Sebastián L. Vega

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Education

Rutgers University
Doctor of Philosophy in **Chemical and Biochemical Engineering** (2014)

Carnegie Mellon University
Bachelor of Science in **Chemical Engineering** (2006)

Carnegie Mellon University
Bachelor of Science in **Biomedical Engineering** (2006)

Research Appointments

Cooper Medical School of Rowan University
Assistant Professor (2022 – Present)
Department of Orthopaedic Surgery

Rowan University
Assistant Professor (2018 – Present)
Department of Biomedical Engineering

University of Pennsylvania
Postdoctoral Researcher (2015 – 2018)
Department of Bioengineering
Advisor: Jason A. Burdick

University of Twente
Visiting Scholar (2014)
Department of Tissue Regeneration
Advisor: Jan de Boer

Rutgers University
Graduate Research Assistant (2008 – 2014)
Department of Chemical and Biochemical Engineering
Advisors: Prabhas V. Moghe and Joachim Kohn

Industry Experience

Samsung Austin Semiconductor
Process Engineer (2006 – 2008)

L'Oreal USA
Research and Development Intern (2005)

Westinghouse Electric Corporation
Risk Assessment Intern (2004)

Awards

- CMBE Young Innovator (2022)
- ORS NIRA (New Investigator Recognition Award) Finalist (2022)
- Frances R. Lax Fund for Faculty Development (2019)
- SFB STAR (Student Travel Achievement Recognition) Award (2017)
- Compact for Faculty Diversity Travel Award (2016)
- NSF STEM Cell IGERT International Travel Award (2014)
- NSF Mini-Grant on Innovation through Institutional Integration (2013)
- NSF Diversity Service and Excellence Award Fellowship (2012)

Publications

In Preparation

6. KA Gultian, U Jalloh, A Madden, A Gsell, J MacAulay, J Smith, **SL Vega**. Synthesis and photopatterning of synthetic thiol-norbornene hydrogels. *RSC Advances*, **In Preparation**.
5. MM Benmassaoud, N Belanger, A Stevens, S Dalwadi, M Tang, M Deleg, V Beachley, **SL Vega**. Facile method for covalently binding peptides onto polycaprolactone films and nanofibers. *Materials Letters*, **In Preparation**.
4. KA Gultian, SA Love, **SL Vega**. Recent advances in injectable Diels-Alder hydrogels for biomedical applications. *Biomaterials Science*, **In Preparation**.
3. MM Benmassaoud, A Copling, R Kumaresan, D Cortes, M Curry, G Fleischer, VJ Carabetta, **SL Vega**. Antimicrobial peptide hydrogels that prevent the formation of biofilms. *ACS Biomaterials Science & Engineering*, **In Preparation**.
2. KA Gultian, U Jalloh, A Stevens, TWB Kim, **SL Vega**. BMP-2 functionalized injectable hydrogels with human mesenchymal stem cells enhance femoral trabecular bone growth. *Journal of Orthopaedic Research*, **In Preparation**.
1. D Cortes, G Fleisher, A Copling, R Kumaresan, SL Vega, VJ Carabetta. Recent advances in antimicrobial peptide hydrogels. *International Journal of Molecular Sciences*, **In Preparation**.

In Progress

2. KA Gultian, GS Ibbott, LH Kim, **SL Vega**. An injectable dosimeter for real-time, in vivo verification of MR-guided radiation therapy: proof of concept. *Medical Physics*, **Under Review**.
1. L Paone, MM Benmassaoud, A Curran, **SL Vega**, PA Galie. Spatial patterning of peptide motifs tunes cell-matrix interactions within perfusable, vascularized networks. *Biomaterials*, **Under Review**.

Published

25. KA Gultian, R Gandhi, TWB Kim, **SL Vega**. Self-forming norbornene-tetrazine hydrogels with independently tunable properties. *Macromolecular Bioscience*, **2022**.
24. K Driscoll, MS Butani, KA Gultian, A McSweeny, JM Patel, **SL Vega**. Plant tissue parenchyma and vascular bundles selectively regulate stem cell mechanosensing and differentiation. *Cellular and Molecular Bioengineering 2022 Young Innovators Special Issue*, **2022**.
23. KA Gultian, R Gandhi, K DeCesari, V Romiyo, EP Kleinbart, K Martin, PM Gentile, TWB Kim, **SL Vega**. Injectable hydrogel with immobilized BMP-2 mimetic peptide for local bone regeneration. *Frontiers in Biomaterials Science*, **2022**.
22. KA Gultian, R Gandhi, K Sarin, M Sladkova-Faure, M Zimmer, GM de Peppo, **SL Vega**. Human induced mesenchymal stem cells display increased sensitivity to matrix stiffness. *Scientific Reports* **2022**. 12(1), 1-9.
21. DE Mason, M Goeckel, **SL Vega**, PH Wu, D Johnson, SJ Heo, D Wirtz, JA Burdick, L Wood, BY Chow, AN Stratman, JD Boerckel. Mechanotransductive feedback control of endothelial cell motility and vascular morphogenesis. *BioRxiv*, **2022**.
20. M DiCerbo, MM Benmassaoud, **SL Vega**. Porous scaffold-hydrogel composites spatially regulate 3D cellular mechanosensing. *Frontiers in Medical Technology* **2022**. 4, 884314.
19. AP Liu, EA Appel, PD Ashby, BM Baker, E Franco, L Gu, K Haynes, NS Joshi, AM Kloxin, PHJ Kouwer, J Mittal, L Morsut, V Noireaux, S Parekh, R Shulman, SKY Tang, MT Valentine, **SL Vega**, W Weber, N Stephanopoulos, O Chaudhuri. The 'living interface': a bridge between synthetic biology and biomaterials. *Nature Materials* **2022**. 21(4), 390.
18. S Trujillo, **SL Vega**, KH Song, AS Félix, MJ Dalby, JA Burdick, M Salmeron-Sanchez. Engineered full-length fibronectin-hyaluronic acid hydrogels for stem cell engineering. *Advanced Healthcare Materials* **2020**. 9(21), 2000989.

17. MM Benmassaoud, KA Gultian, M DiCerbo, **SL Vega**. Hydrogel screening approaches for bone and cartilage tissue regeneration. *Annals of the New York Academy of Sciences* **2020**. 1460(1), 25.

16. **SL Vega**, V Arvind, P Mishra, J Kohn, NS Murthy, PV Moghe. Substrate micropatterns produced by polymer demixing regulate focal adhesions, actin anisotropy, and lineage differentiation of stem cells. *Acta Biomaterialia* **2018**. 76, 21.

15. MY Kwon, **SL Vega**, WM Gramlich, M Kim, RL Mauck, JA Burdick. Dose and timing of N-cadherin mimetic peptides regulate MSC chondrogenesis within hydrogels. *Advanced Healthcare Materials* **2018**. 7(9), 170199.

14. **SL Vega**, MY Kwon, KH Song, C Wang, L Han, RL Mauck, JA Burdick. Combinatorial hydrogels with biochemical gradients for screening 3D cellular microenvironments. *Nature Communications* **2018**. 9(1), 614.

13. YC Yeh, EA Corbin, SR Caliari, L Ouyang, **SL Vega**, R Truitt, L Han, KB Margulies, JA Burdick. Mechanically dynamic PDMS substrates to investigate changing cell environments. *Biomaterials* **2017**. 145, 23.

12. AM Rosales, **SL Vega**, FW DelRio, JA Burdick, KS Anseth. Hydrogels with reversible mechanics to probe dynamic cell microenvironments. *Angewandte Chemie* **2017**. 56(40), 12132.

11. **SL Vega**, E Liu, V Arvind, J Bushman, HJ Sung, ML Becker, S Lelièvre, J Kohn, PA Vidi, PV Moghe. High-content image informatics of the structural protein NuMA parses trajectories for stem/progenitor cell lineages and oncogenic transformation. *Experimental Cell Research* **2017**. 351(1), 11.

10. **SL Vega**, MY Kwon, JA Burdick. Recent advances in hydrogels for cartilage tissue engineering. *European Cells and Materials* **2017**. 33, 59.

9. E Liu, **SL Vega**, A Dhaliwal, MD Treiser, HJ Sung, PV Moghe. High-resolution fluorescence imaging of cell-biomaterial interactions. In *Comprehensive Biomaterials II*, Elsevier, **2017**.

8. SR Caliari*, **SL Vega***, MY Kwon, EM Soulas, JA Burdick. Dimensionality and spreading influence MSC YAP/TAZ signaling in hydrogel environments. *Biomaterials* **2016**. 103, 314.

7. **SL Vega**, MY Kwon, RL Mauck, JA Burdick. Single cell imaging to probe mesenchymal stem cell N-cadherin mediated signaling within hydrogels. *Annals of Biomedical Engineering* **2016**. 44(6), 1921.

6. **SL Vega***, A Dhaliwal*, V Arvind, PJ Patel, NRM Beijer, J de Boer, NS Murthy, J Kohn, PV Moghe. Organizational metrics of interchromatin speckle factor domains: integrative classifier for stem cell adhesion & lineage signaling. *Integrative Biology* **2015**. 7(4), 435.

5. SD Sommerfeld, Z Zhang, M Costache, **SL Vega**, J Kohn. Enzymatic surface erosion of high tensile strength polycarbonates based on natural phenols. *Biomacromolecules* **2014**. 15(3), 830.

4. YJ Lee, **SL Vega**, PJ Patel, KA Aamer, PV Moghe, MT Cicerone. Quantitative, label-free characterization of stem cell differentiation at the single-cell level by broadband coherent anti-Stokes Raman scattering microscopy. *Tissue Engineering Part C: Methods* **2013**. 20(7), 562.

3. JJ Kim, **SL Vega**, PV Moghe. A high content imaging-based approach for classifying cellular phenotypes. *Methods in Molecular Biology* **2013**. 1052, 41.

2. **SL Vega***, E Liu*, PJ Patel, AB Kulesa, AL Carlson, Y Ma, ML Becker, PV Moghe. High-content imaging-based screening of microenvironment-induced changes to stem cells. *Journal of Biomolecular Screening* **2012**, 17(9), 1151.
   ****Selected as Feature Cover.**

1. E Liu, **SL Vega**, MD Treiser, HJ Sung, PV Moghe. Fluorescence imaging of cell-biomaterial interactions. In *Comprehensive Biomaterials*, Elsevier, **2011**.

* Authors contributed equally

Patents

3. **SL Vega**, KA Gultian, TWB Kim. Hydrogels and methods of using the same. *US Provisional Patent Application No. 63/391,422*. July 2022.

2. **SL Vega**, KA Gultian, L Kim, I Malajovich, G Ibbott. Injectable dosimeter compositions and methods of using same. *U.S. Provisional Patent Application No. 63/348,920*. June 2022.

1. V Beachley, **SL Vega**, D Jao. Synthetic aligned tissue grafts and methods of using same. *International Patent Application PCT/US2022/031429*. May 2022.

Presentations

69. A Pucha*, GE McColgan, **SL Vega**, JM Patel. Micro-scale cellular and mechano-response in composite scaffolds for meniscus replacement. *Orthopaedic Research Society (ORS) Annual Meeting*, Feb. 2023, Dallas, TX.

68. KA Gultian, GS Ibbott, LH Kim*, **SL Vega**. An injectable dosimeter for real-time, in vivo verification of MR-guided radiation therapy: proof of concept. *The 9th MR in RT Symposium*, Feb. 2023, Los Angeles, CA.

67. **SL Vega***. Plant tissue parenchyma and vascular bundles selectively regulate stem cell mechanosensing and differentiation. *Biomedical Engineering Society (BMES) Annual Meeting*, Oct. 2022, San Antonio, TX. *CMBE Young Innovator Award Recipient*.

66. **SL Vega***. Injectable hydrogels for biomedical applications. *George Mason University Biomedical Engineering Seminar*, Sept. 2022, Fairfax, VA.

65. B Herb*, S Dalwadi, N Belanger, V Beachley, **SL Vega**. Hydrogel thickness and nanofiber connectivity influence cell alignment and morphology in hydrogel-nanofiber composites. *Society for Biomaterials (SFB) Annual Meeting*, April 2022, Baltimore, MD.

64. MM Benmassaoud*, N Belanger, M Tang, M Deleg, V Beachley, **SL Vega**. Norbornene-modified polycaprolactone for covalent peptide photopatterning. *SFB Annual Meeting*, April 2022, Baltimore, MD.

63. N Belanger*, B Herb, C Burns, J Carter, S Dalwadi, G Gilbert, D Fuller, **SL Vega**, V Beachley. Aligned nanofiber/hydrogel composite scaffolds for peripheral nerve regeneration. *SFB Annual Meeting*, April 2022, Baltimore, MD.

62. K Gultian, R Gandhi, K DeCesari, TW Kim, **SL Vega***. Injectable hydrogel with immobilized BMP-2 mimetic peptides and stem cells for local bone regeneration. *ORS Annual Meeting*, Feb. 2022, Tampa, FL. *New Investigator Recognition Award (NIRA) Finalist*.

61. K Gultian*, R Gandhi, TW Kim, **SL Vega**. Self-forming hydrogels for tissue engineering applications. *BMES Annual Meeting*, Oct. 2021, Orlando, FL.

60. R Gandhi*, K Gultian, K Sarin, M Sladkova, GM de Peppo, **SL Vega**. Assessing the morphology and mechanosensing ability of induced pluripotent stem cells. *BMES Annual Meeting*, Oct. 2021, Orlando, FL.

59. M Butani*, K Driscoll, **SL Vega**. Decellularized plant tissue microtopography regulates stem cell behavior. *BMES Annual Meeting*, Oct. 2021, Orlando, FL.

58. K Driscoll*, M Butani, **SL Vega**. Decellularized plant tissues for biomedical applications. *BMES Annual Meeting*, Oct. 2021, Orlando, FL.

57. A Pacheco Benitez*, B Herb, **SL Vega**. 3D light-degradable hydrogels to study dynamic cell environments. *BMES Annual Meeting*, Oct. 2021, Orlando, FL.

56. M Benmassaoud*, V Carabetta, **SL Vega**. Antimicrobial peptide screening to develop Staphylococcal-resistant films. *The 2021 New York Bacillus Interest Group Annual Symposium*, June 2021, New York, NY.

55. **SL Vega***. Self-forming hyaluronic acid hydrogels for biomedical applications. *Center for Engineering MechanoBiology Seminar*, May 2021, Philadelphia, PA.

54. M Dicerbo, M Benmassaoud, K Gultian, S Miskiel, TW Kim, **SL Vega***. Porous scaffold-hydrogel composite for osteochondral tissue engineering. *Society for Biomaterials World Biomaterials Congress 2020*, Dec. 2020, Virtual.

53. **SL Vega***. Peptide-functionalized hydrogels for biomedical applications. *Cooper Medical School of Rowan University Seminar*, Nov. 2020, Virtual.

52. K Driscoll*, M Butani, **SL Vega**. Stem cell behavior and osteogenic differentiation in plant tissue scaffold materials. *BMES Annual Meeting*, Oct. 2020, Virtual.

51. N Belanger*, C Burns, **SL Vega**, V Beachley. Creating aligned polycaprolactone nanofiber hydrogel composites through layer-by-layer assembly. *BMES Annual Meeting*, Oct. 2020, Virtual.

50. R Gandhi*, K Gultian, TW Kim, **SL Vega**. Gelatin-based bioactive hydrogels for bone tissue engineering applications. *BMES Annual Meeting*, Oct. 2020, Virtual.

49. **SL Vega***. Stem cell therapy: Basic science and current regulations overview. *Regenerative Medicine and Orthobiologics Symposium*, Sept. 2020, Cherry Hill, NJ.

48. **SL Vega***. Hydrogel-based engineering of cellular microenvironments. *Cooper Cancer Research Showcase*, March 2020, Camden, NJ.

47. K Gultian, A Quinones, S Miskiel, TW Kim, **SL Vega***. Osteogenic biomarker expression of mesenchymal stem cells in response to substrate dimensionality and stiffness. *ORS Annual Meeting*, Feb. 2020, Phoenix, AZ.

46. M Dicerbo, M Benmassaoud, S Miskiel, TW Kim, **SL Vega***. Scaffold-hydrogel composite for osteochondral tissue engineering. *ORS Annual Meeting*, Feb. 2020, Phoenix, AZ.

45. **SL Vega***. Hydrogels to investigate stem cell-material interactions. *New York Stem Cell Foundation Seminar*, Oct. 2019, New York, NY.

44. K Gultian*, **SL Vega**. Injectable gelatin-based hydrogels for biomedical applications. *BMES Annual Meeting*, Oct. 2019, Philadelphia, PA.

43. M Benmassaoud*, K Driscoll, GM de Peppo, **SL Vega**. Differences in mechanosensing between MSCs and iPSC derived MSCs. *BMES Annual Meeting*, Oct. 2019, Philadelphia, PA.

42. CJ Robinson*, ME Lowe, M Benmassaoud, **SL Vega**. Stiffness-mediated changes in cell-to-nuclear area of mesenchymal stem cells. *BMES Annual Meeting*, Oct. 2019, Philadelphia, PA.

41. A Quinones*, K Gultian, S Miskiel, TW Kim, **SL Vega**. Effects of dimensionality and stiffness on osteogenic biomarker expression of mesenchymal stem cells. *BMES Annual Meeting*, Oct. 2019, Philadelphia, PA.

40. S Naranjo*, A Venkatakrishnan, **SL Vega**, D Jariwala. Graphene-based microdevices to probe effects of electrical stimulation on stem cell behavior. *BMES Annual Meeting*, Oct. 2019, Philadelphia, PA.

39. DE Mason*, **SL Vega**, SJ Heo, R Daniels, ED Bonnevie, JA Burdick, RL Mauck, JD Boerckel. Transcriptional control of cytoskeletal remodeling and cell motility. *BMES Annual Meeting*, Oct. 2019, Philadelphia, PA.

38. DE Mason*, **SL Vega**, SJ Heo, R Daniels, ED Bonnevie, JA Burdick, RL Mauck, JD Boerckel. Transcriptional control of cytoskeletal remodeling and cell motility. *Society of Engineering Science Annual Meeting*, Oct. 2019, St. Louis, MO.

37. K Gultian*, A Quinones, S Miskiel, TW Kim, **SL Vega**. Single-cell osteogenic biomarkers to evaluate biomaterials for bone tissue engineering. *Life Sciences Future – BioPharm*, Oct. 2019, King of Prussia, PA.

36. M Dicerbo*, M Benmassaoud, S Miskiel, TW Kim, **SL Vega**. Biomaterial composite to recreate the osteochondral interface. *Carnegie Mellon Forum on Biomedical Engineering*, Sept. 2019, Pittsburgh, PA.

35. K Gultian*, A Quinones, S Miskiel, TW Kim, **SL Vega**. Evaluating the progression of mesenchymal stem cell osteogenic biomarker expression in response to biomaterial properties. *Carnegie Mellon Forum on Biomedical Engineering*, Sept. 2019, Pittsburgh, PA.

34. **SL Vega***. Hydrogels for bone and cartilage tissue engineering. *Cooper Bone and Joint Institute Research Day*, June 2019, Camden, NJ.

33. S Furman*, S Naranjo, K Gultian, **SL Vega**. Microenvironmental factors regulate mesenchymal stem cell Notch and YAP signaling. *Rowan University Student Scholars Symposium*, March 2019, Glassboro, NJ.

32. JH Galarraga*, **SL Vega**, MY Kwon, JA Burdick. Combinatorial screening of 3D printable bioinks for cartilage repair. *SFB Annual Meeting*, April 2019, Seattle, WA.

31. S Furman*, S Naranjo, K Gultian, A Loneker, RG Wells, **SL Vega**. Effects of substrate stiffness and cell-cell contact area on stem cell signaling. *Northeast Bioengineering Conference*, March 2019, Piscataway, NJ.

30. **SL Vega***. Gelatin-based hydrogels for musculoskeletal tissue engineering. *Northeast Bioengineering Conference*, March 2019, Piscataway, NJ.

29. **SL Vega***. Engineering stem cell microenvironments for tissue engineering applications. *Society of Hispanic Professional Engineers (SHPE) Engineering Science Symposium*, Nov. 2018, Cleveland, OH.

28. AM Rosales*, **SL Vega**, FW DelRio, JA Burdick, KS Anseth. Reversible control of hydrogel mechanics with irreversible photo-mediated reactions. *American Institute of Chemical Engineers (AIChE) Annual Meeting*, Oct. 2018, Pittsburgh, PA.

27. **SL Vega***, JA Burdick. Engineering stem cell microenvironments for cartilage repair. *7th Annual Musculoskeletal Repair and Regeneration Symposium*, Oct. 2018, New York, NY.

26. **SL Vega***. Hydrogels formed by click chemistry for investigating cellular microenvironments. *Advancing Research in Camden: A Rowan University-Wide Research Symposium*, Oct. 2018, Camden, NJ.

25. **SL Vega***. A hydrogel screening platform for cartilage tissue engineering. *2018 Cartilage Repair Symposium*, Sept. 2018, Philadelphia, PA.

24. J Galarraga, **SL Vega**, L Ouyang, C Highley, JA Burdick*. Extrusion-based 3D printing of biodegradable hydrogels. *8th World Congress of Biomechanics*, July 2018, Dublin, Ireland.

23. AM Rosales*, **SL Vega**, FW DelRio, JA Burdick, KS Anseth. Recapitulating physical changes in the extracellular matrix with dynamic hydrogels. *SFB Annual Meeting*, April 2018, Atlanta, GA.

22. **SL Vega***, MY Kwon, J Durel, KH Song, C Wang, RL Mauck, L Han, JA Burdick. A hydrogel platform to probe the influence of engineered microenvironments on stem cell fate. *Northeast Bioengineering Conference*, March 2018, Philadelphia, PA.

21. **SL Vega***, J Durel, MY Kwon, RL Mauck, JA Burdick. Combinatorial hydrogels with biochemical gradients for probing cell-ECM interactions. *Penn Center for Musculoskeletal Disorders Symposium*, Nov. 2017, Philadelphia, PA.

20. L Chin*, **SL Vega**, AE Loneker, JA Burdick, PA Janmey, RG Wells. Mechanics and hepatocyte behavior in non-alcoholic fatty liver disease. *Physical Sciences-Oncology Network Annual Investigators Meeting*, Oct. 2017, Boston, MA.

19. J Durel*, **SL Vega**, JA Burdick. High-throughput single-cell analysis of MSC mechanosensing. *BMES Annual Meeting*, Oct. 2017, Phoenix, AZ.

18. S Trujillo*, **SL Vega**, JA Burdick, MJ Dalby, M Salmerón-Sánchez. Fibronectin-based hydrogel systems as new 3-dimensional microenvironments for tissue regeneration. *Federation of European Biomedical Societies Workshop: Biological Surfaces and Interfaces*, July 2017, Catalonia, Spain.

17. **SL Vega***, KH Song, C Wang, L Han, JA Burdick. Combinatorial hydrogels and rapid single cell imaging to investigate chondrogenesis in 3D." *Penn Orthopaedics Cartilage Repair Symposium*, April 2017, Philadelphia, PA.

16. **SL Vega***, KH Song, JA Burdick. Combinatorial hydrogels for deciphering the role of cell-hydrogel interactions in MSC chondrogenesis. *SFB Annual Meeting*, April 2017, Minneapolis, MN.

15. YC Yeh*, SR Caliari, **SL Vega**, L Ouyang, L Han, JA Burdick. Modulation of cellular response using mechanically dynamic PDMS substrates. *SFB Annual Meeting*, April 2017, Minneapolis, MN.

14. **SL Vega***, KH Song, C Wang, L Han, JA Burdick. Combinatorial hydrogels and rapid single cell imaging to investigate chondrogenesis in 3D. *Penn Center for Musculoskeletal Disorders Symposium*, Nov. 2016, Philadelphia, PA.

13. **SL Vega***, KH Song, C Wang, L Han, JA Burdick. A combinatorial hydrogel platform to probe stem cell chondrogenesis in 3D. *New Jersey Center for Biomaterials Symposium*, Oct. 2016, Iselin, NJ.

12. **SL Vega***, KH Song, JA Burdick. Development of a combinatorial hydrogel platform for screening 3D cell-biomaterial interactions. *BMES Annual Meeting*, Oct. 2016, Minneapolis, MN.

11. **SL Vega***, SR Caliari, JA Burdick. Cell spreading in 3D hydrogels regulates YAP localization. *Society for Biomaterials World Biomaterials Congress*, May 2016, Montreal, Canada.

10. V Arvind*, **SL Vega**, L McCabe, PV Moghe, NS Murthy, J Kohn. Modulating stem cell-substrate interactions and differentiation by controlling substrate topography via microphase separation. *Society for Biomaterials World Biomaterials Congress*, May 2016, Montreal, Canada.

9. **SL Vega***, MY Kwon, JA Burdick. Single cell imaging to probe early stem cell chondrogenesis in hydrogels. *Penn Center for Musculoskeletal Disorders Symposium*, Nov. 2015, Philadelphia, PA.

8. **SL Vega***, MY Kwon, JA Burdick. Fluorescent imaging to probe MSC chondrogenesis and matrix production in hydrogels. *BMES Annual Meeting*, Oct. 2015, Tampa, FL.

7. MY Kwon*, **SL Vega**, RL Mauck, JA Burdick. Influence of N-cadherin peptide dose and timing on MSC chondrogenesis in 3D HA hydrogels. *BMES Annual Meeting*, Oct. 2015, Tampa, FL.

6. **SL Vega***, PJ Patel, A Freitag, NS Murthy, PV Moghe, J Kohn. Modulating the cellular response by controlling substrate topography via demixing. *New Jersey Center for Biomaterials Symposium*, Oct. 2012, New Brunswick, NJ.

5. E Liu*, **SL Vega**, A Kulesa, H-J Sung, M Becker, J Kohn, PV Moghe. High content imaging-based mapping of stem cell phenotypes. *Stem Cells & Regenerative Medicine World Congress*, Jan. 2011, San Diego, CA.

4. **SL Vega***, E Liu, S Gordonov, PV Moghe. Parsing stem cell behaviors in complex microenvironments via high content imaging and modeling. *BMES Annual Meeting*, Oct. 2010, Austin, TX.

3. **SL Vega***, P Patel, S Gordonov, J Kim, J Kohn, PV Moghe. Utilizing early high-content nuclear features to elucidate downstream stem cell behaviors. *New Jersey Center for Biomaterials Symposium*, Oct. 2010, Bridgewater, NJ.

2. S Gordonov*, **SL Vega**, J Kohn, PV Moghe. Investigation of mesenchymal stem cell proliferation, viability, and differentiation in 3D polymeric scaffolds for tissue regeneration. *Annual National Conference on Undergraduate Research*, April 2010, Missoula, MN.

1. **SL Vega***, S Gordonov, M Treiser, D Cohen, I Androulakis, J Kohn, CS Chen, PV Moghe. Cytoskeleton-based early parsing of human mesenchymal stem cell lineage fates on biomaterials. *BMES Annual Meeting*, Oct. 2009, Pittsburgh, PA.

* Presenting author

Current Funding

4. The Cooper Foundation (402860)
   Injectable Hydrogels with Immobilized Peptides and Stem Cells for Local Orthopedic Tissue Regeneration.
   PI: **Vega** Co-PI: Kim
   Aug. 2022 to July 2025.

3. Graduate School of Biomedical Sciences Seed Funding
   Development of Novel Biofilm-Resistant Hydrogel Coatings
   PI: V Carabetta Co-PI: **Vega**
   Nov. 2021 to Oct. 2022.

2. National Science Foundation (2037055)
   Peptide-Functionalized Hydrogels that Communicate with Preprogrammed Cells
   PI: **Vega** Co-PI: Daringer
   (EAGER) National Science Foundation Division of Materials Research
   Sept. 2020 to June 2023.

1. National Institutes of Health (R21DC018818)
   Handheld 3D Bioprinting of Self-Healing Hydrogels for Vocal Fold Reconstruction
   PI: Miri Co-PI: **Vega**
   (R21) National Institute of Deafness and Other Communication Disorders
   Aug. 2020 to July 2023.

Previous Funding

1. Camden Health Research Initiative
   Injectable Hydrogels for Delivering Biologics to Reduce the Incidence of Osteoporosis-Related Hip Fractures
   PI: **Vega** Co-PI: Kim
   Jan. 2019 to June 2022.

Professional Development

- NSF Square-Table 2: Programmable Interfaces Workshop (2019)
  Arlington, VA
- NSF ENG CAREER Proposal Writing Workshop (2019)
  Organized by Kansas State University, Arlington, VA
- National Effective Teaching Institute (2019)
  Organized by ASEE, San Diego, CA
- Faculty Development Symposium (2018)
  Organized by SHPE, Cleveland, OH
- Rising Stars in Biomedical Workshop (2017)
  MIT, Boston, MA
- Institute on Teaching and Mentoring (2016)
  Organized by Compact for Faculty Diversity, Tampa, FL
- Future Faculty Career Exploration Program (2013)
  RIT, Rochester, NY

Teaching and Mentoring Experience

Courses at Rowan University

Professor, Chemical Foundations in Biomedical Engineering (BME 11.201)
Fall 2022

Professor, Biological Transport Phenomena (BME 11.610)
Fall 2018, Fall 2019, Fall 2020, Spring 2022

Professor, Introduction to Stem Cell Engineering (BME 11.490)
Spring 2020, Fall 2020, Fall 2021

Professor, Advanced Stem Cell Engineering (BME 11.590)
Spring 2020, Fall 2020, Fall 2021

Courses at Rutgers University

Teaching Assistant, Chemical Engineering Design & Economics I (CBE 14.155.427) (2010)
Instructor: Alkis Constantinides
Teaching Assistant, Thermodynamics I (CBE 14.155.208) (2010)
Instructor: Silvina Tomassone

Graduate Students mentored at Rowan University

- Masha Khodabakhshmajd, BME Ph.D. (2022 – Present)
- Umu Jalloh, BME Ph.D. (2022 – Present)
- Daniel Ball, BME M.S. (2022 – Present)
- Brandon Herb, BME M.S. (2019 – Present)
- Kirstene Gultian, BME Ph.D. (2018 – 2022)
- Mehdi Benmassaoud, BME Ph.D. (2018 – 2022)
- Matthew Lowe, BME M.S. (2021 – 2022)
- Sarah Furman, BME M.S. (2020 – 2021)
- Matthew DiCerbo, BME M.S. (2018 – 2021)

Undergraduate Students mentored at Rowan University

- Tulika Khanna, Biological Sciences B.S. (2022 – Present)
- Josh de Guzman, BME B.S. (2022 – Present)
- Marissa Pestritto, BME B.S. (2022 – Present)
- Raaha Kumaresan, BME B.S. (2022 – Present)
- Arielle Gsell, BME B.S. (2022 – Present)
- James MacAulay, BME B.S. (2022 – Present)
- Kayla DeCesari, BME B.S. (2021 – Present)
- Abigail McSweeny, BME B.S. (2021 – Present)
- Shrey Dalwadi, BME B.S. (2020 – Present)
- Aryanna Copling, ***U-RISE Fellow*** (2021 – Present)
- Abby Madden, BME B.S. (2021 – 2022)
- Katie Driscoll, BME B.S., ***Goldwater Scholar*** (2018 – 2022)
- Matthew Lowe, BME B.S. (2019 – 2021)
- Gatha Adhikari, BME B.S. (2019 – 2021)
- Roshni Gandhi, BME B.S. (2019 – 2021)
- Khushi Sarin, BME B.S. (2019 – 2021)
- Sarah Furman, BME B.S. (2018 – 2020)
- Sebastian Naranjo, BME B.S. (2018 – 2020)
- Alexis Pacheco Benitez, NSF REU (Summer 2021)
- Antonio Quinones, NSF REU (Summer 2019)

High School Students mentored at Rowan University

- Maya Butani, Research Assistant (2019 – 2022)
- Leila Quatorze, Summer Volunteer (2021, 2022)
- Jillian Smith, Summer Volunteer (2021, 2022)
- Luke Siri, Summer Volunteer (2021)
- Gavi Melman, RISER Scholar (2022)
- Matthew Rondinella, RISER Scholar (2019)
- Roshan Patel, RISER Scholar (2019)

Students mentored at the University of Pennsylvania

- John Durel, NSF Center for Engineering MechanoBiology REU Program (2017)
- Sara Trujillo-Muñoz, Visiting Scholar, BME graduate at University of Glasgow (2016)
- John Bricker, NSF Research Experience for Teachers Program (2016)
- Evan Herlihy, BE M.S. (2015)

Students mentored at Rutgers University
- Alejandra Aguilar, NSF REU (2013)
- Varun Arvind, BME B.S. (2012 – 2014)
- Erica Harris, NSF REU (2012)
- Adam Freitag, CBE B.S. (2011 – 2012)
- Gabriel Suarez, NSF REU (2011)
- Parth Patel, BME B.S. (2010 – 2012)
- Anthony Kulesa, BME B.S. (2010 – 2012)
- Simon Gordonov, BME B.S. (2008 – 2010)

Professional Service

Institutional Appointments

Member, Diversity, Equity, and Inclusion (DEI) Steering Committee (2022 – Present)
Member, Health Professions Advisory Committee (2020 – Present)
Member, Institutional Animal Care and Use Committee (2019 – Present)

Academic Outreach

Chair, BME Outreach and Community Engagement (2020 – Present)
Faculty Lead, BEAM (BioEngineering & Me) Program (2021 – Present)
Faculty Lead, RISER Program (2019 – Present)

Conference Organization

Session chair & organizer, SFB World Biomaterials Congress Meeting (2020)
Session co-chair, BMES Annual Meeting (2019, 2020, 2021, 2022)
Session co-chair, SFB Annual Meeting (2017)

Editorial Boards

Review Editor, Frontiers in Biomaterials Science (2021 – Present)
Guest Editor, JoVE Methods Collection "Recent Advances in Hydrogel Design and Imaging-Based Analysis to Probe Cell-Material Interactions" (2020 – Present)

Journal Reviewer

Advanced Materials (2022 – Present)
Advanced Healthcare Materials (2022 – Present)
Annals of Biomedical Engineering (2022 – Present)
Frontiers in Medical Technology (2022 – Present)
ACS Applied Bio Materials (2021 – Present)
Communications Materials (2021 – Present)
Frontiers in Bioengineering and Biotechnology (2021 – Present)
Current Opinion in Biomedical Engineering (2021 – Present)
Chemical Reviews (2021 – Present)
Drug Delivery and Translational Research (2021 – Present)
Materials Horizons (2020 – Present)
Materials Science & Engineering C (2020 – Present)
Journal of Materials Chemistry B (2020 – Present)
Journal of Cellular Physiology (2020 – Present)
RCS Advances (2019 – Present)
ACS Applied Materials & Interfaces (2019 – Present)
ACS Biomaterials Science & Engineering (2018 – Present)
Acta Biomaterialia (2017 – Present)

Professional Memberships

Affiliate Member, Center for Engineering MechanoBiology (CEMB)
Affiliate Member, Penn Center for Musculoskeletal Diseases (PCMD)
Member, Biomedical Engineering Society (BMES)
Member, Society for Biomaterials (SFB)
Member, Orthopaedic Research Society (ORS)
Member, American Chemical Society (ACS)