bone”, J Nucl Med. 2013; 54 (Supplement 2):172
- C. Makatura, **S. Ramezani**, O. Öz, “Pharmacokinetic Modeling of Glucose Uptake and Retention on FDG-PET Imaging of Irradiated Bone” QP-SURF, UT Southwestern Medical Center, (August 2012).
- **S. Ramezani** and A.W.L. Chiu, “Glutamate receptor dynamics in coupled oscillator model: A preliminary analysis of network complexity”, Abstract Supplement for the BMES Annual Fall Meeting, Hartford, CT. (October 2011).
- **S. Ramezani**, Wu Chen, Alan Chiu, “Multi-scale oscillator based modeling: From single cell to hippocampal slice activities”. Louisiana Biomedical Research Network 9th Annual Meeting, Shreveport, LA. (January 2011).