

SILVIYA PETROVA ZUSTIAK

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EDUCATION

- 2004 - 2009 **Ph.D.**, Department of Chemical and Biochemical Engineering, University of Maryland
Baltimore County (UMBC), Baltimore, MD
- 1997 - 2002 **BS/MS**, Department of Electrical Engineering, Technical University, Sofia, Bulgaria

POSITIONS AND AFFILIATIONS

- 2021 Present **Scientific Advisory Board Member**, Buswell Biomedical LLC, St Louis, MO
- 2020 Present **Associate Professor** Secondary Appointment, Department of Pharmacology and Physiology,
St. Louis University Medical School, St Louis, MO
- Jan Aug 2020 **Visiting Professor**, Center for Engineering MechanoBiology (CEMB), Washington
University, St. Louis, MO
- 2019 Present **Member**, Institute of Clinical and Translational Sciences, Washington University, St. Louis,
MO
- 2019 Present **Executive Leadership Committee Member**, Center for Neuroscience, Saint Louis
University, St. Louis, MO
- 2018 Present **Member**, Siteman Cancer Center, Washington University, St. Louis, MO
- 2018 Present **Co-director**, Institute for Drug and Biotherapeutic Innovation (IDBI), SLU
- 2018 Present **Associate Professor**, Biomedical Engineering, St. Louis University, St. Louis, MO
- 2017 Present **Member**, Musculoskeletal Research Center, Washington University, St Louis, MO
- 2017 2020 **Ad-hoc Graduate Faculty**, Department of Chemical Engineering, Michigan Technological
University, Houghton, MI
- 2014 2019 **Adjunct Assistant Professor**, Department of Chemical and Biological Engineering, Missouri
University of Science and Technology - Rolla, MO
- 2013 2018 **Assistant Professor**, Department of Biomedical Engineering, St. Louis University, St. Louis,
MO
- 2010 2012 **Postdoctoral Fellow**, Laboratory of Integrative and Medical Biophysics, NICHD/NIH,
Bethesda, MD
- 2005 2010 **Research Assistant**, Department of Chemical & Biochemical Engineering, UMBC,
Baltimore, MD
- 2001 2002 **Research Assistant**, Department of Electrical Engineering, Technical University, Sofia,
Bulgaria

PROFESSIONAL ORGANIZATIONS

- | | |
|--|------------------|
| Sigma Xi, The Scientific Research Honor Society | 2019-present |
| American Institute of Chemical Engineers (AIChE) | 2007-2018 |
| Biomedical Engineering Society (BMES) | 2014-present |
| Biophysical Society (BPS) | 2011-2015 |
| Society for Biomaterials (SfB) | 2009, 2014, 2019 |
| Materials Research Society (MRS) | 2008 |

HONORS AND AWARDS

- 2019 **Keynote speaker**, Directed and enhanced neurite outgrowth following exogenous electrical stimulation on carbon nanotube-hydrogel composites Annual Technical Meeting of the Society of Engineering Science, St Louis, MO
- 2018 **Department of Athletics Straight A Luncheon Faculty Honoree**, invited by student athlete Allyson Stanley
- 2018 **Saint Louis University Scholarly Works Award** for a junior faculty member (1 awarded per year)
- 2017 Nomination: **Outstanding Faculty**, Association of Parks College Students, SLU, St Louis, MO
- 2016 Nomination: **Outstanding Faculty**, Association of Parks College Students, SLU, St Louis, MO
- 2015 Manuscript published in JOMJ
- 2015 **Most Impactful Person (MIP)** certification of recognition by a graduating senior, SLU, St Louis, MO
- 2015 Nomination: **Outstanding Faculty**, Association of Parks College Students, SLU, St Louis, MO
- 2015 **Outstanding Parks Graduate Faculty Award**, SLU, St Louis, MO
- 2014 **Department of Athletics Straight A Luncheon Faculty Honoree**, invited by student athlete Colleen Cole
- 2014-15 **KEEN Faculty**, KEEN Kern Entrepreneurial Education Network
- 2013 **Feature Article**: manuscript in Tissue Engineering, Part B
- 2014 **Top-Read Article**: manuscript in Tissue Engineering, Part B
- 2013 **Best Poster Award**, Functional Analysis and Screening Technologies (FAST) Conference: Engineering Functional 3D Tissue Models, Boston, MA
- 2011 **Travel Grant**: AIChE
- 2011 **Fellows Award for Research Excellence (FARE)**, NIH
- 2011 Abstract selected for an **oral presentation** at the NICHD Annual Retreat (6 out of 75 fellows)
- 2009 Abstract selected for **Mini-talk Oral Presentation** session at the Gordon Research Conference: Biomaterials: Biocompatibility/Tissue Engineering
- 2007 **First prize poster award** by mentee Robert Reeves at the Undergraduate Research Consortium in the Chemical and Biological Sciences, UMBC
- 1998-01 **Stipend for academic excellence** from Technical University, Sofia, Bulgaria

HONORS AND AWARDS TO RESEARCH MENTEES

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- 2017 **Outstanding Innovative Research Award** to undergraduate researcher Alexandra Blanco, STLAURS, St Louis, MO (a single award for the whole symposium)
- 2017 **Best Poster Award, Second Place** to undergraduate researcher Dzhuliya Vasileva, Biomedical Engineering category, STLAURS, St Louis, MO
- 2017 **Dissertation Fellowship** to PhD student Mozhdeh Imaninezhad by Saint Louis University
- 2016 to STARS student Rohit Lalit Chouhan
- 2016 **Parks College Graduate Scholarship Award** to PhD student Saahil Sheth
- 2016 **Parks College Graduate Scholarship Award** to PhD student Mozhdeh Imaninezhad
- 2016 **Grand Challenge Scholar** award to undergraduate researcher Erin Canning
- 2016 **Oliver L. Parks Award** to undergraduate lab alumna Colleen Cole
- 2016 **Honorable Mention, Barry Goldwater Scholarship** to undergraduate researcher Dzhuliya Vasileva
- 2015 **Outstanding BME Senior Award** to undergraduate researcher Kristin Kalinowski
- 2015 **Saint Louis University Leadership Honoraria**
- 2015 **Nora Manahan Scholarship** to undergraduate researcher Anirudh Guduru
- 2015 **BMES Annual Conference Travel Award** to PhD student Mozhdeh Imaninezhad
- 2015 Membership for **Alpha Sigma Nu, the Jesuit Honor Society** for PhD student Lindsay Hill
- 2015 **Barta Graduate Scholarship** to PhD student Mozhdeh Imaninezhad by Parks College, SLU, St Louis, MO
- 2015 **Best Poster Award, Second Place** to

Conference proceedings

1. #E. Jain, #S. Sheth, S. Patel, M. Flanagan, Q. Gan, S. A. Sell, A. M. Montano, ***S. P. Zustiak**

Molecular Genetics and Metabolism, 2017, 120(1-2), S70; (IF: 3.769)

5. **SP Zustiak**, Hydrogels for drug screening and protein delivery applications Seminar, Michael

25. **SP Zustiak**, as a Tunable Scaffold
Program in Physical Biology Seminar Series, NIH, Bethesda, MD,
December 2010
26. **S Petrova**,
2005 National Society of Black Engineers Meeting, UMBC, December

Annual guest lecture: SP Zustiak

Guest Lecture, BME 1000: Introduction to Biomedical Engineering class, Department of

10. #L Aryan, K Vogt, *A Hall, ***SP Zustiak** Resorbable Radiopaque Microspheres for Catheter Embolization using Microfluidics (Oral), Institute for Biological Engineering (IBE), Annual Meeting, St Louis, MO, April 2019
11. #S Stealey, C Wall, S Sheth, N Pozzi, ***SP Zustiak**, *N Case Exploration of extracellular macromolecular crowding effects on protein diffusion and interactions via Fluorescence Correlation Spectroscopy (Oral), Institute for Biological Engineering (IBE), Annual Meeting, St Louis, MO, April 2019
12. #K Vogt, M Imaninezhad, D Vasileva, M McQuilling, ***SP Zustiak** A Simple Microfluidic Device for the Production of Monodisperse Hydrogel Microspheres (Oral), Institute for Biological Engineering (IBE), Annual Meeting, St Louis, MO, April 2019
13. #M Choi, A Blanco, X Duan, N Case, S Sell, M Farooq Rai, ***SP Zustiak** Fabrication and characterizations of hydrogel microspheres for sustained delivery of platelet-rich plasma for the treatment of osteoarthritis (Oral), Institute for Biological Engineering (IBE), Annual Meeting, St Louis, MO, April 2019
14. M Imaninezhad, L Hill, #J Conley, J Ortlund, ***SP Zustiak** Templated Macroporous Polyethylene Glycol Hydrogels for Spheroid and Aggregate Cell Culture (Oral), Institute for Biological Engineering (IBE), Annual Meeting, St Louis, MO, April 2019
15. #N Schaper, B Hutchinson, ***SP Zustiak**, *

25. #M Imaninezhad, I Kuljanishvili, ***SP Zustiak**, "A Two-Step Method for Transferring Single Wall Carbon Nanotubes Onto a Hydrogel Substrate", (Oral), American Institute of Chemical Engineers (AIChE) Annual Meeting, Minneapolis, MN, October 2017

12. #S Stealey, ***SP Zustiak** Sustained Protein Release from Laponite Nanocomposite Hydrogels Henry and Amelia Nasrallah Center for Neuroscience Research Symposium, St Louis, MO, November 1, 2019
13. #

28. #A Blanco, #E Jain, N Chinzei, N Case, SA Sell, MF Rai, ***SP Zustiak** Sustained-released platelet-rich plasma from polyethylene glycol hydrogels exerts beneficial effects on chondrocytes Society for Biomaterials (SfB) Annual Meeting, Seattle, WA, April 2019
29. #S Syed, #A Blanco, #E Jain, N Chinzei, N Case, SA Sell, MF Rai, ***SP Zustiak** Design of Polyethylene Glycol Hydrogels Society for Biomaterials (SfB) Annual Meeting, Seattle, WA, April 2019
Selected for a Rapid Fire Oral Presentation
30. #S Sheth, E Barnard, M Rathinam, ***SP Zustiak** Fluorescence Correlation Spectroscopy for the Measurement and Prediction of Drug Release from Degradable Hydrogels Society for Biomaterials (SfB) Annual Meeting, Seattle, WA, April 2019
31. #S Syed, #A Blanco, J Schober, ***SP Zustiak** Morphological Adaptations in Breast Cancer Cells as a

43. #H Choi, #A Blanco, #K Vogt, ***SP Zustiak** Microgel fabrication device for delivery of platelet-rich-plasma to treat knee post-traumatic osteoarthritis (Poster), Graduate Student Association Research Symposium, St Louis, MO, April 27, 2018
44. #M Imaninezhad, K Kalinowski, R Bera, ***SP Zustiak** A custom device for electrical stimulation of hydrogel-

76. #S Sheth, E Jain, K Polito, SA Sell, ***SP Zustiak** Biomedical Engineering
Society (BMES) Annual Meeting, Minneapolis, MN, October 2016
77. #L Hill, A Ashraf, ***SP Zustiak** gel-
Biomedical Engineering Society (BMES) Annual Meeting, Minneapolis, MN, October 2016
78. #***SP Zustiak** -vitro hydrogel-based multicellular cancer sphe
GRC: Signal Transduction by Engineered Extracellular Matrices, Biddeford, ME, June 2016
79. #P Donovan, Y Chehrehghanianzabi, *M Rathinam, ***SP Zustiak**
of obstructed diffusivity in macromolecular SIAM Conference on Mathematical
Aspects of Materials Science, Philadelphia, PA, May 2016
80. #E Jain, Y Chehrehghanianzabi, M Flanagan, S Sell, A Montano, ***SP Zustiak**
Pediatric Science Day, SLU, St. Louis, MO,
April 2016
81. #Y Wang, D Vasileva, ***SP Zustiak**, *
nanotubes- St. Louis Area Undergraduate
Research Symposium, St Louis, MO, April, 2016
82. #D Vasileva, K Shah, ***SP Zustiak** -carbon

93. #E Jain, Y Chehrehghanzabi, M Flanagan, S Sell, A Montano, ***SP Zustiak**
enzyme repl Poster), Midwest Regenerative Medicine
Meeting, Monticello, IL, April 2016
Selected for an oral presentation
94. #F Ordikhani, A Simchi, ***SP Zustiak**

Institute of Nanoscience and Nanomedicine (SLINN)

St. Louis

125. #J Redington, E Jain, S Sell, *SP Zustiak

ing degradation of

8. #

24. #S Petrova, JB Leach,

14. Treatment of osteoarthritis via sustained delivery of PRP using microgel device Clinical and Translational Research Funding Program, Barnes-Jewish Hospital Foundation & WU Institute of Clinical and Translational Sciences, Dates: 07/01/2017 06/30/2018; **Role co-PI** (PI: Muhammad Farooq Rai)
15. -L (PEG) microspheres: towards synovial fluid
Biopsy Sciences, Clearwater, FL, Research Contract, Dates: 07/01/2017
01/01/2018: **Role - PI**
16. -

15.

1. Shibapriya (Tista) Mandal,

Fall 2015-Spr 2017 **Member:** Parks Institutional Affairs Committee
 Spring 2015 **Member:** Parks College Graduate Student Award Committee
 Spring 2015 **Member:** Barta Graduate Scholarship Committee, SLU, St. Louis, MO
 Spring 2015 **Participant:** Admitted Student Day
 Spring 2015 **Judge:** Weekly Innovation Challenge (WIC), Parks, SLU, St Louis, MO
 Spring 2014 **Member:** Parks College Graduate Faculty and Student Award Committee
 Fall 2013-Sum 2016 **Marshal:** Student Marshal for Parks College
 Fall 2013-Spr 2015 **Member:** Parks Graduate the Research Affairs Committee
 Spring 2013 **Member:** Clare Boothe Luce Graduate Fellowship Award Committee
 Spring 2013 **Member:** Oliver Parks Award Committee
 Fall 2013,14,15 **Participant:** Opened lab for Select Saturday recruiting event
 Spr 2013-Fall 2015 **Advisor:** Society for Women Engineers (SWE) SLU chapter

Departmental Service

2020 **Coordinated a Program Level Review** for promotion and tenure for Koyal Garg
 2019 **Coordinated a Program Level Review** for promotion and tenure for Andrew Hall and Yan Gai
 Summer 2018-present **Graduate Program Coordinator:** BME Graduate Program
 Fall 2016-present **Faculty coordinator:** organized travel for BME students to BMES Annual Meeting, Minneapolis, MN
 Summer 2016 **Chair:** BME Instructor Search Committee
 Summer 2016-present **Initiator and Coordinator:** BME Summer Seminar Series
 Spring 2013-present **Student recruitment support:** one-on-one meetings with prospective and admitted students and families (~5-10 meetings per year)
 Spring 2016 **Participant:** Freshmen lab tours
 Spring 2015 **Judge:** Start-up Presentations for Entrepreneurship Class, Instructor: Dr. Andrew Hall
 Spring 2015, 16 **Judge:** BME Senior Design Poster Presentations
 Fall 2014-2018 **Member:** BME Graduate Admissions Committee
 Fall 2014 **Organizer:** 1st Annual BME Graduate Students Welcome event
 Fall 2013-present **Faculty Mentor:** Undergraduate Student Faculty Mentor
 Fall 2013-Spr 2014 **Member:** BME Faculty Search Committee
 Fall 2013-Spr 2014 **Member:** BME Chair Search Committee

Parks/BME Seminar series: speaker invitations and arrangements

Fall 2020 Dr. Danielle Benoit, Biomedical Engineering, University of Rochester, Rochester, NY
 Dr. Mikail Berezin, Medical School, Washington University in St Louis, St Louis, MO
 Spring 2020 Dr. Shreyas Rao, Chemical&Biological Engineering, University of Alabama, Tuscaloosa, AL
 Dr. Aaron Timperman, Bioengineering, University of Illinois Urbana-Champaign, IL
 Dr. Mikhail Berezin, Radiology, Washington Unviersity in St Louis, St Louis, MO
 Fall 2019

Spring 2018 Dr. Kyle Lampe, Chemical Engineering, University of Virginia, Charlottesville, VA
 Dr. Tamara Kinzer-Ursem, Biomedical Engineering, Purdue University, West Lafayette, IN
 Dr. Princess Imoukhuede, Bioengineering, University of Illinois, Urbana-Champaign, IL

Fall 2017 Dr. Giovanna Guidoboni, Electrical Engineering and Computer Science, University of Missouri, Columbia, MO
 Dr. Lori Setton, Biomedical Engineering, Washington University, St Louis, MO

Spring 2017 Dr. Caryn Heldt, Chemical Engineering, Michigan Technological University, Houghton, MI

Fall 2016 Dr. Fateme Rezaei, Chemical and Biological Engineering, MST, Rolla, MO
 Dr. Feglian Xu, Biology, Saint Louis University, St Louis, MO

Sum 2016 Dr. Sara McBride-Gagy, Orthopedic Surgery, SLU, MO
 Dr. Anna Allen, Biology, Howard University, Washington, DC
 Dr. Sahin Kaya Ozdemir, Electrical Engineering, WashU, St Louis, MO

Fall 2015 Dr. Yonghyun Kim, Chemical and Biological Engineering, UA, Tuscaloosa, AL
 Dr. Sutapa Barua, Chemical and Biological Engineering, MST, Rolla, MO

Spring 2015 Dr. Candan Tamerler, Mechanical Engineering, The University of Kansas, Lawrence, KS

Fall 2014

PROFESSIONAL SERVICE

Reviewer for Funding Agencies

- 2021 Grant Review Panel: Combat Readiness-Medical Research Program (CRRP), **DoD** Feb 3-4
- 2020 Grant Review Panel: Support for Competitive Research (SCORE) review panel, **NIGMS/NIH**
July 18
- 2020 Grant Review Panel: Bioengineering, Surgery, Anesthesiology, and Trauma , **NIH** March 18
- 2019 Ad-hoc Grant Reviewer for the National Science Centre (**NSC**), Poland, SONATA BIS competition ~~December 22~~
- 2019 Grant Review Panel: Support for Competitive Research (SCORE) review panel, **NIGMS/NIH**
October 11
- 2019 Ad-hoc Grant Reviewer for the Medical Research Council, United Kingdom June 25
- 2019 Grant Review Panel: Support for Competitive Research (SCORE) review panel, **NIGMS/NIH**
June 28
- 2018 Ad-hoc Grant Reviewer for Biosciences for the Future, Wiltshire, United Kingdom
December 3
- 2018 Ad-hoc Grant Reviewer for the Beaumont Faculty Development Fund, internal **SLU** grant
August
- 2017 Ad-hoc Grant Reviewer for the Nexus of Animal and Human Health Research Review, Kansas City Area Life Sciences Institute (**KCALSI**), October 16
- 2015 Grant Review Panel: Unsolicited Biotechnology & Biochemical Engineering Panel **NSF**, CBET Division December 10-11
- 2015 Grant Review Panel: Support for Competitive Research (SCORE) review panel, **NIGMS/NIH**
June 26
- 2014 Grant Review Panel: Support for Competitive Research (SCORE) review panel, **NIGMS/NIH**
June 26
- 2014 Grant Review Panel: Support for Competitive Research (SCORE) review panel, **NIGMS/NIH**
February 26
- 2013, 14, 18 Ad-hoc Grant Reviewer for **SLU** grant
- 2011 Grant Review Panel: Stem Cell, Tissue Engineering and D National Science Foundation (**NSF**), CBET Division - ~~December~~

Journal Editorial/Review Boards ~~2011-2012~~ ~~01 0 92 .02 0 92 reW* nBT/F2 1 Tf10 25.4Tm04Tm25.4Tm0G(2011-2012)~~

2018 Colloids and Surfaces B: Interfaces (*IF: 3.994*)
2018 Frontiers in Bioengineering and Biotechnology (*IF: 5.122*)
2018 Frontiers in Oncology (*IF: 4.416*)
2018 Computational and Structural Biotechnology (*IF: 4.148*)
2018 Journal of Microencapsulation (*IF: 1.585*)
2018 Cells Tissues Organs (*IF: 1.275*)
2018 Journal of the Mechanical Behavior of Biomedical Materials (*IF: 2.57*)
2018 Journal of Polymer Science, Part B (*IF: 3.830*)
2018 Biochemistry & Analytical Biochemistry (*IF: 2.63*)
2018 Advanced Materials (*IF: 19.791*)
2018 Small (*IF: 8.315*)
2017 Cancer Letters (*IF: 6.375*)
2017 Frontiers in Materials (*IF: 2.008*)
2017 Biotechnology and Bioengineering (*IF: 4.481*)
2017 Journal of the Mechanical Behavior of Biomedical Materials (*IF: 3.110*)
2017 Advanced Engineering Materials (*IF: 1.758*)
2017 Biotechnology Progress (*IF: 2.167*)
2017 Chemical Engineering Journal (*IF: 5.439*)
2017 ACS Biomaterials Science & Engineering (*IF: 4.432*)
2017 European Polymer Journal (*IF: 3.242*)
2016 Biomaterials (*IF: 8.557*)
2016 International Journal of Oncology (*IF: 3.025*)
2016 Current Nanoscience (*IF: 0.934*)
2016 Biomacromolecules (*IF: 5.750*)
2016 Macromolecular Chemistry and Physics (*IF: 2.451*)
2016 AIChE Journal (*IF: 2.748*)
2016 Tissue Engineering Part B: Reviews (*IF: 4.64*)
2015 Macromolecular Rapid Communications (*IF: 4.608*)
2015 Sensors (*IF: 2.245*)
2015 Materials Today (*IF: 10.85*)
2015 ACS Chemical Neuroscience (*IF: 4.362*)
2015 Tissue Engineering - Part C: Methods (*IF: 4.64*)
2015 Biomaterials Science (*IF: 3.831*)
2015 Cellular and Molecular Bioengineering (*IF: 1.318*)
2015 Annals of Biomedical Engineering (*IF: 3.195*)
2015 Journal of the Minerals, Metals, and Materials Society (*IF: 1.757*)
2014 Advanced Functional Materials (*IF: 13.5*)
2014 Advanced Healthcare Materials (*IF: 5.79*)
2014 Journal of Materials Chemistry B (*IF: 4.726*)
2014 Micromachines (*IF: 1.286*)
2013 Macromolecular Bioscience (*IF: 3.650*)
2013 Journal of Biomaterials Science: Polymer Edition (*IF: 1.648*)
2013 Acta Biomaterialia (*IF: 6.025*)
2013 Journal of Visualized Experiments (JoVE) (*IF: 1.325*)
2012 Soft Matter (*IF: 4.151*)
2012 Journal of Biomedical Materials Research: Part A (*IF: 3.369*)
2011 Journal of Controlled Release (*IF: 7.633*)
2011 International Journal of Molecular Sciences (*IF: 2.339*)

2011 Macromolecular Theory and Simulations (*IF*: 1.793)

Sigma Xi Honor Society

2020 President-Elect for Sigma Xi SLU Chapter

Biomedical Engineering Society (BMES)

Abstract/Extended Abstract Reviewer

2019

