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| 2/21/2019 Curriculum Vitae | | Vernon, Brent, Leon | | |
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| NAME  **Brent Leon Vernon**  brent.vernon@asu.edu | | POSITION TITLE  Associate Professor  Director, Center for Interventional Biomaterials | | |
| 20376 E. Carriage Way  Queen Creek, AZ 85142  480 352 6926 [fax 480 727 7624] | |
| EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)* | | | | |
| INSTITUTION AND LOCATION | DEGREE  *(if applicable)* | | YEAR(s) | FIELD OF STUDY |
| Arizona State University | BSE | | 1993 | Biomedical Engineering |
| University of Utah | Ph.D. | | 1999 | Bioengineering |
| University of Zurich/ETHZ | Postdoc | | 1999-2000 | Biomaterials |
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|  |  | |  |  |

**EXPERIENCE**

2006-Present **Associate Professor of Biomedical Engineering**, School of Biological and Health Systems Engineering, ARIZONA STATE UNIVERSITY, Tempe, AZ

2018-Present **Undergraduate Program Chair**, Biomedical Engineering Program, School of Biological and Health Systems Engineering, ARIZONA STATE UNIVERSITY, Tempe, AZ

2020-Present **Adjunct Associate Professor**, Barrows Neurological Institute and St. Joseph Hospital and Medical Center, Phoenix, AZ

2006-Present **Director**, Center for Interventional Biomaterials, Fulton School of Engineering, ARIZONA STATE UNIVERSITY, Tempe, AZ

2005-Present **Honors Disciplinary Faculty**, Barrett Honors College, ARIZONA STATE UNIVERSITY, Tempe, AZ

2020-Present **Consultant,** NuShores Biosciences LLC, Little Rock, AR

2019-Present **Advisor**, Droplet LLC, Tempe, AZ

2012-2018 **Board of** **Directors and Co-Founder**, Sonoran Biosciences Inc., Chandler, AZ

2013-Present **Co-Founder**, Aneuvas Technologies, Inc., Flagstaff, AZ

2009-2012 **Graduate Program Chair**, School of Biological and Health Systems Engineering, ARIZONA STATE UNIVERSITY, Tempe, AZ

2011 **Consultant**, CCa Industries LLC, NJ

2009-2010 **Consultant,** Law Firm, Santa Monica, CA

2006-2009 **Graduate Program Director**, Harrington Department of Bioengineering, ARIZONA STATE UNIVERSITY, Tempe, AZ

2007-2008 **Consultant,** EmberStone Technologies, LLC, Phoenix, AZ

2004-2006 **Consultant**, Human Biofilm Technologies, LLC, Scottsdale, AZ

2000-2005 **Consultant**, Trivascular, LLC, Santa Barbara, CA

2000-2006 **Assistant Professor**, Harrington Department of Bioengineering, ARIZONA STATE UNIVERSITY, Tempe, AZ

1999-2000 **Research Associate**, Institute for Biomedical Engineering and Medical Informatics, UNIVERSITY OF ZURICH, Zurich, Switzerland,

ENDOSPINE AG Cham, Switzerland

1993-1999 **Research Assistant**, Graduate Student, Department of Bioengineering, Center for Controlled Chemical Delivery, UNIVERSITY OF UTAH, Salt Lake City, UT

**HONORS/AWARDS**

2013-2020 STTR/SBIR grants NIH

2010-2013 National Past-President, Alpha Eta Mu Beta <Bioengineering Honor Society>

2008-2010 National President, Alpha Eta Mu Beta

2007-2010 Arizona Biomedical Research Commission Research Grant

2007-2012 American Heart Grant-in-Aid

2007 Nominated ASU Parent’s Association 2007 Professor of the Year

2006-2009 Arizona Biomedical Research Commission Research Grant

2006 NAE/IOM Young Investigator Travel Award (Vaccine Production Symposium)

2004-2014 Ad-hoc Member of various NIH study sections

2003-2009 NIH RO1 Award ‘Time-dependent LCST materials’

2000-2001 American Heart Beginning Grant-in-Aid ‘Temp-sens. Polymers for AVM embolization’

1995/96 Biobased Engineering Fellowship/University of Utah Bioengineering

1995/96 Curtis C. Johnson Fellowship/ University of Utah Bioengineering

1994/95 University of Utah-NIH Training Grant Fellowship/Center for Biopolymers at Interfaces

**PUBLICATIONS**

#### Refereed Archival Journal Papers <2916 citations; h-index 29; i10-index 52>

66. Heffernan JM, McNamara JB, Vernon B, Mehta S, Sirianni R, PNJ scaffolds promote microenvironmental regulation of glioblastoma stem-like cell enrichment and radioresistance, Biomaterials Science, (2022).

65. Christopher ZK, Tran CP, Vernon B, Spangehl MJ, What is the duration of irrigation? An in-vitro study of the time to eradicate bacteria with common irrigation solutions, The Journal of Arthroplasty, (2021). <https://doi.org/10.1016/j.arth.2021.10.013>

64. Xu Weiheng, Jambulkar S, Ravichandran D, Zhu Y, Kakarla M, Qiong N, Azeredo B, Chen X, Jin K, Vernon B, Lott D, Cornella J, Shefi O, Miquelard-Granier G, Yang Y, Song K, 3D printing-enabled nanoparticle alignment: a review of mechanisms and applications, SMALL, (2021).

63. Xu W, Jambulkar S, Zhu Y, Ravichandran D, Kakarla M, Vernon B, Lott DG, Cornella JL, Shefi O, Miquelard-Garnier G, Yang Y, Song K, 3D printing for polymer/particle-based processing: A review, Composites Part B: Engineering, (2021).

62. Heffernan JM, Vernon BL, McLemore RY, Nagy T, Moore RC, Badha VS, Childers EP, Nguyen MB, Gentry DD, Calara FM, Saunders WB, Feltis T, McLaren AC, Overstreet D, In vivo evaluation of temperature responsive antimicrobial-loaded PNIPAAm hydrogels for prevention of surgical site infections, Journal of Biomaterials Research-Part B, (2021).

61. Heffernan JM, Overstreet DJ, **Vernon BL**, McLemore RY, Nagy T, Moore RC, Badha VS, Childers EP, Nguyen MB, Gentry DD, Calara FM, Saunders WB, Feltis T, McLaren AC, Safety and efficacy of temperature-responsive antimicrobial-loaded hydrogels for prevention of surgical site infections, Nature Biomedical Engineering, (Submitted)

60. Pal A, Smith C, Palade J, Nagaraju S, Alarcon-Benedetto B, Kilbourne J, Rawls A, Wilson-Rawls J, **Vernon B,** Nikkhah M, Poly(N-isopropylacrylamide)-based Dual-Crosslinking Biohybrid Injectable Hydrogels for Vascularization, Acta Biomaterialia, 107, 138-151, (2020).

59. Overstreet DJ, Lee EJ, Pal A, **Vernon BL**, In situ crosslinking temperature-responsive hydrogels, with improved delivery, swelling, and elasticity for endovascular embolization, JBMR B., (submitted).

58. Heffernan JM, McNamara J, **Vernon BL**, Mehta S, Sirianni RW, Microenvironment-induced plasticity and radiation resistance of patient derived glioblastoma stem-like cells cultured within nutrient-rich, thermally reversible poly(NIPAAm-co-JAAm) scaffolds, Acta Biomaterialia, (submitted).

57. Overstreet D, Bahda VS, Heffernan JM, Childers EP, Moore RC, V**ernon BL**, McLaren AC, Temperature-responsive PNDJ hydrogels provide high and sustained antimicrobial concentrations in surgical sites, Drug Delivery and Translational Research, 9(4), 802-815, (2019).

56. Pal A, Tripathi K, Pathak C, **Vernon BL,** Plasma-based fasts gelling biohybrid gels for biomedical applications, Scientific Reports, 9, 10881 (1-10), (2019).

55. Pal A, **Vernon BL\*,** Nikkhah M\*, Therapeutic neovascularization promoted by injectable hydrogels, Bioactive Materials, 3(4), 389-400, (2018). <2>

54. Pal A, Pathak C, **Vernon BL**, Synthesis, Characterization and Application of Biodegradable Polymer Grafted Novel Bioprosthetic Tissue, Journal of Biomedical Material Science, Polymer Edition, 29(3), 217-235, (2018). <1>

53. Yokoda R, Nagalo B, **Vernon B**, Oklu R, Albadawi H, DeLeon T, Zhou Y, Egan J, Duda D, Borad M, Oncolytic virus delivery, Oncolytic Virotherapy, 6, 39-49, (2017). <2>

52. *Heffernan JM*, McNamara JB, Borwege S, **Vernon BL**, Sanai N, Mehta S, Sirianni R, PNIPAAm-co-Jeffamine®(PNJ) scaffolds as in vitro models for niche enrichment of glioblastoma stem-like cells, Biomaterials, 143, 142-148, (2017). <https://doi.org/10.1016/j.biomaterials.2017.05.007> <6>

51. *Navaie A, Truong D, Heffernan J, Cutts J,* Overstreet D, Sirriani R, Brafman D, **Vernon B**, Nikkhah M, PNIPAAm-based biohybrid injectable hydrogel for cardiac tissue engineering, Acta Biomaterialia, 32, 10-23, 2016. <28> [IF 6.0]

50. *Heffernan J*, Overstreet D, *Srinivasan S*, **Vernon B\***, Sirianni RW\*, Temperature responsive hydrogels enable transient three-dimensional tumor cultures via rapid cell recovery, Journal of Biomedical Materials Research, Part A, 104(1), 17-25, (2016). DOI:10.1002/jbm.a.35534 <9>

49. Overstreet D, McLaren A, Calara F, **Vernon B**, McLemore R\*, Local gentamicin delivery from resorbable viscous hydrogels is therapeutically effective, Clinical Orthopaedics and Related Research, 473(1): 337-347, (2015). DOI:10.1007/s11999-01439535-9 <16> [IF 2.8]

48. Heffernan JM, Overstreet D, Le LD, **Vernon BL**, Sirianni RW\*, Bioengineered scaffolds for 3D analysis of glioblastoma proliferation and invasion, Annals of Biomedical Engineering, 43(8): 1965-1977, (2015). DOI:10.1007/s10439-014-1223-1 <23>

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46. *Brennecka CR*, Preul MC, Becker TA, **Vernon BL\***, In vivo embolization of lateral wall aneurysms in canines using liquid-to-solid gelling PPODA-QT polymer system: 6-month pilot study, Journal of Neurosurgery, 119(1), 228-238, (2013).  [IF 5.9] <2>

45. *Bearat HH*, Preul MC, **Vernon BL\***, Cytotoxicity, in vitro models and preliminary in vivo study of dual physical and chemical gels for endovascular embolization of cerebral aneurysms, Journal of Biomedical Materials, Part A, 101, 2515-2525, (2013). DOI: 10.1002/jbm.a.34554  <10>

44. *Lee BH, Bearat HH*, *Cheng VA*, McLemore R, *Robb SA, Cui Z*, Dovigi A, **Vernon BL\***, In vitro and in vivo demonstration of a physically and chemically in situ gelling NIPAAm-based copolymer system, Journal of Biomaterials Science, Polymer Edition, 24(13), 1575-1588, (2013). DOI:10.1080/09205063.2013.781939. <2>

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42. *Overstreet D, Huynh R,* Jarbo K, McLemore R, **Vernon B\***, In situ-forming, resorbable graft copolymer hydrogels providing controlled drug release, Journal of Biomedical Materials Research, Part A, 101(5), 1437-1446, (2013). 10.1002/jbm.a.34443 <25>

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35. Lee BH, *Leon C*, McLemore R, *Macias JV*, **Vernon BL**\*, Synthesis and characterization of thermo-sensitive radio-opaque poly(N-isopropylacrylamide-co-PEG-2-iodobenzoate), Journal of Biomaterials Science, Polymer Edition, 22(17), 2357-2367, (2011).  <1>

*34. Bearat H*, Lee BH, *Valdez Macias J*, **Vernon BL**\*, Synthesis, characterization and properties of a physically and chemically gelling polymer system using poly(NIPAAm-co-HEMA-acrylate) and poly(NIPAAm-co-cysteamine), Journal of Biomaterials Science, Polymer Edition, 22(10), 1299-1318, (2011).  <9>

*33. Riley CM*, McLemore R, Preul MC, **Vernon BL**\*, Gelling process in reverse emulsion, in situ gelling polymeric materials formulated with liquid radio-opaque agents, Journal of Biomedical Materials Research Part B, 96, 47-56, (2011).  <10>

*32. Overstreet DJ, Dhruv HD*, **Vernon BL**\*, Bioresponsive copolymers of poly(N-isopropylacrylamide) with enzyme-dependent lower critical solution temperatures, Biomacromolecules, 11(5), 1154-1159, (2010). <22>

31. McLemore R, *Lunt BN, Salameh S*, DiBaise JK, Crowell MD, **Vernon BL\***, Development of a transmucosal technique for erythromycin delivery to treat gastroparesis, Journal of Pharmaceutical Sciences, 99(6), 2905-2913, (2010).  <3>

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29. Nugent M, McLaren AC, **Vernon BL**, McLemore R\*, Strength of antimicrobial bone cement decreases with increased poragen fraction, Clinical Orthopaedics and Related Research, 468(8), 2101-2106, (2010).  <20>

*28.* *Blakley B*, Lee BH, *Riley C*, McLemore R, **Vernon BL**\*, Formulation and mechanical, kinetic and visual characterization of radio-opaque conjugated in situ-gelling materials, Journal of Biomedical Materials Research Part A, 93B, 9-17, (2010).  <5>

27. McLemore R, *Robb SA*, Lee BH, Caplan MR, **Vernon BL\***, Michael-type addition reactions in NIPAAm-cysteamine copolymers follow second order rate laws with steric hindrance, Annals of Biomedical Engineering, 37, 2416-2425, (2009). <6>

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*25. Leon C, Lee BH,* Preul M, *McLemore R,* **Vernon BL\***, Synthesis and characterization of radiopaque thermosensitive poly(NIPAAm-EDBEA-2,3,5-triiodobenzamide), Polymer International, 58, 847-850, (2009). <3>

*24. McLemore R*, *Lee BH,* **Vernon BL\***, Surfactant effects on the kinetics of Michael-type addition reaction in reverse emulsion polymeric systems, Journal of Biomedical Materials Research, 89B(1), 191-198, (2009). <3>

*23. Henderson E,* ***Lee BH****, Cui Z,* ***McLemore R****,* Brandon TA*,* **Vernon BL\*,** In vivo evaluation of temperature-sensitive polymer with time dependent LCST, Journal of Biomedical Materials Research, 90A, 1186-1197, (2009). <20>

22. McLaren RL, McLaren AC, **Vernon BL\***, Generic tobramycin elutes from bone cement faster than proprietary tobramycin, Clinical Orthopaedics and Related Research, 466(6), 1372-1376, (2008). <18>

*21. Robb SA, Lee BH, McLemore R,* **Vernon BL\***, Simultaneously physically and chemically gelling polymer system utilizing a poly(NIPAAm-co-cysteamine) based copolymer, Biomacromolecules, 8(7), 2294-2300, (2007). <72>

*20. French SS*, *McLemore R*, **Vernon B**, Johnston GIH, ***Moore MC\****, Corticosterone modulation of reproductive and immune systems trade-offs in female tree lizards: Long-term corticosterone manipulation via injectable gelling material, Journal of Experimental Biology, 210(16), 2859-2865, (2007). <57>

*19.* *Cheng V, Lee BH*, ***Pauken C***, **Vernon BL\***, Poly(N-isopropylacrylamide-co-poly(ethylene glycol) acrylate) simultaneously physically and chemically gelling polymer systems, Journal of Applied Polymer Science, 106, 1201-1207 (2007). <28>

18. McLaren AC\*, McLaren SG, *McLemore R,* **Vernon B**, Particle size of fillers affects permeability of polymethylmethacrylate, Clinical Orthopaedics and Related Research, 461, 64-67, (2007). <24>

17. *Cui Z, Lee BH*, **Vernon BL**\*, New hydrolysis-dependent thermosensitive polymer for an injectable degradable drug delivery system, Biomacromolecules, 8(4), 1280-1286, (2007). <55>

***16. Solis FJ***\*, **Vernon B**, Control of gel swelling and phase separation of weakly charged thermo-reversible gels by salt addition, Macromolecules, 40, 3840-3847, (2007). <5>

15. Beck J, Angus R, Massen B, Britt D, **Vernon B**, Nguyen KT\*, Islet Encapsulation –Strategies to enhance islet cell survival and functions, Tissue Engineering, 13(3), 589-599, (2007). <189>

*14. McLemore R,* Preul MC, **Vernon BL\***, Controlling Delivery Properties of a Waterborne, In Situ-Forming Material, Journal of Biomedical Materials Research: Part B-Applied Biomaterials, 79B(2), 398-410, (2006). <17>

13. ***Lee BH****, West B,* ***Pauken C***, **Vernon BL**\*, In-situ Injectable Physically and Chemically Gelling NIPAAm-based Copolymer System for Embolization, Biomacromolecules, 7 (6), 2059 -2064, (2006). <103>

*12.* *Birdno M*, **Vernon B\***, Mechanical optimization of an arteriovenous malformation embolization material: A predictive model analysis, Annals of Biomedical Engineering, 33(2), 191-201, (2005). <6>

*11. McLemore R*, ***Aerni G, Brandon T***, Roy KH, **Vernon B\***, Tubal sterilization using a water-borne poly(ethylene glycol) in situ cross-linking material: A non-surgical approach, Fertility and Sterility, 83(4S), 1284-1292 (2005). <6>

*10. Lee BH*, **Vernon BL\***, Copolymers of *N*-isopropylacrylamide, HEMA-lactate and acrylic acid with time-dependent lower critical solution temperature as a bioresorbable carrier, Polymer International, 54, 418-422, (2005). <38>

9**. Vernon BL\***, *Martinez A*, Gel strength and solution viscosity of temperature-sensitive, in situ-gelling polymers for endovascular embolization, Journal of Biomaterial Science: Polymer Edition, 16(9), 1153-1166, (2005). <10>

8***. Solis FJ\*****, Weiss-Malik R*, **Vernon B**, Local monomer activation model for phase behavior and calorimetric properties of LCST gel-forming polymers, Macromolecules, 38, 4456-4464, (2005). <13>

*7. Lee BH*, **Vernon BL\***, In Situ-Gelling, Erodible N-isopropylacrylamide Copolymers, Macromolecular Biosciences, 5, 629-635, (2005). <42> {Cover Article}

6**. Vernon BL\***, *Fusaro F, Borden B*, Roy KH, Partition-controlled progesterone release from waterborne, in situ-gelling materials, International Journal of Pharmaceutics, 274(1-2), 191-200, (2004). <15>

*5.* *Weiss-Malik R,* ***Solis F***, **Vernon B\***, Independent control of LCST and swelling behavior with pH for poly(N-isopropylacrylamide-co-maleic acid), Journal of Applied Polymer Science, 94(5), 2110-2116, (2004). <19>

4**. Vernon BL**, Tirelli N\*, Baechi T, Haldiman D, Hubbell JA, Water-borne, in situ cross-linked biomaterials from phase segregated precursors, Journal of Biomedical Materials Research, 64A, 447-456, (2003). <84>

3**. Vernon BL**, Kim SW, Bae YH\*, Thermoreversible copolymer gels for extracellular matrix, Journal of Biomedical Material Research 51(1), p. 69-79 (2000). <110>

2**. Vernon BL**, Kim SW, Bae YH\* Insulin release from islets of Langerhans entrapped in a poly(N-isopropylacrylamide-co-acrylic acid) polymer gel, Journal of Biomaterial Science, Polymer Edition, 10, p. 183-198(1999). <69>

1. Bae YH\*, Han CK, **Vernon B**, Kim SW, Extracellular matrix for a rechargeable cell delivery system, Journal of Controlled Release 53, p. 249-258 (1998). <47>

#### National Conference Proceedings Reviewed Papers

**Vernon BL,** Gutowska A, Kim SW, Bae YH\* Thermally reversible polymer gels for biohybrid artificial pancreas, MACROMOLECULAR SYMPOSIA, 109, p. 155-167 (1996). <53>

*Powell S*, ***Williams M, Nieman R***, **Vernon BL\***, N-Isopropylacrylamide copolymer with Isovanillin (model of chemotherapy agent phenstatin), Journal of Controlled Release, 91 (1-2): 256-258 (2003).

*Lee BH*, **Vernon BL\***, *N*-isopropylacrylamide-based Copolymers with Time-dependent LCST for a Bioresorbable Carrier, Mater. Res. Soc. Symp. Proc., 845: AA5.6.1-AA5.6.6 (2004).

*Curd T*, **Vernon BL**, ***Pauken C, Sundararajan R\*,*** Optimization of Electroporation Parameters for Human Ovarian Cancer Cells, Proceedings of the Electrostatics Society of America 2005 Annual Meeting, (2005).

*Leon C*, Francisco S, **Vernon BL**, Phase behavior and shrinking kinetics of thermo-reversible poly(N-isopropylacrylamide-2-hydroxyehtylmethacrylate), 2009 MRS Spring Meeting Proceedings, (2009). <6>

#### Books/Book Chapters (Edited, Authored)

Sundararajan R, Natarajan A, Sankaranarayanan K, Reece LM, **Vernon B**, Low and high voltage electroporation of in vitro human ovarian adenocarcinoma cells, In R Sundararajan (ed.) Electroporation-based therapies for cancer: From basics to clinical applications, (2014).

**Vernon B** (Editor), Injectable biomaterials: Science and applications, Philadelphia: Woodhead Publishing, (2011). <2>

*Overstreet DJ,* VonRecum HA, **Vernon BL**, Drug delivery applications of injectable biomaterials, In B Vernon (Ed.), Injectable biomaterials: Science and applications, pp. 95-141, Philadelphia: Woodhead Publishing, (2011).

**Vernon BL**, *Riley C*, Vascular applications of injectable biomaterials, In B Vernon (Ed.), Injectable biomaterials: Science and applications, pp. 183-201, Philadelphia: Woodhead Publishing, (2011).

*Bearat HH*, **Vernon BL**, Environmentally responsive injectable materials, In B Vernon (Ed.), Injectable biomaterials: Science and applications, pp. 263-297, Philadelphia: Woodhead Publishing, (2011).

**Vernon BL\***, Wegner M, Controlled Release, In Encyclopedia of Biomaterials and Bioengineering, Marcel Dekker, p. 384-391, (2004).

#### Reviewed Abstracts, Presentations and Posters

**Vernon BL**, Gutowska A, Bae YH\*, Kim SW, Thermally reversible polymer gels for biohybrid artificial pancreas, 36th Microsymposium on Macromolecules- High Swelling Gels, Prague, Czech Republic. (July 1995)

**Vernon BL**, Kim SW, Bae YH\*, Synthetic extracellular matrix for islets of Langerhans in development of biohybrid artificial pancreas using thermally reversible polymer gels, Fifth World Biomaterials Congress, Toronto, Canada, (May/June 1996)

**Vernon BL**, Kim SW, Bae YH\*, Diffusion properties of poly(N-isopropylacrylamide-co-acrylic acid) used for a refillable biohybrid pancreas, Eighth Intern. Symp. On Recent Advances in Drug Delivery Systems, Salt Lake City, Utah, (Feb. 1997)

**Vernon BL**, Kim SW, Bae YH\*, Insulin diffusion kinetics from islets in a thermally reversible polymer matrix, Abstracts of Papers of the American Chemical Society, 213: 392-COLL, Part 1 APR 13 1997, presented at the 213th American Chemical Society National Meeting, San Francisco, California, (Apr. 1997)

Tirelli N, **Vernon BL**, Napoli A, Hubbell JA\*, Poly(ethylene glycol) materials obtained through Michael-type addition, Sixth World Biomaterials Congress, Kamuela, Hawaii, (May 2000)

**Vernon BL**, Tirelli N, Haldimann D, Hubbell JA\*, In-Situ Crosslinking Biomaterials from Phase Segregated Precursors, 27th Annual Society for Biomaterials Meeting, St. Paul, Minnesota, (Apr. 2001)

*Pfister M*, **Vernon BL\***, N-isopropylacrylamide copolymers with time dependent LCST, Biomedical Engineering Society's Conference, Durham, North Carolina, (Oct. 2001)

*Powell S***, *Williams MD, Nieman RA***, **Vernon BL\***, N-Isopropylacrylamide copolymer with Isovanillin (model of chemotherapy agent phenstatin), 2nd International Symposium on Tumor Targeted Delivery Systems, Rockville, Maryland, (Sept. 2002).

*Lugo A*, **Vernon BL\***, Temperature responsive solutions with minimal syneresis, minimal viscosity, and maximal strength for endovascular embolization, Society for Biomaterials 29th Annual Meeting, Reno, Nevada (Apr. 2003).

**Vernon BL\*,** *Kim E, Pfister M,* ***Pettit GR***, N-isopropylacrylamide copolymers for drug delivery, 30th Annual Controlled Release Society Meeting, Glasgow Scotland, (July 2003)

**Vernon BL\*,** *Fusaro F, Borden B,* Roy KH, Progesterone release from intrafallopian tube gelling materials, 2003 MRS Fall Meeting, Boston, Mass. (Dec. 2003).

*Weiss-Malik R*, **Vernon BL\***, pH-sensitivity of poly(N-isopropylacrylamide-co-maleic acid) for oral vaccine delivery systems, 2003 MRS Fall Meeting, Boston, Mass. (Dec. 2003).

**Vernon BL\***, *McLemore R, Borden B*, Bichard W, Pruel M, Roy KH, In situ-gelling dispersions and reverse emulsions and their medical applications, 2004 European Polymer Conference, Gargnano, Italy, (Jun. 2004).

*Lee BH*, **Vernon BL\***, Copolymers of N-isopropylacrylamide, HEMA-lactate, and Acrylic Acid with Time-dependent LCST for a Bioresorbable Carrier, 2004 MRS Fall Meeting, Boston, Mass. (Dec. 2004).

*Cui Z, Lee BH*, **Vernon BL\***, N-isopropylacrylamide copolymer with dimethyl-gamma-butryolactone acrylate with hydrolysis-dependent lower critical solution temperature, 2005 MRS Spring Meeting, San Francisco, CA. (March 2005).

***Solis FJ\****, *Larance J, Weiss-Malik R*, **Vernon BL**, Experimental determination and modeling of phase and calorimetric properties of gel-forming polymers with a lower critical solution temperature (LCST), 2005 MRS Spring Meeting, San Francisco, CA. (March 2005).

*Curd T*, **Vernon BL**, ***Pauken C, Sundararajan R\****, Optimization of Electroporation Parameters for Human Ovarian Cancer Cells, Electrostatics Society of America 2005 Annual Meeting, Edmonton, Canada, (June 2005).

*McLemore R,* Preul M,**Vernon BL\*,** Controlling in situ gelation of waterborne, phase-segregated precursors for vascular embolization,2005 BMES Annual Meeting, Baltimore, MD. (Oct. 2005).

*Cui Z, Lee BH,* **Vernon BL\*,** N-isopropylacrylamide-based Copolymer with Hydrolysis-dependent Lower Critical Solution Temperature as Injectable, Bioresorbable Gelling Materials for Controlled Drug Delivery, Society for Biomaterials 2006 Annual Meeting, Pittsburg, PA (Apr. 2006). <1>

**Vernon BL**\*, *Robb S, Cheng V, West B, Lee BH,* Simultaneous physical and chemical in situ-gelling material for vascular embolization, 2006 BMES Annual Meeting, Chicago, IL. (Oct. 2006).

*McLemore RY*, **Vernon BL**\*, Surfactant effect on gelation in an in situ-forming reverse emulsion polymeric system for tissue reconstruction, Society for Biomaterials 2007 Annual Meeting, Chicago, IL (Apr. 2007).

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*Cui ZW*, ***Lee BH***, **Vernon BL\***, Hydrolytically degradable temperature sensitive polymer for injectable drug delivery, 2007 Biomedical Engineering Society Annual Meeting, Los Angeles, CA (Sept. 2007).

***Lee BH***, *Robb S*, **Vernon BL\***, In situ-gelling materials via simultaneous physical/chemical cross-linking for embolization, 2007 Biomedical Engineering Society Annual Meeting, Los Angeles, CA (Sept. 2007).

**Vernon BL**\*, *McLemore R*, Sequential physical and then chemical gelling materials for safe controlled endovascular embolization, Second International Conference on Mechanics of Biomaterials & Tissues, Lihue, Kaua’I, HI (Dec. 2007).

*Bearat H*, **Vernon BL\***, Improved Materials for Endovascular Embolization, Annual Controlled Release Society Meeting, New York City, NY (July 2008).

*Salameh S*, DiBaise J, **Vernon BL\***, Buccal Delivery of Erythromycin lactobinate to treat Gastroparesis, Annual Controlled Release Society Meeting, New York City, NY (July 2008).

***Lee BH***, *Leon C*, Preul M, **Vernon BL\***, Thermo-sensitive radiopaque copolymers for embolization, Annual Controlled Release Society Meeting, New York City, NY (July 2008).

*Cui Z*, ***Lee BH***, *Lunt B*, **Vernon BL\***, Degradation and Sustained Release from Injectable, Bioresorbable, Thermosensitive Copolymer, Poly(NIPAAm-co-dimethyl-gamma-butyrolactone acrylate-co-acrylic acid), Annual Controlled Release Society Meeting, New York City, NY (July 2008).

*Blakely BL*, ***Lee B***, *Riley C*, ***McLemore R***, **Vernon B\*,** Formulation and Characterization of Radio-opaque conjugated in situ-gelling materials, Society for Biomaterials Annual Meeting, San Antonio, TX (Apr 2009).

*Riley C*, ***McLemore R***, **Vernon B\*,** Optimizing delivery properties of a waterborne, in situ-gelling embolic material, Society for Biomaterials Annual Meeting, San Antonio, TX (Apr 2009).

*Leon C*, ***Solis F***, **Vernon BL\***, Phase Behavior and Equilibration Kinetics of poly(N-Isopropylacrylamide-2-Hydroxyethyl Methacrylate), Materials Research Society Spring Meeting, San Fransisco, CA (Apr 2009).

Pinkus RL\*, Nathan DE, **Vernon BL**, Alpha Eta Mu Beta annual ethics session: What is professional ethics and why is it important?, Biomedical Engineering Society Annual Meeting, Pittsburg, PA (Oct 2009).

Nugent MT, McLaren AC, **Vernon B**, *McLemore R\**, The effect of poragens on elution and compressive strength of antibicrobial loaded bone cement, Orthopaedic Research Society Annual Meeting, New Orleans, LA (Mar 2010).

Miller RB, McLaren A\*, *Leon C*, **Vernon B**, *McLemore R*, The effect of surfactant on the elution of gentamicin from orthopaedic cement, Orthopaedic Research Society Annual Meeting, New Orleans, LA (Mar 2010).

***Kaul H***, Farag A, McLaren A, **Vernon B**, *McLemore R\**, Detection of aminoglycoside elution from orthopaedic cement through the use of buffered PBS solutions of differing pH, Orthopaedic Research Society Annual Meeting, New Orleans, LA (Mar 2010).

*Overstreet DJ*, *Dhruv HD*, **Vernon BL\***, Thermoreversible copolymers with enzyme-dependent lower critical solution temperatures, Society for Biomaterials 2010 Annual Meeting, Seattle, WA, (Apr. 2010).

*Riley C*, *McLemore R*, Preul MC, **Vernon BL\***, In situ gelling polymer system for vascular embolization: effect of radio-opaque agents on gelation, Society for Biomaterials 2010 Annual Meeting, Seattle, WA, (Apr. 2010).

*Bearat H*, **Vernon BL\***, Double-gelling hydrogels for endovascular embolization of aneurysms, Biomedical Engineering Society Annual Meeting, Austin, TX, (Oct. 2010).

Su F, Nandakumar V, Kelbauska L, Tian Y, Jin Yuguang, *Riley C*, **Vernon BL**, Johnson RH, ***Meldrum DR\****, Nanohybrid gel of polyethylene glycol and silica as a matrix for cell CT imaging, Pacifichem 2010, Honolulu, HI (Dec 2010).

*Riley C*, Bichard W, Preul MC, Vernon BL\*, A cross-linking polymer system for cerebral aneurysm embolization: formulation, characterization, and testing, Society for Biomaterials 2011 Annual Meeting, Orlando, FL, (Apr. 2011).

*Overstreet D*, McLemore R, **Vernon BL\***, Modular designed thermoreversible hydrogels with controlled swelling, Biomedical Engineering Society Annual Meeting, Hartford, CT, (Oct 2011).

Bearat H, Solis F, Bearat H, Seifert S, **Vernon B\***, Molecular structure and thermal characterization of thermosensitive polymers based on poly(N-isopropyl Acrylamide), 2011 Material Research Society Fall Meeting & Exhibit, Boston, MA, (Dec. 2011).

*Lee E*, *Overstreet D*, **Vernon BL\***, Temperature-responsive hydrogels with improved swelling and in situ crosslinking for aneurysm embolization, 2012 Material Research Society Spring Meeting & Exhibition, CA, (Mar. 2012).

*Heffernan JM*, Overstreet DJ, **Vernon BL**, Sirianni RW\*, Three Dimensional Hyaluronic Acid and Gelatin Hydrogels as an In Vitro Platform for Long-Term Monitoring of Glioblastoma Invasion, 2013 Biomedical Engineering Society Annual Meeting, (Oct. 2013).

*Heffernan JM*, Overstreet DJ, Srinivasan S, **Vernon B**, Sirianni R, Synthesis of a thermoreversible hydrogel for passaging adherent cells in three-dimensional culture, 2014 Biomedical Engineering Society Annual Meeting, San Antonio, TX, (Oct. 2014).

*Heffernan JM,* Overstreet DJ, *Srinivasan S,*  **Vernon BL**, Sirianni RW, Thermoreversible scaffolds improve transient three-dimensional culture by facilitating rapid cell recovery, Society for Biomaterials 2015 Annual Meeting, Charlotte, NC, (Apr. 2015).

*Pal A*, Pathak CP, **Vernon B**, Drug release from the biodegradable polymer grafted bioprosthetic tissue, Controlled Release Society 2016 Annual Meeting, Seattle, WA, (July 2016).

*Pal A, Nagaraju S*, **Vernon B,** ***Nikkhah M***, Utility of QK peptide in a novel injectable hydrogel in promoting vascularization within a 3D microenvironment, Society for Biomaterials 2017 Annual Meeting, Minneapolis, MI (Apr. 2017).

*Pal A*, Pathak C, Vernon B, Plasma based semisynthetic hydrogels as alternative to fibrin sealants, Biomedical Engineering Society Annual Meeting, Phoenix, AZ, (Oct 2017)

Bahda V, Moore R, McLaren A, Vernon B, Overstreet D, Characterization of antimicrobial susceptibility of bacterial biofilms on tissues, Biomedical Engineering Society Annual Meeting, Phoenix, AZ, (Oct 2017)

Heffernan J, McNamara J, Borwege S, Vernon B, Sanai N, Mehta S, Sirianni R, PNIPAAm-co-Jeffamine (PNJ) scaffolds as in vitro models for niche enrichment of glioblastoma stem-like cells, Biomedical Engineering Society Annual Meeting, Phoenix, AZ, (Oct 2017)

For all publications, ***bolded, italic names are Arizona State University Faculty and Staff contributors*** and*italic names are Arizona State University student and Postdoctoral contributors*.

\* indicates corresponding author

**Invited Lectures:**

Novel Biohybrid Artificial Pancreas, Swiss Institute of Technology (EPFL), Department of Chemical Engineering, Lausanne, Switzerland, (Nov 1998).

Novel Biohybrid Artificial Pancreas, Swiss Institute of Technology (ETHZ), Institute for Biomedical Engineering and Medical Informatics, Zurich, Switzerland, (Nov 1998).

In situ gelling biomaterials, University of Oklahoma, Department of Chemical Engineering, Norman, Oklahoma, (Feb 2000).

In situ gelling biomaterials, Arizona State University, Department of Chemical, Bio and Material Science Engineering, Tempe, Arizona, (April 2000).

In situ gelling biomaterials, Worcester Polytechnic Institute, Department of Bioengineering, Worcester, Massachusetts, (April 2000).

Application and design of in situ gelling biomaterials in drug delivery and tissue reconstruction, University of Texas El Paso, Department of Physics, El Paso, Texas (March 2003)

**In Situ-gelling Materials for Drug Delivery and Tissue Reconstruction**, University of Arizona, Department of Biomedical Engineering, Tucson, Arizona, (September 2003)

Application and design of in situ gelling biomaterials in drug delivery and tissue reconstruction, Utah State University, Department of Agricultural and Biological Engineering, Logan, Utah (Feb 2005)

Molecular Engineering of In Situ-forming biomaterials for vascular embolization, Tulane, Department of Bioengineering, New Orleans, Louisiana (June 2006)

In Situ-forming biomaterials for drug delivery and tissue reconstruction, South Dakota School of Mines and Technology, Rapid City, South Dakota (July 2006)

In situ-forming biomaterials for drug delivery and tissue reconstruction, Louisiana Tech University, Ruston, Louisiana (Aug 2006)

Application and design of in situ gelling biomaterials in drug delivery and tissue reconstruction, Brigham Young University, Provo, Utah (Sept 2006)

In situ-forming biomaterials for drug delivery and tissue reconstruction, University of Florida, Gainesville, Florida (Dec 2006)

The future of interventional biomaterials, Oklahoma State University, Stillwater, Oklahoma (Apr 2007)

Polymeric Materials: Bench Science to Clinical Applications in Orthopaedics, Banner Good Samaritan Hospital, Ortho Resident Research Day, Phoenix, Arizona (June 2008)

The future of interventional biomaterials, Louisiana Tech University, Ruston, Louisiana (Sept. 2008)

In situ-gelling materials for drug delivery and endovascular embolization, Barrows Neurological Institute, Phoenix, Arizona (May 2011)

In situ-gelling materials for drug delivery and endovascular embolization, Mayo Clinic Scottsdale, Scottsdale, Arizona (Feb 2013)

**Patents:**

Pat. # 7744912 (US), Pat.# AU32204A5 (Austrilia), # WO044808A1, “Biomaterials formed by nucleophilic addition reaction to conjugated unsaturated groups”, JA Hubbell, D Elbert, M Lutolf, A Pratt, R Schoenmakers, N Tirelli, B. Vernon. US1999060118093 US patent application.

Patent Pending, 10/215,635 “INJECTABLE BIOMATERIALS FOR DRUG DELIVERY”, B Vernon, US patent application 2002.

Patent Pending, “Localized Delivery System for Cancer Drugs, Phenstatin, Using N-Isopropylacrylamide”, B Vernon, S Powell, GR Pettit, US and World Patent application 2003.

Patent Pending 10/527,543; “Method for sterilization using in situ gelling materials”, B Vernon, KH Roy, US 2003 and World Patent application 2006.

Patent #:US 8048407 “*In situ* Gelling Self-Reactive Materials For Embolization”, B Vernon, M Birdno, M Preul, US and World Patent application 2005.

WO patent 2,013,056,170 , “In situ forming in soles”, B Vernon, R McLemore, V. Mikhael 2006.

WO patent 2,013,056,167 , “Water-stable non-ionic hydrogel and method using same/Copolymer”, B Vernon, D Overstreet, R McLemore, 2011.

Provisional Patent, “Water-stable non-ionic hydrogel and method using same/Terpolymer”, B Vernon, D Overstreet, R McLemore, A McLaren, 2011.

Patent #:US 10265439 “Injectable cell-laden biohybrid hydrogels for cardiac regeneration and”, M Nikkhah, B Vernon, 2019

Patent #: US 10780145 “Resorbable and in situ forming compositions for local drug delivery and methods of their use”, M Nikkhah, B Vernon,

Patent #: US 10,780,145 “In situ forming hydrogel and method using same”, D Overstreet, B Vernon, R McLemore, A McLaren, 2020.

**Other Publications:**

Vernon BL, A Novel Islet Polymer Matrix System, Ph.D. Dissertation, University of Utah, December, 1998.

**Funding:**

# ACTIVE

(PI: Vernon) 11/24/2018-06/21/2022

Dignity Health/ASU $250,000

Multi-institutional program to translate liquid embolics to the clinic

The primary goal of this project is to develop new enzyme degradable in situ gelling materials for endovascular embolization and to strengthen inter-institutional collaborations between ASU and BNI.

9R44AI142978-03A1 (PI: Overstreet, Co-I: Vernon) 08/01/2019-04/30/2021

NIH STTR $2,000,000

Sustained release gel enabling one-stage treatment of prosthetic joint infection

The goal of this project is to complete the preclinical development of a new sustained-release formulation of the antibiotics tobramycin and vancomycin for improved treatment of prosthetic joint infection.

2R42NS097069-02A1 (PI Tim Becker, Consultant: Vernon) 8/01/2019-7/31/2021

NIH STTR $1,400,000

Application of PPODA-QT for embolization of aneurysms

Optimize a hydrogel (PPODA-QT) for use as an endovascular liquid embolic for aneurysm treatment, and complete validation studies for FDA IDE approval.

NuShores (Primary: NIH SBIR) (Sub contract PI: Vernon) 10/15/2020-10/14/2021

Polyurethane synthesis: NuShores $101,404

The goal of this project is to establish manufacturing SOPs for polyurethane synthesis and to adjust degradation time for the PEG polyurethane.

**PENDING**

(PI: Overstreet; Co-I Vernon)

NIH 09/01/2022-08/30/2024

Sustained release gel for multi-day control of postoperative pain

The primary goal of this work is to develop an injectable drug delivery system for local pain control.

(PI: Song, co-I: Vernon, consultants: Lott, Nikkhah, Dovigi) $287,000

NIH 01/01/2021-12/30/2022

A novel 3D printing mechanism for tissue engineering applications

Develop a novel 3D printing mechanism for fabricating 3D porous structures with enhanced mechanical robustness, programmable biodegradability, and controlled drug release kinetics appropriate for dental applications.

(PI: Vernon) 07/01/2020-06/30/24

NIH $1,090,178

Structure-property study for enzyme dependent LCST materials

The primary goal of this project is to understand the structure-property relationships for novel temperature-responsive polymers with enzyme sensitive lower critical solution temperatures.

R44DE028213-02 (PI: Srivatsan) 08/01/2018-07/31/2021

NIH $1,700,000

Feasibility study of a nanostructural system for bone regeneration in preparation for dental implants

The major goal of this project is to demonstrate the ability of NuCress TM technology to support regeneration of mineralized tissues that recapitulate the mechanical, physical and biological properties of craniofacial bones and corresponding microenvironments, to facilitate improved dental implant success. Includes pending collaboration supplement.

**PAST**

1R41NS097069-01A1 (PI: Tim Becker, Consultant: Vernon, Ducruet, Preul)

NIH $215,536

Application of PPODA-QT for embolization of aneurysms

The primary goal is to finalize formulation of an in situ gelling material for embolization of cerebral aneurysms. This material is technology out of Vernon lab at Arizona State University.

1R44AR070685-01 (PI: Overstreet, Co-PI: Vernon) 07/01/2016-06/30/2018 10%

NIH $1,487,286

Sustained release gel enabling one-stage treatment of prosthetic joint infection

The primary goal of this project is to finalize formulation on a multi-drug delivery system for orthopedic application and conduct FDA enabling studies.

Mayo Clinic Scottsdale (PI: Vernon) 08/01/2015-05/30/2017

An Agitation pump to facilitate chemotherapy delivery $14,000

Pathak Holdings LLC (PI: Vernon) 07/01/2014-12/30/2016

Drug Delivery system development and research $20,000

1R41AR065917-01 (Vernon) 09/01/2014-06/30/2015 10%

NIH $150,000

Surface-covering gels for broad-spectrum antimicrobial protection following open

The primary goal of this research is to develop a hydrogel for broad-spectrum antimicrobial protection using silver nanoparticles in poly(N-isopropylacrylamide-co-Dimethyl gamma butyrolactone-co-Jeffamine).

1R41AR064080-01 (PI: Vernon) 09/01/2013 – 08/30/2014 10%

NIH $150,000

Antimicrobial-releasing gels for preventing infection in total joint arthroplasty

The primary goal of this project is to investigate the biocompatibility of using a new temperature sensitive, injectable, and degradable hydrogel for delivery of prophylactic antibiotics in total joint arthroplasty.

11GRNT7430029 (Vernon) 07/01/2011-06/30/2013 1.2 calendar months

American Heart Association $132,000

VEGF-loaded in situ gelling polymer system for brain aneurysm embolization

The goal of this project is to develop a PEG in situ gelling material that delivers growth factors to promote aneurysmal neck overgrowth.

Arizona Biomedical Research Commission 09/01/2010-08/30/2013 5%

PI: Alex McLaren of Bannerhealth Good Samaritan Hospital $360,000

(Vernon Co-I of Subcontract to ASU)

The major goal of this research is to develop in vivo wound models of orthopedic wounds to study drug release.

Midwestern University Dental School 05/01/09-06/30/2011 5%

PI: Brent Vernon $31,000

Research opportunities for 1st year Dental students in dental biomaterials.

Arizona Biomedical Research Commission 07/01/2007-06/30/2011 10%

PI: Brent Vernon $450,000

“Improved materials for endovascular embolization”

The major goal of this research is to develop simultaneously physically and chemically gelling materials to embolize aneurysms and arteriovenous malformations. The cytotoxicity and biocompatibility of these new materials will be tested in vitro and in vivo.

0755838Z 07/01/2007-06/30/2011 15%

American Heart Association $198,000

PI: Brent Vernon

“Optimizing in situ-gelling emulsions for arteriovenous malformation and aneurysm embolization”

The major goal of this research is to optimize the delivery of in situ-gelling reverse emulsion to embolize aneurysms and arteriovenous malformations.

1R01GM065911701A1 (PI: Vernon) 7/1/03-6/30/09 25%

NIH-NIGMS $1,141,965

Polymers with time-dependent properties for drug deliver

The major goals of this project are develop new in situ-forming materials with time-dependent lower critical solution for a bioresorbable, injectable drug delivery system.

MAYO CLINIC SCOTTSDALE 07/01/2006-06/30/2009 10%

PI: Brent Vernon $258,967

Transmucosal Delivery of Erythromycin to Treat Gastroparesis

The major goal of this research is to evaluate the effectiveness of treating Gastroparesis by delivery of erythromycin through the mucosal layer under the tongue. (Primary sponsor: Arizona Biomedical Research Commission.)

1 S10 RR019945-01(PI: Jung, Co-Inv: Vernon) 07/01/05-06/30/08

National Institutes of Health $1,309,550

“Bruker Biospin Stereoscopy/Imaging System”

This grant will support the purchase of a Bruker Biospin magnetic resonance imager for use in in-vivo studies of the effects of chemotherapy on tumors and to develop, test, and implement brain-imaging indicators for Alzheimer’s disease.

Depuy 12/01/2006-6/30/2008 5%

PI: Brent Vernon $48,000

Antibiotic release from PMMA bone cement.

The primary goal of this work is to better understand the inherent permeability of available bone cements and to better understand how various parameters (filler particle size and volume) may affect the baseline permeability and underlying morphology bone cement.

ASU Fulton School of Engineering 09/01/2006-08/30/2007 10%

PI: Brent Vernon $50,000

Cluster Seed funding for the Center for Interventional Biomaterials

The major goal of this grant is to establish the Center for Interventional Biomaterials.

GES0018 07/01/00-06/30/06

Whitaker Foundation $2,000,000

PI: Eric Guilbeau

Whitaker Foundation Program Development Award Extension and Continuation. (One of approximately 15 listed co-investigators as a member of the Harrington Department of Bioengineering)

GEU0000 07/01/00-06/30/06

Whitaker Foundation $3,744,580

PI: Eric Guilbeau

Neural & Molecular, Cell, and Tissue Bioengineering: A theme for the new department of bioengineering at ASU. (One of approximately 15 listed co-investigators as a member of the Harrington Department of Bioengineering)

GE5 1002 RS (PI: Vernon) 06/01/04-12/30/05 5%

Arizona Venture Technology Enterprises $42,000

The major goal of this project is to evaluate the reversibility of contraception using an intrafallopian tube gelling material.

GERP001 07/01/04-06/31/05 5%

Arizona State University Office for the Vice President of Research $10,000

PI: Brent Vernon

In vivo study of an in situ gelling material for arteriovenous malformation treatment.

The major goal of this project was to perform endovascular embolization on a porcine rete mirable model with a waterborne, in situ gelling reverse emulsion material.

CHE0131222 02/01/02-01/31/05 3%

NSF-Directorate for Mathematical & Physical Sciences $226,000/yr

PI: Daniel Brune

Purchase of a MALDI-TOF Mass Spectrometer

**YER-N054 01/01/04-12/30/04 5%**

Arizona State University Office of the Vice President for Research $18,000

PI: Rajeswari Sundararajan

Optimization of Electroporation Parameters for Human Ovarian Cancer Cells

GES0003 06/01/03-05/31/04 5%

Arizona State University Department of Bioengineering $20,000

PI: Brent Vernon

Controlled-Release of Macrophage Activating Factor (MAF) from in situ Gelling Material for Cancer Immunotherapy.

The major goal of this project is to investigate the release of Macrophage activating factor from in situ gelling materials. The long-term goal would be to use this as a cancer treatment by stimulating the immune system.

GES0006 06/01/03-05/31/04 5%

Mayo Clinic Scottsdale/Barrows Neurological Institute $20,000

PI: Brent Vernon

pH sensitive microspheres for oral vaccine delivery.

The major goal of this project is to develop a pH sensitive vaccine delivery system by combining alginate and poly(N-isopropylacrylamide-co-acrylic acid) to protect the vaccine in the stomach and provide release in the intestines.

GES0016 06/01/03-05/31/04 5%

Mayo Clinic Scottsdale $20,000

PI: Brent Vernon

In situ-gelling materials for arteriovenous malformation treatment.

The major goal of this project is to investigate the feasibility of using waterborne, phase segregated in situ cross-linking materials for arteriovenous malformation embolization.

YF99361 01/01/03-12/31/03 10%

Arizona State University Office of Collaborations and Technology Licensing $30,000

PI: Brent Vernon

Tubal Sterilization using self-reactive, in situ-gelling material

The major goal of this project is conduct intrafallopian tube embolization in rabbits to investigate the feasibility of using waterborne, phase segregated in situ cross-linking materials for permanent/semi-permanent contraception.

0160414Z 7/1/01-6/30/03 10%

American Heart Association $66,000

PI: Brent Vernon

Advanced Polymers for Endovascular Embolization

The major goals of this project are develop new materials for endovascular embolization using temperature sensitive polymers.

GET0019 01/01/02-12/31/02 5%

Arizona State University Department of Bioengineering Seed Grant $20,000

PI: Brent Vernon

Stem cell, osteoblast co-encapsulation for bone tissue engineering

The major goal of this project is to investigate the effects of co-encapsulating embryonic stem cells and osteoblasts on the stem cells, to develop a future bone regeneration system.

**Student Theses and Dissertations Advised:**

PhD Dissertations Awarded

Student: Evgenii Belykh, PhD (Co-advised with Dr. Mark Preul)

Dissertation Title: Visualization of Brain Tumors with Intraoperative Confocal Laser Endomicroscopy

Degree Date: Apr 2020

Student: John Heffernan, PhD (Co-mentored with Dr. Rachael Sirianni, BNI)

Dissertation Title: Engineering PNIPAAm biomaterial scaffolds to model microenvironmental regulation of glioblastoma stem-like cells

Degree Date: Dec 2017

Initial Position: Formulation Scientist, Sonoran Biosciences, Chandler, AZ

Student: Nikolay Martirosyan, PhD (Co-advised with Dr. Mark Preul, BNI).

Dissertation Title: Blood supply and vascular reactivity of the spinal cord under normal and pathological conditions.

Degree Date: 2016

Initial Position: Neurosurgery Resident, University of Arizona, Tucson, AZ

Student: Derek Overstreet, PhD

Dissertation Title: Temperature-responsive hydrogels with controlled water content and their development toward drug delivery and embolization applications

Degree Date: July 2012

Initial Position: Postdoc, Barrows Neurological Institute, Phoenix, AZ

Current Position: CTO, Sonoran Biosciences, Inc. Chandler, AZ

Student: Hanin Bearat, PhD

Dissertation Title: A simultaneous physically and chemically gelling polymer system for endovascular embolization of cerebral aneurysms

Degree Date: May 2012

Initial Position: Postdoc, Duke University, Raleigh, NC

Current Position: Sr. Quality Engineer, Medtronic, Phoenix, AZ

Student: Celeste Riley, PhD

Dissertation Title: A cross-linking polymer system for cerebral aneurysm embolization: formulation, characterization, and testing.

Degree Date: August 2011

Initial Position: Postdoc, Arizona State University

Current Position: Director of the Science Writing support service, University of Muenster, Munster, Germany

Student: Zhanwu Cui, PhD

Dissertation Title: Development of NIPAAm-based thermosensitive, injectable and biodegradable copolymers for controlled-release of anti-cancer drug.

Degree Date: Aug 2009

Initial Position: Postdoc, University of Connecticut Health Center

Student: Ryan McLemore, PhD

Dissertation Title: In situ-gelling materials for intralumen embolization

Degree Date: May 2007

Initial Position: Postdoc, Department of Bioengineering, University of California Berkeley

Recent Position: Research Scientist, Good Samaritan Hospital Orthopedic Residency Program

Master Theses Awarded

Student: Jacob Nickle, MS

Thesis Title: A Design of Experiment Analysis of Log-Normal Microsphere Distribution Modeling Drug Delivery

Degree Date: May 2021

Initial Position:

Student: Rex Moore, MS

Thesis Title: Microparticle formulation optimization

Degree Date: May 2020

Initial Position: Medical School

Student: Karima Rosas, MS

Thesis Title: Enzyme-sensitive LCST polymers

Degree Date: May 2019

Initial Position: Technician, Humabiologics

Student: Vajra Badha, MS

Thesis Title: Characterization of antimicrobial susceptibility of bacterial biofilms on biological tissues.

Degree Date: May 2017

Initial Position: Scientist, Sonoran Biosciences

Student: Christine Leon, MS

Thesis Title: Optimization of antibiotic loaded acrylic bone cement

Degree Date: May 2010

Initial Position: Bioengineering PhD student, University of Berkeley

Student: Sarah Salameh, MS

Thesis Title: Transmucosal delivery of erythromycin for gastroparesis,

Degree Date: Aug 2008

Current Position: Catalyst Biosciences, San Francisco CA

Student: Stephanie Robb, MS

Thesis Title: Simultaneous Chemical and Physical Cross-linking Biomaterials

Degree Date: May 2007

Initial Position: Abbott Labs, Temecula CA

Current Position: Abbott Labs, Temecula CA

Student: Eric Henderson, MS,

Thesis Title: In vivo biocompatibility of time-dependent lower critical solution materials

Degree Date: May 2006

Initial Position: Boston Scientific, MN

Student: Eun Jeong Kim, MS

Thesis Title: Phenstatin Delivery System

Degree Date: May 2005

Initial Position: Graduate Student, UofA

Student: Frank Fusaro, MS

Thesis Title: Progesterone release from an in situ-gelling material to be used as a tubal sterilization device

Degree Date: May 2003

Initial Position: Hackensack University Medical Ctr., Hackensack NJ

Current Graduate Students Advised

Jeff Blanzy, PhD Candidate, Dual gelling liquid embolic, 2018-Present

Priscilla Han, MS Student, In situ gel for virus delivery, 2021-Present

Research Scientist Advisees

Bae Hoon Lee, Ph.D., 2003-2006 (Postdoc) 2006-2008 (Assistant Research Scientist)

Ryan McLemore, Ph.D., 2008-2010 (Postdoc)

Harshil Dhruv, Ph.D., Research Associate 2008-2009 (Postdoc)

Celeste Brennecka, Ph.D., Research Associate 2011-2013 (Postdoc)

Derek Overstreet, Ph.D., Research Scientist 2013-2014

Amrita Pal, Ph.D., Research Associate, 2015-Present (Postdoc)

Undergraduate Projects Supervised

Mike Pfister, Honors Thesis and Senior Design, DSC of polymers with time-dependent LCST, 2000-2002

Heather Francis, Independent Research, Degradation of waterborne, in situ-gelling materials from phase segregated precursors, 2000-2001

Steven Powell, Senior Design and Independent Research, Design of Temperature-responsive polymer drug conjugate, 2001-2002.

Timothy Curd, Senior Design and Independent Research, Design of an in vitro aneurysm model (2001-2002) and pH sensitive oral vaccine delivery systems (2002-2003)

Aaron Cremona, Independent Research, Temperature sensitive prodrugs of Phenstatin, 2002

Aaron Conovaloff, Independent Research, 2003

Regis Flaherty, Senior Design, Lower back sleep aid, 2003-2004

Eric Miller, Senior Design, Improved Knee Brace, 2003-2004

Rachael Weiss-Malik, Senior Design and Independent Research, 2003-2004

Merrill Birdno, Senior Design and Independent Research, In situ gelling materials for AVM embolization, 2003-2004

Brad Borden, Senior Design and Independent Research, Concentric delivery device for in situ gelling material, 2003-2004

Leah Small, Senior Design and Honors Thesis, Biodegradable injectable in situ gelling materials for MAF delivery, 2003-2004

Leyla Valenzuela, Senior Design, Arteriovascular model, 2004-2005

Jonathan Larance, Senior Design, Arteriovascular model, 2004-2005

Emily S , Senior Design, Arteriovascular model, 2004-2005

Megan Snyder, Senior Design, Arteriovascular model, 2004-2005

Terese Robb, Senior Design, Fallopian Tube Delivery catheter, 2003-2004

Jared Niska, Senior Design and Honors Thesis, Brain tumor drug delivery material, 2003-2004

Alex Letham, Senior Design, Improved Eye wash, 2003-2004

Heather Levene, Senior Design, Improved sensitivity exam gloves, 2003-2004

Bianca Wheeler/West, MARC/FURI Research, Simultaneous physically and chemically cross-linking materials, 2003-2005

Lauren Testa, Senior Design, Anti-inflammatory wound covering, 2004-2005

Christine Esposito/Deaton, Senior Design, Fallopian tube anchor, 2004-2005

Mary Wilcox, Senior Design and Honors Thesis, Enzymatically degradable bone screw, 2004-2005

Charles McCartney, Senior Design, Bioreactor system to test degradable bone screw degradation, 2004-2005

Travis Howell, Senior Design, High pressure catheter for delivery of materials with time-dependent viscosity, 2004-2005

Andreas Gonzales, Senior Design, High pressure catheter for delivery of materials with time-dependent viscosity, 2004-2005

Sara Call, Senior Design, High pressure catheter for delivery of materials with time-dependent viscosity, 2004-2005

Jackie Sun, FURI Research and Honors Thesis, Protein delivery from enzymatically degradable hydrogels, 2004-2006

Art Abram FURI Research, Characterization of polyethylene glycol diacrylate gelation with pentaerythritol tetrakis 3’-mercaptoprioponate, 2004-2005

Vivian Wassef, FURI Research, Time-dependence of gelation on mixing for reverse emulsion gels, 2005-2006

Richard Dault, FURI Research, Degradation of poly(NIPAAm-co-butyrolactone), 2005-2006

Michael Cucharia, FURI Research, Enzymatically sensitive LCST polymers synthesis and characterization, 2005-2006

Hanin Bearat, FURI Research, Honors Thesis and Senior Design, Dexamethasone delivery for arthritis, 2005-2007

Himanshu Kaul, FURI Research, Characterization and modeling of polypropylene glycol diacrylate gelation with pentaerythritol tetrakis 3’-mercaptoprioponate, 2004-2005, Research Technician, 2007-Present.

Sonja Seif-Naraghi, FURI Research, Isolating RNA from poly-L-lysine encapsulated cells, 2006

Vicki Cheng, FURI Research, Synthesis of novel simultaneous physical and chemical cross-linking polymers, 2005-2007. Senior Design, Laboratory Technician, 2007-2008.

Jorge Valdez, FURI Research, Polyphosphagene chemistry for in situ gelling materials, 2006-2010.

Noel Pense, FURI Research, Catheter delivery of simultaneous chemical and physical cross-linking polymers, 2006.

Sarah Leung, Senior Design, In sole design, 2006-2007

Amy Teegarden, Senior Design and Honors Thesis, Bone Marrow Properties, 2006-2008

Ryan Ekre, Senior Design, Pulsatile vaccine delivery, 2006-2007

Siddharth Sharma, Senior Design and Honors Thesis, Disc biomechanics and patch, 2006-2007

Brian Boyle, Honors Thesis, Tissue cross-linking, 2006-2007

Bobby Jafari, Senior Design, Testosterone delivery, 2006-2007

Kevin Jafari, Senior Design, Testosterone delivery, 2006-2007

Chad Green, Senior Design, Low-Shrinkage Flowable Dental Composite, 2007-2008

Philbert Huskon, Antibiotic release from bone cement, 2007-2008

Christine Leon, FURI Research, Honors Thesis, Phase Diagrams of Poly(N-isopropylacrylamide-co-Hydroxy ethyl methacrylate acrylate), 2007-2010.

Brandon Blakley, FURI Research, Honors Thesis, Synthesis of poly(propylene glycol) divinyl sulfone, 2007-2010.

Kelly Layton, Senior Design, Honors Thesis, Optimizing in situ gelling emulsions for AVM embolization, 2007-2008

Jose Luis, WAESO research assistant, Antibiotic release from bone cement emulsions, 2008-2009

Robert Espinoza, Senior Design, Bone cement mixer for emulsion compounds, 2008-2009

Robert Anderson, Senior Design, Chemical Antiseptic Depilatory Swab, 2008-2009

David Eaton, FURI Research, Screening new emulsion embolization materials, 2008-2012

Amye Farag, FURI Research, Enzyme sensitive poly(NIPAAm) characterization, 2009-2013

Francis Calara, FURI Research, Antibiotic release from orthopedic cement, 2009-2011

Kristin Soodak, FURI Research, Degradation of In situ gelling materials for aneurysm treatment, 2010-2013

Emily Fuller, Independent Research, Kinetics of in situ gelling materials for aneurysm treatment, 2010

Richard Huynh, FURI Research, Drug release kinetics from Poly(NIPAAm-co-Jeffamine), 2010-2012

Elizabeth Lee, FURI Research, Poly(NIPAAm-co-Jeffamine) polymers for aneurysm embolization, 2010-2013

Andrea Kipe, FURI Research, Injectable biomaterials from blood and plasma, 2011

Paulo Casteneda, FURI Research, Pore size effects on diffusion in bone cement, 2011- 2013

Madison Klug, Research Assistant, Synthetic polymer cross-linking of cornea tissue, 2011-2012

Summar Klug, Research Assistant, Synthetic polymer cross-linking of culture tissue, 2011-2012

Sarah Hall, Research Assistant, Paclitaxal release from Poly(NIPAAm-co-Jeffamine) polymers, 2011

Zoran Bundalo, Research Assistant, Methylcellulose delivery system, 2011- 2013

Paul Juneau, FURI Research, Research Assistant Cardiac stem cell scaffold development, 2012-2014

Michael Rose, Capstone Design, Catheter delivery system for temperature responsive polymers, 2012-2013

David Callahan, Capstone Design, Research Assistant, Polymer cross-linking of tissues, 2013-2014

Casey Rockwood, Capstone Design, Research Assistant, Polymer cross-linking of tissues, 2013-2014.

Long Le, FURI Research, Matlab processing of cell migration assay images, 2013-2014.

Luis Laitano, FURI Research, 3-D scaffolds for glioblastoma migration, 2013-2014.

Sanjay Srinivasan, Research Assistant, Cell Scaffold for studying glioblastoma migration, 2013-2015.

Serena Kaplan, FURI Research, Tattooing controlled release systems, 2014-2016.

Paige Stokes, FURI Research, Reverse emulsions for antibiotic release, 2014-2015.

Gamuchirai Tavaziva, Laboratory Assistant, Biofilm susceptibility to injectable drug delivery released antibiotics, 2014-2015.

Daniel Gentry, Research Assistant, Injectable biomaterial for orthopedic infection treatment, 2015-2017.

Spencer Gossel, Research Assistant, In situ crosslinking materials for norepinephrine delivery, 2016-2017.

Avery Witting, Research Assistant, Self Stirring syringe for infusion of chemotherapy, 2015-2017.

Pete Akerele-Ale, Capstone Design, Clotting foam for battlefield trauma, 2016-2017

Justin Dombrowski, Capstone Design, Clotting foam for battlefield trauma, 2016-2017.

Levi Riley, Laboratory assistant/FURI Research/Capstone design, Injectable drug delivery systems for metabolism control, 2016-2019

Michael Nguyen, FURI Research, Injectable biomaterial for orthopedic infection treatment, 2016-2018

Rex Moore, FURI Research, Injectable biomaterial for orthopedic infection treatment, 2016-2019

Helena Nebaty, FURI Research, Math model of magnetic field in a self-stirring syringe, 2016-2017

Kolby Black, Undergraduate Research, Time dependent buffer, 2017-2018

Mahoro Uwiringiyimanal, FURI Research, Enzyme sensitive LCST polymers, 2017-2018

Tori Johnson, FURI Research, Research Assistant, Reverse emulsion polymers with surfactants for embolization, 2017-2019

Karolena Lein, FURI Research, Enzyme sensitive LCST polymers for drug delivery, 2017-2020

Kyle Durrant, <co-mentor> Capstone Design, Transcatheter Vessel Occluder, 2018-2019

Kyle Hull, <co-mentor> Capstone Design, Transcatheter Vessel Occluder, 2018-2019

Devin Lillegaard, <co-mentor> Capstone Design, Transcatheter Vessel Occluder, 2018-2019

Patrick Panattoni, <co-mentor> Capstone Design, Transcatheter Vessel Occluder, 2018-2019

Nicholas Whitley, <co-mentor> Capstone Design, Transcatheter Vessel Occluder, 2018-2019

Byron Alarcon, Capstone design, Injectable drug delivery systems for metabolism control, 2018-2020

Nate Gross, FURI Research, Microsphere drug delivery, 2018-2019

Nathan Hui, FURI Research, Orthopedic infection drug delivery platform internship, 2019-2020

Jinpyo Seo, FURI Research, Microparticle formulation DOE, 2019-2021

Michelle Loui, FURI Research, Dual cross-linking polymers for vascular embolization, 2019-2020

Kasandra Sanchez, WAESO Research, Temperature-responsive polymers for embolization, 2019-2021

Smita Gopalakrishnan, Capstone Design, DrugSlug, 2019-2020

Esther Sim, Capstone Design, DrugSlug, 2019-2020

Emily Tanner, Capstone Design, DrugSlug, 2019-2020

Mohammed Tamim, Capstone Design, Dental implant cleaner, 2019-2020

Ashwin Limaye, Capstone Design, Dental Implant Cleaner, 2019-2020

Abdulmonem Alshammari, Capstone Design, Dental Implant Cleaner, 2019-2020

Ahmed Al-Sultani, Capstone Design, Dental Implant Cleaner, 2019-2020

Salma Leyasi, Capstone Design, Anti-reflux catheter for embolization, 2019-2020

Margaret Miller, Capstone Design, Anti-reflux catheter for embolization, 2019-2020

Edgar Manriquez-Sandoval, Capstone Design, Anti-reflux catheter for embolization, 2019-2020

Samuel Rios, Capstone Design, Anti-reflux catheter for embolization, 2019-2020

Breanna Isbell, Capstone Design, Bio-indicative wound dressing, 2019-2020

Alexandra Davis, Capstone Design, Bio-indicative wound dressing, 2019-2020

Matthew Peters, Capstone Design, Bio-indicative wound dressing, 2019-2020

Priscilla Han, FURI, Statistical modeling of surface degradation drug release, 2019-2021

Anthony Silva, Undergraduate Research, Microparticle fabrication and drug release, 2020-2021

Kaitlyn Janssen, Undergraduate Research, Drug release from poly disperse microparticles, 2020-2021

Quincy Lyons, Undergraduate Research, Microparticle fabrication and drug release, 2020-Present

Alicia Salas, Undergraduate Research, Biodegradable Polyurethane characterization, 2020-2021

Fernando Aguilera, Capstone, Hydrogel dressing for targeted antibiotic delivery, 2020-2021

Raneem Asiri, Capstone, Hydrogel dressing for targeted antibiotic delivery, 2020-2021

David Asuncion, Capstone, Hydrogel dressing for targeted antibiotic delivery, 2020-2021

Beerjas Bath, Capstone, Hydrogel dressing for targeted antibiotic delivery, 2020-2021

Alexa Ng, Capstone, Anastomotic Solutions, 2020-2021

Adrienne Parkinson, Capstone, Anastomotic Solutions, 2020-2021

Natalie Santoro, Capstone, Anastomotic Solutions, 2020-2021

Jeremy Atkinson, Capstone, Unique hand digit prosthetic joint spacer, 2020-2021

Cesar Carreto, Capstone, Unique hand digit prosthetic joint spacer, 2020-2021

Vishnu Karthigeyan, Capstone, Unique hand digit prosthetic joint spacer, 2020-2021

Maren Eltze, Capstone, Development of a microneedle drug delivery system, 2020-2021

Rachel Fisher, Capstone, Development of a microneedle drug delivery system, 2020-Present

Anshul Krishnan, Capstone, Development of a microneedle drug delivery system, 2020-2021

Gabriel Zdrale, SURI Research, Degradable Polyurethane synthesis process development, 2020-Present

Anthony Silva, FURI Research, Polyurethane synthesis and characterization, 2020-Present

Rachel Millard, Capstone, Localized oxygen delivery system for wound healing, 2021-Present

Maddie Rogers, Capstone, Localized oxygen delivery system for wound healing, 2021- Present

Madilyn Bray, Capstone, Spiritus: improving tracheostomy stability and recover, 2021-Present

Alyssa Kritz, Capstone, Spiritus: improving tracheostomy stability and recover, 2021-Present

Taylor Pennington, Capstone, Spiritus: improving tracheostomy stability and recover, 2021-Present

Gabriel De La Rocha, Capstone, Spiritus: improving tracheostomy stability and recover, 2021-Present

**Master Student Applied Projects**

Rachel Juetten, MS Student, Anti-Fatigue Mat Cleanroom integration at the tech group phoenix, 2015-2016

Christopher Glass, MS student, Minimum biofilm eradication concentration study, 2014-2015

Michelle Loui, MS Student, Polyurethane synthesis and characterization, 2020-Present

Karolena Lein, MS Student, Modeling drug release from microparticles with bimodal distributions, 2020-2021

Christine Phoung Tran, MS Student, In vitro Bactericidal Efficiacy of different antibacterial irrigations against high resistant human skin micro-organisms, 2021

Ethan Blank, MW Applied Project Candidate, Self-expanding gel for blood clotting, 2020

Swaprakash Yogeshwaran, MW Applied Project Candidate, Microparticle release DOE, 2020

**Professional and Scientific Service:**

Scientific and Professional Society Memberships

Alpha Eta Mu Beta – National President 2008-2010, National Past-President 2011-2013

Biomedical Engineering Society

Society for Biomaterials

Controlled Release Society

American Chemical Society

Materials Research Society

ASTM International

Professional Society Service

ICM/IEEE Annual Meeting Financial Chair 2009

Journal Referee Service

Biotechnology and Bioengineering

Tissue Engineering

Biomacromolecules

Biomedical Materials

Polymer

Polymer International

Annals of Biomedical Engineering

Angewandte Chemie

Langmuir

Macromolecules

Journal of Physical Chemistry

Journal of Controlled Release

Anatomical Record

Advanced Materials

Biomaterials

Chemistry of Materials

Soft Matter

Acta Biomaterialia

Chemical Society Reviews

Science and Technology of Advanced Materials

Drug Development and Industrial Pharmacy

International Journal of Biological Macromolecules

Journal of Materials Chemisty B

Proposal Reviewer Service

NIH ZRG1 BST R(02), review panel (adhoc), 2019

NIH ZRG1 BST R(10), review panel (adhoc), Mar 2018, Nov 2018

NIH MOSS V(02), review panel (adhoc), 2018

NIH ZRG1 BST R, review panel (adhoc), 2017

NIH BMBI, review panel (adhoc), 2017

NIH ZRG1 MOSS-Q, review panel, 2017

NIH ZRG1 BST-F, review panel, 2017

NIH, BST-10, review panel (adhoc), 2016

NIH, MTE, review panel (adhoc), 2016

Biomedical Research Foundation (LA), Seed Funding proposal review 2016

NIH, ZDE-1 VH(17), review panel (adhoc), 2015

NIH, AARR-K (43), Review panel (adhoc), 2015

NIH, BST-10, Review Panel (adhoc), 2014-2015

NIH, CEBRA, Review panel (adhoc), 2014

NIH, ZRG1 IMST-D (13) B (SBIR applications) review panel (ad hoc), 2009-2013

National Institutes of health, BMBI review panel (ad hoc); 2008-2014

NIH, IMST29 (student fellowships) review panel (ad hoc), 2010

NIH, ZRG1 AARR-D (40) P review panel (ad hoc), 2010

Texas, NHARP grant program, 2009- 2010

NIH, Special emphasis panel for R13 grants (ZEB1 OSR-C) (ad hoc); 2004-2007

Army Research Office, 2007 Chemical and Biological Defense Basic Research Program; 2006

**Arizona State University Committee Service:**

University

Academic Senate’s Curriculum & Academic Programs Committee (CAPC/TCCS) 2007-2011

Faculty Senate 2005-2008

Institutional Use and Care of Animals Committee (IUCAC) 2005-Present, Associate Chair (2007- Present), Chair (Fall 2012)

Sci-Quest Chemical Inventory Focus Group 2003-2005

Research and Creative Activities Committee 2013-2018

Research Incident Response Team 2009-Present

College

College Curriculum Committee 2019-Present

Dean’s Executive Committee 2016-2018

Academic Integrity Committee 2012-2015

Member of the College Standards Committee 2007-2012

Chair of the Bioimaging Search Super committee 2006-2007

Chemical Inventory Lab Implementation Team 2003-2005

Member of the Diversity Committee 2001-2003

Member of the Board of Directors for the College Alumni Association 2000-2005

Department

Undergraduate Curriculum Committee Chair, 2019-Present

Medical Device Design Search Committee member, 2016-2017

Personnel Committee 2011

Graduate Program Chair 2009-2012

Graduate Program Director 2006-2009

Bio-imaging Search Committee Chair 2007-2008

Member of the Graduate Committee 2003-2012

Chair of the Diversity Committee 2002-2006

Chair of the Neural Engineering/Tissue engineering Faculty Search Committee 2005-2006

**Principal Areas of Teaching and Research:**

Teaching: \*Introduction to Bioengineering -BME201

\*Introduction to Molecular, Cellular and Tissue Engineering -BME598/BME494

\*Polymeric Drug Delivery -BME598/BME494

\*Introduction to Biomaterials -BME318

\*Advanced Biomaterials -BME518

\*Principles of Conservation in Bioengineering -BME200 (BME211/212)

\*Bioengineering Transport Applications -BME434

\*The ASU Experience -ASU101

\*Matlab/Mathcad for BME – BME211

\*Integrate Learning Lab BME598/BUS594

Teaching Evaluations:

Fall 2002 BME 494/598 (MCTE) 4.68/5 26 students

Spring 2003 BME 318 (Biomaterials) 4.1/5 89 students

Fall 2003 BME 494/598 (MCTE) 4.8/5 28 students

Spring 2004 BME 318 4.6/5 89 students

Fall 2004 BME 494 (Intro to MCTE ) 4.55/5 20 students

Fall 2004 BME 598 (MCTE) 4.58/5 20 students

Spring 2005 BME 518 (Advanced Biomaterials) 5/5 2 students

Spring 2005 BME 318 (Biomaterials) 4.53/5 68 students

Fall 2005 BME 598 (Polymeric Drug Delivery) 4.49/5 18 students

Fall 2005 BME 494 (Polymeric Drug Delivery) 4.91/5 18 students

Spring 2006 BME 318 4.66/5 62 students

Fall 2006 BME 494 (Introduction to Molecular, 4.94/5 15 students

Cellular and Tissue Engineering)

Fall 2006 BME 598 (Molecular, Cellular, and 4.84/5 11 students

Tissue Engineering)

Spring 2007 BME 494 (Bioengineering Materials) 4.86/5 4 students

Fall 2007 BME 598 (Polymeric Drug Delivery) 4.56/5 6 students

Fall 2007 BME 494 (Polymeric Drug Delivery) NA 16 students

Fall 2007 BME 598 (Scientific Communication) 3.87/5 18 students

Fall 2007 ASU 101 NA 19 students

Spring 2008 BME 494 (Tissue Engineering) 4.77/5 18 students

Spring 2008 BME 598 (Tissue Engineering) 4.75/5 9 students

Fall 2008 BME 200 (Conservation Principles) 4.54/5 17 students

Spring 2009 BME 494 (Polymeric Drug Delivery) 4.26/5 15 students

Spring 2009 BME 598 (Polymeric Drug Delivery) 4.32/5 9 students

Fall 2009 ASU 101 4.37/5 18 students

Fall 2009 BME 434 (Bioengineering 4.37/5 12 students

Transport Applications)

Spring 2010 BME 200 4.43/5 57 students

Fall 2010 BME 434 4.52/5 27 students

Spring 2011 BME 200 4.01/5 63 students

Fall 2011 BME 211 (Matlab/Mathcad) 4.69/5 57 students

Fall 2011 BME 212 (Conservation) 4.72/5 56 students

Spring 2012 BME 211 4.53/5 72 students

Spring 2012 BME 211 4.47/5 38 students

Spring 2012 BME 212 4.23/5 71 students

Spring 2012 BME 212 4.67/5 43 students

Fall 2012 BME 211 4.7/5 35 students

Fall 2012 BME 212 4.41/5 33 students

Summer 2013 BME 200 6 students

Fall 2013 BME 200 4.46/5 26 students

Spring 2014 BME 200 (Honors Section) 4.8/5 22 students

Summer 2014 BME 200 4.33/5 18 students

Fall 2014 BME 494 (Polymeric Drug Delivery) 4.67/5 6 students

Fall 2014 BME 598 (Polymeric Drug Delivery) 4.49/5 19 students

Fall 2014 ASU 101 4.74/5 18 students

Fall 2014 BME 200 4.52/5 63 students

Spring 2015 BME 200 (Honors Section) 4.11/5 21 students

Spring 2015 BME 200 3.81/5 79 students

Summer 2015 BME 200 4.27/5 14 students

Fall 2015 BME 200 4.42/5 46 students

Fall 2015 ASU 101 4.92/5 19 students

Spring 2016 BME 200 4.65/5 68 students

Summer 2016 BME 200 4.93/5 9 students

Fall 2016 ASU 101 4.81/5 19 students

Fall 2016 BME 200 4.88/5 13 students

Spring 2017 BME 200 4.62/5 69 students

Summer 2017 BME 200 4.94/5 11 students

Fall 2017 BUS 594/

BME 598 (Integrate Fusion Learning Lab) 5/5 3 students

Fall 2017 BME 200 4.61/5 22 students

Fall 2017 BME 200 (Honors Section) 4.86/5 13 students

Fall 2017 ASU 101 4.49/5 18 students

Spring 2018 BME 200 4.86/5 37 students

Summer 2018 BME 200 4.78/5 8 students

Fall 2018 ASU 101 4.9/5 20 students

Fall 2018 BUS 594/

BME 598 (Integrated Fusion …) 4.67/5 16 students

Fall 2019 BME 382 4.79/5 26 students

Fall 2019 BME 598 (Polymeric Drug Delivery) 5/5 17 students

Summer 2019 BME 200 4.61/5 7 students

Spring 2019 BME 382 4.77/5 41 students

Spring 2019 BME 200 (Honors Section) 4.84/5 23 students

Spring 2019 BME 200 4.78/5 78 students

Research: \*Smart LCST materials for drug delivery and tissue engineering.

\*Localized delivery of cancer therapeutics.

\*Simultaneous chemical and physical cross-linking materials.

\**In situ*-gelling materials for intra-tubal embolization (contraception).

\*Advanced polymers for endovascular embolization.

\*Theoretical modeling of polymer phase behavior.

\*Antibiotic releasing bone cement.

\*Chemo-drug delivery for liver cancer.

\*Microparticle formulation and polydispersity