

JESSICA D. SCHIFFMAN, PH.D.

Gary R. Lapidus Professor
Professor of Chemical Engineering
University of Massachusetts Amherst
N533 Life Sciences Laboratories, 240 Thatcher Road, Amherst, MA 01003-9364

PROFESSIONAL APPOINTMENTS

2022-present **Professor**, Department of Chemical Engineering, University of Massachusetts Amherst, Amherst, MA

2022-present **Graduate Program Faculty**, Materials Science & Engineering Graduate Program, University of Massachusetts Amherst, Amherst, MA

10/2021-5/2022 **Interim Department Head**, Department of Chemical Engineering, University of Massachusetts Amherst, Amherst, MA

9/2021-10/2021 **Acting Department Head**, Department of Chemical Engineering, University of Massachusetts Amherst, Amherst, MA

2021-present **Graduate Program Faculty**, Molecular and Cell Biology Graduate Program, University of Massachusetts Amherst, Amherst, MA

1/2021-9/2021 **Associate Department Head**, Department of Chemical Engineering, University of Massachusetts Amherst, Amherst, MA

5/2020-12/2020 **Interim Associate Department Head**, Department of Chemical Engineering, University of Massachusetts Amherst, Amherst, MA

2017-2022 **Associate Professor**, Department of Chemical Engineering, University of Massachusetts Amherst, Amherst, MA

2011-2017 **Assistant Professor**, Department of Chemical Engineering, University of Massachusetts, Amherst, Amherst, MA

2009-2011 **Postdoctoral Associate**, Department of Chemical and Environmental Engineering, Yale University, New Haven, CT

2004-2005 **Engineer**, Division of Research and Development, Stryker Orthopedics, Mahwah, NJ

EDUCATION

2005-2009 PhD, Materials Science and Engineering, Drexel University, Philadelphia, PA
Dissertation: "Determination of the electrospinning parameters for biopolyelectrolytes and their modifications" Advisor: Prof. Caroline L. Schauer

2003-2004 MEng, Materials Science and Engineering, Cornell University, Ithaca, NY
Thesis: "Biodegradation of chitosan films, electrospun polylactic acid mesh, and chitosan films reinforced with electrospun polylactic acid mesh"
Advisor: Prof. Margaret W. Frey (Department of Fiber Science)

1999-2003 BS, Ceramic and Materials Engineering, Rutgers University, New Brunswick, NJ
Thesis: "Predictive process control, linear optimization, and particle packing of alumina"
Advisor: Prof. Richard Haber

AWARDS AND HONORS

2022-present Gary R. Lapidus Faculty Fellow

2022-present Deputy Editor, *ACS Applied Engineering Materials*

2022 UMass Distinguished Graduate Mentor Award

2022 UMass ADVANCE Faculty Mentor Award

2022-2024 Editorial Advisory Board Member, *ACS Applied Materials & Interfaces*

2021 *Biomaterials Science* Emerging Investigator

2021 *Industrial & Engineering Chemistry Research* Class of Influential Researchers

2020 Outstanding Teaching Award

2019 *ACS Applied Materials & Interfaces* Young Investigator Award

2019-2021 NSF ADVANCE Collaboration & Equity Faculty Fellow

2017 Barbara & Joseph Goldstein Outstanding Junior Faculty Award

2016 Women in Science You Should Be Following on Social Media, Sci Chic

2014-2020 Professor James M. Douglas Career Development Faculty Fellow

| | |
|-----------|---|
| 2013 | NSF Early Career BRIGE Award |
| 2013 | Invited Member, US-China Workshop on Solar Energy and Environment |
| 2009 | Doctoral Award, Drexel University |
| 2008-2009 | Koerner Family Fellow |
| 2008 | NSF/AAAS International Science & Engineering Visualization Challenge: Honorable Mention, published in <i>Science</i> , <i>Nature</i> , <i>Illustreret Videnskab</i> , <i>Focus Italy</i> , <i>National Geographic News</i> , <i>Weekly Reader</i> , <i>Forskning & Framsteg</i> |
| 2008 | Finalist, Fall MRS Science as Art Competition |
| 2008 | NSF Lindau Fellow, 58 th meeting of Nobel Laureates (physics), Lindau, Germany |
| 2007-2008 | Best of the MatPac, Best graduate research in Materials Science in Pennsylvania |
| 2007 | Outstanding Teaching Assistant Award (Drexel University) |
| 2006-2009 | Graduate Assistantship in Areas of National Need (GAANN) Fellow |
| 2005-2009 | Dean's Fellow |
| 2005-2006 | NSF Integrative Graduate Education and Research Traineeship (IGERT) Fellow |
| 2002-2003 | Malcolm G. McLaren Scholarship Recipient |

PEER-REVIEWED PUBLICATIONS

[ORCID](#) 0000-0002-1265-5392 | [Google Scholar](#) | As of Sept 2023: Total citations = 8822 & h-index = 37

Trainees are underlined, † are authors that contributed equally, and * designates the corresponding author.

86. Rathore, P. & **Schiffman, J.D.*** "Effect of pH value on the electrical properties of PEDOT:PSS-based fiber mats" *Under Review*
85. Barajas, B., Kurtz, I.S., Waldman, A.J.^{UG}, **Schiffman, J.D.*** "Stiffness and oligomer content affect the initial adhesion of staphylococcus aureus to polydimethylsiloxane gels" *Under Review*
84. Hancock, S.N., Yuntawattana, N.[†], Diep, E.[†], Maity, A., Tran, A., **Schiffman, J.D.***, Michaudela, Q.* "Ring-opening metathesis polymerization of *N*-methyl pyridinium-fused norbornenes to access antibacterial main-chain cationic polymers" *Under Review*
83. Rehmann, K.M., Klier, J., **Schiffman, J.D.*** (2023) "Anionic polymerization and transport of diethyl methylidene malonate on polyolefin copolymer surfaces" *Advanced Article*. DOI: 10.1039/D3PY00506B
82. Sathyan, A.[†], Kurtz, I.S.[†], Rathore, P., Emrick, T., **Schiffman, J.D.*** (2023) "Using catechol and zwitterion-functionalized copolymers to prevent dental bacterial adhesion" *ACS Applied Bio Materials*. 6 (7), 2905–2915. DOI: 10.1021/acsabm.3c00371.
81. Diep, E. & **Schiffman, J.D.*** (2023) "Establishing crosslinking methods for the controlled release from alginate nanofibers" *Biomacromolecules*. 24 (6), 2908–2917. DOI: 10.1021/acs.biomac.3c00274
80. Diep, E. & **Schiffman, J.D.*** (2023) "Electrospinning Living Bacteria: A Review of Applications from Agriculture to Health Care" *ACS Applied Bio Materials*. 6 (3), 951–964. DOI: 10.1021/acsabm.2c01055
 - **Invited Spotlight on Application**
79. **Schiffman, J.D.*** (2023) "ACS Applied Engineering Materials: A new journal for applied materials research" *ACS Applied Engineering Materials*. 1 (1), 1-2. DOI: 10.1021/acsanm.2c00098
78. Regan, D.P., Fong, C.; Bond, A.C.S., Desjardins, C., Hardcastle, J., Hung, S.-H., Holmes, A.P., **Schiffman, J.D.**, Maginnis, M.S., Howell, C.* (2022) "Improved recovery of captured airborne bacteria and viruses with liquid-coated air filters" *ACS Applied Materials & Interfaces*. 14 (45), 50543–50556. DOI: 10.1021/acsami.2c14754.
77. Ward, L.M.[†], Shah, R.M.[†], **Schiffman, J.D.***, Weinman, S.T.* (2022) "Nanopatterning reduces bacteria fouling in ultrafiltration" *ACS ES&T Water*. 2(9), 1593–1601. DOI: 10.1021/acsestwater.2c00256
76. Cihanoğlu, A., **Schiffman, J.D.***, Altinkaya, S.A.* (2022) "Biofouling-resistant ultrafiltration membranes via co-deposition of dopamine and cetyltrimethylammonium bromide with retained size selectivity and water flux" *ACS Applied Materials & Interfaces*. 14, 33, 38116–38131. DOI: 10.1021/acsami.2c05844
75. Sanjayan, C.G., Jyothi, M.S., Balakrishna, R.G., **Schiffman, J.D.**, Sakar, M., Budagumpi, S. (2022) "Aqueous, non-polymer-based perovskite quantum dots for bioimaging; Conserving fluorescence and long-term stability via simple and robust synthesis" *ACS Applied Materials & Interfaces* 14 (34), 38471–38482. DOI: 10.1021/acsami.2c08087
74. Sun, J., **Schiffman, J.D.***, Perry, S.L.* (2022) "Linear viscoelasticity and time-alcohol superposition of chitosan/hyaluronic acid complex coacervates" *ACS Applied Polymer Materials*. 4(3), 1617–1625. DOI: 10.1021/acsapm.1c01411

73. Shah, R.M., Cihanoğlu, A., Hardcastle, J., Howell, C., **Schiffman, J.D.*** (2022) "Liquid-infused membranes exhibit stable flux and fouling resistance" *ACS Applied Materials & Interfaces*. 14(4), 6148–6156. DOI: 10.1021/acscami.1c20674
72. Cihanoğlu, A., **Schiffman, J.D.**, Altinkaya, S.A.* (2021) "Ultrasound-assisted dopamine polymerization: Rapid and oxidizing agent-free PDA coatings on membrane surfaces" *Chemical Communications*. 57, 13740-13743. DOI: 10.1039/D1CC05960B
71. Hung, S-H., Bowden, M.E.^{UG}, Peltier, R., **Schiffman, J.D.*** (2021) "Optimizing the packing density and chemistry of cellulose nanofilters for high-efficiency particulate removal" *Industrial & Engineering Chemistry Research*. 60(43), 15720–15729. DOI: 10.1021/acs.iecr.1c03051
- **Invited to Special Forum Celebrating the 2021 I&EC Research Class of Influential Researchers**
70. Huang, M.[†], Liu, Y.[†], Khalkhali, Z., Kim, A., Hu, W., Rothstein, J.P., Lee, J-H., Klier, J., **Schiffman, J.D.*** (2021) "Epoxy resin-encapsulated polymer microparticles for room-temperature cold sprayable coatings" *ACS Applied Materials & Interfaces*. 13(42), 50358–50367. DOI: 10.1021/acscami.1c15415
69. Dobosz, K.M., Kuo-Leblanc, C.A.^{UG}, Bowden, M.E.^{UG}, **Schiffman, J.D.*** (2021) "Robust, small diameter hydrophilic nanofibers improve the flux of ultrafiltration membranes" *Industrial & Engineering Chemistry Research*. 60(25), 9179–9188. DOI: 10.1021/acs.iecr.1c01332
68. Meng, X., Du, Y., Liu, Y., Coughlin, E.B., Perry, S.L.* **Schiffman, J.D.*** (2021) "Electrospinning fibers from oligomeric complex coacervates: No chain entanglements needed" *Macromolecules*. 54, 11, 5033–5042. DOI: 10.1021/acs.macromol.1c00397
67. Zhou, Z., Lopez-Dominguez, P., Abdullah, M., Barber, D., Meng, X., Park, J., Van Driessche, I., **Schiffman, J.D.**, Crosby, A., Kittilstved, K., Nonnenmann, S.S.* (2021) "Memristive behavior of mixed oxide nanocrystal assemblies" *ACS Applied Materials & Interfaces*. 13, 18, 21635–21644. DOI: 10.1021/acscami.1c03722
66. Diep, E. & **Schiffman, J.D.*** (2021) "Encapsulating bacteria into alginate-based nanofibers" *Biomaterials Science*. 9, 4364-4373. DOI: 10.1039/D0BM02205E
- **Invited to 2021 Biomaterials Science Emerging Investigators Issue**
 - **In Special Collection Biomaterials Science Most Popular 2021**
 - **One of the Top 25 Articles of 2021**
65. Rathore, P. & **Schiffman, J.D.*** (2021) "Beyond the single nozzle: Coaxial electrospinning enables innovative nanofiber chemistries, geometries, and applications" *ACS Applied Materials & Interfaces*. 13, 1, 48–66. DOI: 10.1021/acscami.0c17706
- **Invited Spotlight on Application**
64. Mijailovica, A.S., Galarza, S., Raayai-Ardakanic, S., Birch, N.P., **Schiffman, J.D.**, Crosby, A.J., Cohen, T., Peyton, S.R., Van Vliet, J.J. (2021) "Localized characterization of brain tissue mechanical properties by needle induced cavitation rheology and volume controlled cavity expansion" *Journal Mechanical Behavior of Biomedical Materials*. 114, 104168. DOI: 10.1016/j.jmbbm.2020.104168
63. Holland, M., Eggensperger, C.G., Giagnorio, M., **Schiffman, J.D.**, Tiraferri, A., Zodrow, K.R.* (2020) "Facile post-processing alters permeability and selectivity of microbial cellulose ultrafiltration" *Environmental Science & Technology*. 54, 20, 13249–13256. DOI: 10.1021/acs.est.0c00451
62. Huang, M., Liu, Y., Klier, J.* **Schiffman, J.D.*** (2020) "High-performance, UV-curable crosslinked films via grafting of hydroxyethyl methacrylate methylene malonate" *Industrial & Engineering Chemistry Research*. 59(10), 4542-4548. DOI: 10.1021/acs.iecr.9b06618
61. Eggensperger, C.G., Giagnorio, M., Holland, M.D., Dobosz, K.M., **Schiffman, J.D.**, Tiraferri, A., Zodrow, K.R.* (2020) "Sustainable living filtration membranes" *Environmental Science & Technology Letters*. 7(3), 213-218. DOI: 10.1021/acs.estlett.0c00019
- **Highlighted as ACS Editors' Choice**
 - **Featured in C&EN (2020) "Taking the Diet Coke-and-Mentos demo to new heights, and testing a kombucha-based water filter" 98(14).** [link](#)
60. Sharma, A., Kwak, J-G.^{UG}, Kolewe, K.W., **Schiffman, J.D.**, Forbes, N.* **Schiffman, J.D.**, Lee, J.* (2020) "In vitro reconstitution of an intestinal mucus layer shows that cations and pH control the pore structure that regulates its permeability and barrier function" *ACS Applied Bio Materials*. 3(5), 2897–2909. DOI: 10.1021/acscabm.9b00851

59. Heckmann, T.S. & **Schiffman, J.D.*** (2020) "Spatially organized nanopillar arrays dissimilarly affect the antifouling and antibacterial activities of *Escherichia coli* and *Staphylococcus aureus*" *ACS Applied Nano Materials*. 3(2), 977-984. DOI: 10.1021/acsnm.9b01942
- **Invited to Special Forum Celebrating the Contributions of Young Investigators for Winning the ACS Applied Materials & Interfaces Young Investigator Award**
58. Zhuang, J., Zhao, B., Meng, X., **Schiffman, J.D.**, Perry, S.L., Vachet, R.W., Thayumanavan, S.* (2020) "Programmable chemical switch based on triggerable michael acceptors" *Chemical Science*. 11, 2103-2111. DOI: 10.1039/C9SC05841A
57. Sun, J., Perry, S.L.*, **Schiffman, J.D.*** (2019) "Electrospinning nanofibers from chitosan-hyaluronic acid complex coacervates" *Biomacromolecules*. 20(11), 4191-4198. DOI: 10.1021/acs.biomac.9b01072
56. Contreras, A., Raxworthy, M., Wood, S., **Schiffman, J.D.***, Tronci, G.* (2019) "Photodynamically active electrospun fibers for antibiotic-free infection control" *ACS Applied Bio Materials*. 2(10), 4258-4270. DOI: 10.1021/acsubm.9b00543
55. Kurtz, I.S.†, Shuo, S.†, Hao, X.†.UG, Huang, M., Perry, S.L.*, **Schiffman, J.D.*** (2019) "Bacteria-resistant, transparent, free-standing films prepared from complex coacervates" *ACS Applied Bio Materials*. 2 (9), 3926-3933. DOI: 10.1021/acsubm.9b00502
54. Li, B., Dobosz, K.M., Zhang, H., **Schiffman, J.D.**, Saranteas, K., Henson, M.A.* (2019) "Predicting the performance of pressure filtration processes by coupling computational fluid dynamics and discrete element methods" *Chemical Engineering Science*. 208, 115162. DOI: 10.1016/j.ces.2019.115162
53. Huang, M., Yang, G., Liu, Y., Klier, J., **Schiffman, J.D.*** (2019) "Anionic polymerization of methylene malonate yields high performance coatings." *ACS Applied Polymer Materials* 1(4), 657–663. DOI: 10.1021/acspap.8b00135
52. Kolewe K.W., Kalesin S., Shave, M., **Schiffman J.D.*** Santore M.M.* (2019) "Mechanical properties and concentrations of poly(ethylene glycol) in hydrogels and brushes direct the surface transport of *Staphylococcus aureus*" *ACS Applied Materials & Interfaces* 11(1), 320–330. DOI: 10.1021/acsmi.8b18302
- **Highlighted as ACS Editors' Choice**
51. Yang, G., Xie, W., Huang, M., Champagne, V.K., Lee, J-H., Klier, J.*, **Schiffman, J.D.*** (2019) "Polymer particles with a low glass transition temperature containing thermoset resin enable powder coatings at room temperature" *Industrial & Engineering Chemistry Research*. 58(2), 908–916. DOI: 10.1021/acs.iecr.8b04698
50. Dobosz, K.M., Kuo-LeBlac, C.A.UG, Emrick, T., **Schiffman, J.D.*** (2019) "Antifouling ultrafiltration membranes with retained pore size by controlled deposition of zwitterionic polymers and poly(ethylene glycol)" *Langmuir*. 35(5), 1872–1881. DOI: 10.1021/acs.langmuir.8b02184
- **Invited Full Article to Special Issue "Zwitterionic interfaces: Concepts and emerging applications"**
49. Meng, X., **Schiffman, J.D.***, Perry, S.L.* (2018) "Electrospinning cargo-containing polyelectrolyte complex fibers: Correlating molecular interactions to complex coacervate phase behavior and fiber formation" *Macromolecules*. 51(21), 8821–8832. DOI: 10.1021/acs.macromol.8b01709
48. Polio, S.R., Kundu, A.N., Dougan, C.E., Birch, N.P., Aurian-Blajeni, D.E., **Schiffman, J.D.**, Crosby, A.J., Peyton, S.R.* (2018) "Cross-platform mechanical characterization of lung tissue" *PLoS ONE* 13(10), e0204765. DOI: 10.1371/journal.pone.0204765
47. Gonzalez Arellano, D.L.†, Kolewe, K.W.†, Champagne, V.K.UG†, Kurtz, I.S., Burnett, E.K., Zakashansky, J.A.UG, Dündar Arisoy, F., Briseño, A., **Schiffman, J.D.*** (2018) "Gecko-inspired biocidal organic nanocrystals initiated from a pencil-drawn graphite template" *Scientific Reports* 8, 11618. DOI: 10.1038/s41598-018-29994-3
46. Kurtz, I.S. & **Schiffman, J.D.*** (2018) "Current and emerging approaches to engineer antibacterial and antifouling electrospun nanofibers" *Materials* 11(7), 1059. DOI: 10.3390/ma11071059
- **Invited Review Article to Special Issue "Electrospun Materials 2018"**
45. Kolewe, K.W., Dobosz, K.M., Emrick, T., Nonnenmann, S.S., **Schiffman, J.D.*** (2018) "Fouling-resistant hydrogels prepared by the swelling-assisted infusion and polymerization of dopamine" *ACS Applied Bio Materials* 1(1), 33–41. DOI: 10.1021/acsubm.8b00001
44. Kolewe, K.W., Zhu, J., Mako N.UG, Nonnenmann, S.S., **Schiffman, J.D.*** (2018) "Bacterial adhesion is affected by the thickness and stiffness of poly(ethylene glycol) hydrogels" *ACS Applied Materials & Interfaces* 10(3), 2275–2281. DOI: 10.1021/acsmi.7b12145

43. Dundar, F., Kolewe, K.W., Homyak, B., Kurtz, I.S., **Schiffman, J.D.**, Watkins, J.J. (2018) "Bioinspired photocatalytic shark skin surfaces with antibacterial and antifouling activity via nanoimprint lithography" *ACS Applied Materials & Interfaces* 10(23), 20055–20063. DOI: 10.1021/acsami.8b05066
- **Highlighted in ACS News Service Weekly PressPac, Health Medicine Network, IEEE Engineering 360, Science and Technology Research News, Forbes, etc**
42. Chandan, H.R., **Schiffman, J.D.**, Balakrishna, G. (2018) "Quantum dots as fluorescent probes: Synthesis, surface chemistry, energy transfer mechanisms, and applications" *Sensors & Actuators: B. Chemical* 258, 1191-1214. DOI: 10.1016/j.snb.2017.11.189
41. Sae-ung, P., Kolewe, K.W., Bai, Y., Rice, E.W.^{UG}, **Schiffman, J.D.***, Emrick, T., Hoven, V.P.* (2017) "Antifouling stripes prepared from clickable zwitterionic copolymers" *Langmuir* 33(28), 7028–7035. DOI: 10.1021/acs.langmuir.7b01431
40. Meng, X., Perry, S.L.* , **Schiffman, J.D.*** (2017) "Complex coacervation: Chemically stable fibers electrospun from aqueous polyelectrolyte solutions" *ACS Macro Letters* 6, 505–511. DOI: 10.1021/acsmacrolett.7b00173
- **Highlighted in Biotech Week 06/28/2017**
39. Dobosz, K.M., Kuo-LeBlac, C.A.^{UG}, Martin, T.J.^{UG}, **Schiffman, J.D.*** (2017) "Ultrafiltration membranes enhanced with electrospun nanofibers exhibit improved flux and fouling resistance" *Industrial & Engineering Chemistry Research* 56(19), 5724–5733. DOI: 10.1021/acs.iecr.7b00631
38. Kolewe, K.W.[†], Dobosz, K.M.[†], Rieger, K.A., Chang, C-C., Emrick, T., **Schiffman, J.D.*** (2016) "Antifouling electrospun nanofiber mats functionalized with polymer zwitterions" *ACS Applied Materials & Interfaces* 8(41) 27585–27593. DOI: 10.1021/acsami.6b09839
37. Rieger, K.A., Porter, M.^{REU}, **Schiffman, J.D.*** (2016) "Polyelectrolyte-functionalized nanofiber mats control the collection and inactivation of *Escherichia coli*" *Materials* 9, 297. DOI:10.3390/ma9040297
- **Invited Full Article to Special Issue "Electrospun Materials"**
36. Sui, S., Wang, Y., Kolewe, K.W., Srajer, V., Henning, R., **Schiffman, J.D.**, Dimitrakopoulos, C., Perry, S.L.* (2016) "Graphene-based microfluidics for serial crystallography" *Lab on a Chip* 16, 3082-3096. DOI: 10.1039/C6LC00451B
- **Invited Full Article to Special Issue "2016 Lab on a Chip Emerging Investigators"**
 - **Highlighted in Chemistry World & the 2016 Annual Report for Advanced Photon Source**
35. Rieger, K.A., Thyagarajan, R., Hoen M.^{REU}, Ford, D., **Schiffman, J.D.*** (2016) "Transport of microorganisms into cellulose nanofiber mats" *RSC Advances* 6, 24438-24445. DOI: 10.1039/C6RA01394E
34. Rieger, K.A.[†], Cho, H.J.[†], Yeung, H.^{UG}, Fan, W., **Schiffman, J.D.*** (2016) "Antimicrobial activity of silver ion exchanged zeolites immobilized on cellulose nanofibers" *ACS Applied Materials & Interfaces* 8(5), 3032–3040. DOI: 10.1021/acsami.5b10130
33. Chang, C-C., Kolewe, K.W., Li, Y., Kosif, I., Freeman, B.D., Carter, K., **Schiffman, J.D.***, Emrick, T.* (2016) "Underwater superoleophobic surfaces prepared from polymer zwitterion/dopamine composite coatings." *Advanced Materials Interfaces* 1500521, 1-9. DOI: 10.1002/admi.201500521
32. Rieger, K.A., Birch, N.P., **Schiffman, J.D.*** (2016) "Electrospinning chitosan/poly(ethylene oxide) solutions with immiscible oils: Correlating solution rheology to nanofiber formation" *Carbohydrate Polymers* 139, 131-138. DOI: 10.1016/j.carbpol.2015.11.073
31. Jafferji, H., Sakulich, A.R.* , **Schiffman, J.D.*** (2016) "Preliminary study on mitigating steel reinforcement corrosion with bioactive agent" *Cement and Concrete Composites* 69, 9–17. DOI: 10.1016/j.cemconcomp.2016.02.011
30. Li, Y., John, J., Kolewe, K.W., **Schiffman, J.D.**, Carter, J.D.* (2015) "Scaling up nature — Large area flexible biomimetic surfaces" *ACS Applied Materials & Interfaces* 7(42), 23439–23444. DOI: 10.1021/acsami.5b04957
29. Kolewe, K.W., Peyton, S.R., **Schiffman, J.D.*** (2015) "Fewer bacteria adhere to softer hydrogels" *ACS Applied Materials & Interfaces* 7(35), 19562-19569. DOI: 10.1021/acsami.5b04269
28. Jansen, L.E., Birch, N.P., **Schiffman, J.D.**, Crosby, A.J., Peyton, S.R.* (2015) "Mechanics of intact bone marrow" *Journal of the Mechanical Behavior of Biomedical Materials* 50, 299–307. DOI: 10.1016/j.jmbbm.2015.06.023
27. Birch, N.P., Pandres, E.P.^{UG}, Barney, L., Peyton, S.R., **Schiffman, J.D.*** (2015) "Thermal-responsive behavior of a cell compatible chitosan:pectin hydrogel" *Biomacromolecules* 16(6), 1837–1843. DOI: 10.1021/acs.biomac.5b00425

26. Dobosz, K.M.[†], Kolewe, K.W.[†], **Schiffman, J.D.*** (2015) "Green materials science and engineering reduces biofouling: Approaches for medical and membrane-based technologies" *Frontiers in Microbiology* 6:86. DOI: 10.3389/fmicb.2015.00086
- **Invited Review Article to Special Issue on "Nanomaterial-Biofilm Interactions"**
25. Rieger, K.A., Eagan, N.M.^{UG}, **Schiffman, J.D.*** (2015) "Encapsulation of cinnamaldehyde into nanostructured chitosan films" *Journal of Applied Polymer Science* 132, 41739. DOI: 10.1002/APP.41739
24. Rieger, K.A. & **Schiffman, J.D.*** (2014) "Electrospinning an essential oil: Cinnamaldehyde enhances the antimicrobial efficacy of chitosan/poly(ethylene oxide) nanofibers" *Carbohydrate Polymers* 113, 561–568. DOI: 10.1016/j.carbpol.2014.06.075
23. Birch, N.P. & **Schiffman, J.D.*** (2014) "Characterization of self-assembled polyelectrolyte complex nanoparticles formed from chitosan and pectin" *Langmuir* 30(12) 3441-3447. DOI: 10.1021/la500491c
22. Rieger, K.A., Birch, N.P., **Schiffman, J.D.*** (2013) "Designing electrospun nanofiber mats to accelerate wound healing— A review." *Journal of Materials Chemistry B* 1(36) 4531-4541. DOI: 10.1039/C3TB20795A
- **Invited Applications Review Article**
21. **Schiffman, J.D.***[†], Engel, Y.[†], Goddard, J.D., Rotello, V.M.* (2012) "Nanomanufacturing of biomaterials" *Materials Today* 15(11) 80-87. DOI: 10.1016/S1369-7021(12)70217-1
- **Invited Review Article**

BEFORE UMASS

20. Hoover, L.A., **Schiffman, J.D.**, Elimelech, M.* (2013) "Nanofibers in thin-film composite membrane support layers: Enabling expanded application of forward and pressure retarded osmosis" *Desalination* 308, 73-81. DOI: 10.1016/j.desal.2012.07.019
- **Highlighted in Special Issue "New Directions in Desalination"**
19. Zodrow, K.R., **Schiffman, J.D.***, Elimelech, M. (2012) "Biodegradable polymer (PLGA) coatings featuring cinnamaldehyde and carvacrol mitigate biofilm formation" *Langmuir* 28(39) 13993-13999. DOI: 10.1021/la303286v
18. **Schiffman, J.D.***, Wang, Y., Giannelis, E.P., Elimelech, M. (2011) "Biocidal activity of plasma modified electrospun polysulfone mats functionalized with polyethyleneimine-capped silver nanoparticles" *Langmuir* 27(21) 13159-13164. DOI: 10.1021/la202605z
17. **Schiffman, J.D.*** & Elimelech, M. (2011) "Antibacterial activity of electrospun polymer mats with incorporated narrow diameter single-walled carbon nanotubes" *ACS Applied Materials & Interfaces* 3(2) 462-468. DOI: 10.1021/am101043y
- **Highlighted in "Noteworthy Chemistry" by the American Chemical Society**
16. Vecitis, C.D.*[†], Schnoor, M.^{UG}, Rahaman, M.S., **Schiffman, J.D.**, Elimelech, M. (2011) "Electrochemical multiwalled carbon nanotube filter for viral and bacterial removal and inactivation" *Environmental Science & Technology* 45 (8) 3672-3679. DOI: 10.1021/es2000062
15. Yip, N.Y., Tiraferri, A., Phillip, W.A., **Schiffman, J.D.**, Hoover, L.A., Kim, Y.C., Elimelech, M.* (2011) "Thin-film composite pressure retarded osmosis membranes for sustainable power generation from salinity gradients" *Environmental Science & Technology* 45(10) 4360-4369. DOI: 10.1021/es104325z
14. Tiraferri, A., Yip, N.Y., Phillip, W.A., **Schiffman, J.D.**, Elimelech, M.* (2011) "Relating performance of thin-film composite forward osmosis membranes to support layer structure and formation" *Journal of Membrane Science* 367, 340-352. DOI: 10.1016/j.memsci.2010.11.014
- **In Top 25 Most Cited Articles for 2010 and 2011**
13. Yip, N.Y., Tiraferri, A., Phillip, W.A., **Schiffman, J.D.**, Elimelech, M.* (2010) "High performance thin-film composite membrane for forward osmosis desalination" *Environmental Science & Technology* 44(10) 3812-3818. DOI: 10.1021/es1002555
12. **Schiffman, J.D.**[†], Kiechel, M.A.[†], Donius, A.E., Wegst, U.G., Schauer, C.L.* (2013) "Crosslinking poly(allylamine) fibers electrospun from basic and acidic solutions" *Journal of Materials Science* 48(22) 7856-7862. DOI: 10.1007/s10853-013-7426-2
11. Brenner, E.K.^{UG}, **Schiffman, J.D.**, Toth, L.J.^{UG}, Szweczyk, J.C., Schauer, C.L.* (2013) "Phosphate salts facilitate the electrospinning of hyaluronic acid fiber mats" *Journal of Materials Science* 48(22) 7805-7811. DOI: 10.1007/s10853-013-7532-1

10. Brenner, E.K.^{UG}, **Schiffman, J.D.**, Thomson, E.S.^{UG}, Toth, L.J.^{UG}, Schauer, C.L.* (2012) "Electrospinning of hyaluronic acid nanofibers from aqueous ammonium solutions" *Carbohydrate Polymers* 87(1) 926-929. DOI: 10.1016/j.carbpol.2011.07.033
9. **Schiffman, J.D.**, Blackford, A.C.^{UG}, Wegst, U.G.K., Schauer, C.L.* (2011) "Carbon black immobilized in electrospun chitosan membranes" *Carbohydrate Polymers* 84(4) 1252-1257. DOI: 10.1016/j.carbpol.2011.01.013
8. **Schiffman, J.D.**, Stulga, L.A.^{UG}, Schauer, C.L.* (2009) "Chitin and chitosan: Transformations due to the electrospinning process" *Polymer Engineering and Science* 49(10) 1918-1928. DOI: 10.1002/pen.21434
7. Binetti, V.E., **Schiffman, J.D.**, Leafer, O.D., Spanier, J.E., Schauer, C.L.* (2009) "The natural transparency and piezoelectric response of the *Greta oto* butterfly wing" *Integrative Biology* (3) 324-329. DOI: 10.1039/B820205B
6. **Schiffman, J.D.** & Schauer, C.L.* (2009) "Solid state characterization of α -chitin from *Vanessa cardui* Linnaeus wings" *Materials Science and Engineering, C* 29(4) 1370-1374. DOI: 10.1016/j.msec.2008.11.006
5. Laudenslager, M.L.^{UG}, **Schiffman, J.D.**, Schauer, C.L.* (2008) "Carboxymethyl chitosan as a matrix material for platinum, gold, and silver nanoparticles" *Biomacromolecules* 9(10) 2682-2685. DOI: 10.1021/bm800835e
4. Garipcan, B., Winters, J.^{UG}, Atchison, J.S., Cathell, M., **Schiffman, J.D.**, Leafer, O.D., Nonnenmann, S.S., Schauer, C.L., Pikin, E., Nabet, B., Spanier, J.E.* (2008) "Controllable formation of nano-scale patterns on TiO₂ by conductive-AFM nanolithography" *Langmuir* 24(16) 8944-8949. DOI: 10.1021/la800911x
3. **Schiffman, J.D.** & Schauer, C.L.* (2008) "A review: Electrospinning of biopolymer nanofibers and their applications" *Polymer Reviews* 48(2) 317-352. DOI: 10.1080/15583720802022182
 - **3rd Most Cited Article in Journal (As of 7/21/2021)**
2. **Schiffman, J.D.** & Schauer, C.L.* (2007) "One-step electrospinning of cross-linked chitosan nanofibers" *Biomacromolecules* 8(9) 2665-2667. DOI: 10.1021/bm7006983
1. **Schiffman, J.D.** & Schauer, C.L.* (2007) "Cross-linking chitosan nanofibers" *Biomacromolecules* 8(2) 594-601. DOI: 10.1021/bm060804s
 - **In Top 20 Most-Accessed Articles of 2007**

PATENTS

8. Zodrow, K.R., Eggensperger, C., Giagnorio, M., Holland, M., Dobosz, K.M., **Schiffman, J.D.**, Tiraferri, A., Bechtel, C., Jiang, D. "Living filtration membrane" [link](#).
7. Champagne, V.K., **Schiffman, J.D.**, Klier, J., Yang, G., Huang, M. "Reactive particles for coating technologies" [link](#).
6. Huang, M., Yang, G., Klier, J., **Schiffman, J.D.**, Pasule, A., Holzer, M.R. "Emulsion polymers crosslinked with compounds containing two or more dicarbonyl-substituted 1 alkene units" [link](#).
5. Perry, S.L., **Schiffman, J.D.**, Meng, X. "Polymer nanofibers from electrospinning of complex coacervates, and compositions and methods thereof" [link](#).
4. Perry, S.L., **Schiffman, J.D.**, Meng, X. "Ultra-stable printing and coatings using aqueous complex coacervates, and compositions and methods thereof" [link](#).
3. **Schiffman, J.D.** and Rieger, K.A. "Essential oils or volatile organics thereof electrospun in chitosan nanofiber mats." [link](#).
2. Yip, N.Y., Tiraferri, A., Phillip, W.A., **Schiffman, J.D.**, Elimelech, M. "High performance thin-film composite membrane for forward osmosis desalination." [link](#).
1. **Schiffman, J.D.** & Schauer, C.L. "Fibrous mats containing chitosan nanofibers." [Link](#).

BOOK CHAPTERS (OF 5 TOTAL)

5. Diep, E.[†], Kurtz, I.S.[†], and **Schiffman, J.D.** (2022) Interfacing electrospun nanofibers with microorganisms: Applications from killing to repelling to delivering living microbes. In: Science, Technology, and Applications of Polymer Nanofibers, 1st Edition, A.L. Andrady and S.A. Khan, eds. John Wiley & Sons, Inc., U.S.A. ISBN 978-1119267683.

EDITORIAL POSTIONS

- Deputy Editor, [ACS Applied Engineering Materials](#) (2022-present)

- Editorial Advisory Board, ACS Applied Materials & Interfaces (2022-present)
- Editorial Board Member, BMC Materials (part of Springer Nature) (2019-present)
- Journal Guest Editor, Nanotechnology, Special focus: "[Life Cycle of Nanomaterials](#)" (2015-2018)

INVITED CONFERENCE AND COLLOQUIA PRESENTATIONS. Dr. Schiffman has given ~90 invited keynotes, conference talks, and colloquia presentations in Austria, Australia, Canada, China, India, Ireland, Mexico, Singapore, and the United States. Along with her research team, >200 contributed talks have been presented and many undergraduate and graduate students advised by Schiffman have received competitive awards for their presentations from AIChE, ACS, American Membrane Technology Association, Thermoset Resin Formulators Association, etc. Full details available upon request.

RESEARCH SUPPORT. Dr. Schiffman has received awards totaling \$20M (with \$5.2M going directly to the Schiffman lab). These totals do not include graduate fellowships. She has served as the PI on:

- 9 Major Awards from the National Science Foundation (NSF)
- >10 Major Awards from the Army Research Lab/Army Research Office
- >10 Major Awards from Corporate Sponsors (BASF, Sirtus, etc)
- 4 Awards from other Federal Agencies (USDA, USGA, ACI)
- Additional support received from the Hamilton Company, Andrew Mellon Foundation, ACS Foundation, the Armstrong Fund for Science, UMass Faculty Research Grant, Private donors, NSF SEED funds (2x), NSF funds to support conference symposium (2x)

MENTORING LAB MEMBERS. Dr. Schiffman has mentored 25 graduate students, 57 undergraduate students, and 5 postdoctoral associates in her lab. While in her lab, students have been awarded a wide variety of awards.

Some example awards are provided below:

- ACS Ciba Travel Award in Green Chemistry
- Eli Lilly/ACS Women Chemist Committee Travel Award
- Women in Chemical Engineering (WIC) Travel Award
- 3M RISE (Raising Influence in Science & Engineering)
- AAAS CASE (Catalyzing Advocacy in Science and Engineering) Travel Award
- BASF North American Research Forum Fellowship
- PPG Fellowship
- American Membrane Technology Association (AMTA)/Reclamation Fellowships for Membrane Technology
- Fulbright Fellowship
- Innovation Challenge Winner; Graduate School's Three Minute Thesis (3MT) Competition Winner

Some companies that graduate students have had internships/co-ops at include:

- Merck
- GE Global Research
- 3M Internship
- Apple
- Vertex Pharmaceutical
- Saint-Gobain

EDUCATIONAL ACTIVITIES

Due to sabbatical leave, no teaching activities are listed for Fall 2022 or Spring 2023

- **CHEM-ENG 320: Kinetics and Reactor Design**, Falls 2012-2021

Junior-level undergraduate core Chemical Engineering course

- **CHEM-ENG 589: Nanostructured Biomaterials** (formerly CHEM-ENG 597D), Springs 2012-2022

A new course designed for upper-level undergraduate and graduate students

- **CHEM-ENG 291H: Honors Colloquium** (formerly CHEM-ENG H226), Spring 2012-2017

A new course designed for Sophomore Honors Chemical Engineering students

- **CHEM-ENG 491H: Honors Colloquium** (formerly CHEM-ENG H401), Fall 2012-2016

A new course designed for Senior Honors Chemical Engineering students

- **CHEM-ENG H402: Honors Colloquium**, Spring 2013

A new course designed for Senior Honors Chemical Engineering students

GUEST LECTURES

- CHEM 797J ST: Ethical Conduct of Research
- CHEM-ENG 290B, Experimental Design and Methods
- NIH BTP Program: Biotech tAle, Biomaterials: Slippery or Sticky?
- PSE-797NR, Foundations of Soft Materials for Life Sciences II
- CHEM-ENG 590E, Microfluidics and Microscale Analysis in Materials and Biology
- MICROBIO 391H, The Secret Lifestyle of Microorganisms, Honors Colloquium for Microbiology
- CHEM-ENG 578, Nanomaterials Chemistry and Engineering
- CHEM-ENG/MIE 590L, Materials Science and Engineering Project
- MIE 201, Introduction to Materials Science and Engineering
- FFYS 197CEE1, The Janus Face of Nanotechnology: Promises, Products and Problems
- CHEM-ENG 110, Introduction to Chemical Engineering

Teaching Conferences/Training

- Completed Advancing DEIR: Practical Strategies for ACS Editors (2022)
- Completed ACS Leading Inclusively: Beyond Lip Service (2022)
- Completed Multi-part AAAS Course: Building Gender Equity in the Academy (2021)
- Participant in the American Society for Engineering Education (ASEE) Conference, Orono, ME (2012)
- Attendee, NSF-Women's International Research Engineering Summit (WIRES), Orlando, FL (2011)
 - **Schiffman Awarded NSF Travel Grant**
- Received Certification, "Fundamentals of Teaching Engineering" from Yale University (2010)

SERVICE ACTIVITIES

Service to the Chemical Engineering Department/College of Engineering at UMass Amherst

- Director, Materials Engineering Certificate (2023-present)
- Department Head of Chemical Engineering (Acting 9/2021-10/2021; Interim 10/2021-present)
- Associate Department Head of Chemical Engineering (Interim 5/2020-1/2021; 1/2021-9/2021)
- Graduate Admissions Committee (Co-chair: 2020-present & Member 2012-2020)
- Member, Strategic Planning Committee for the College of Engineering (2019-2020)
- Departmental Personal Committee (DPC) (Chair: 2020-2021, Member: 2015-2016 (Jr) & 2018-2020)
- Member, Department of Materials Science and Engineering (MSE) Steering Committee (2016-2020)
- Faculty Search Committee Member: *10 searches within the College of Engineering/IALS/UMass*
- Program Director, Chemical Engineering Departmental Honors Program (2011-2017)
- Chair, Senior Thesis Defense Presentations at the Massachusetts Statewide Annual Undergraduate Research Conference (2013-2019)
- Design new workshop "Going to Graduate School?" (2011, 2012)
- Member, Undergraduate Program Committee (2014-2017)
- Member, Ph.D. Qualifying Exam Committee (2012-2019)
- New Student Orientation – Undergraduate Advising (Summers 2012-present)
- Undergraduate Academic Advising (2011-present)

Service to UMass Amherst

- Member, MSE IDGP Steering Committee (2023-present)
- Member, UMass Electron Microscopy Advisory Committee (2021-present)
- Member, IALS M2M Steering Committee (2016-present)
- Chair, IALS Theme Leader "Biomaterials for Devices and Regenerative Medicine (BDRM)" (2016-2022)
- Member, IALS Theme "Microbes in Human Health and Disease (MHHD)" (2016-2022)
- Member, Faculty Senate's University Relations and Advancement Council (2015-2018)
- NSF NRT-Soft Materials for Life Sciences (SMLS) Graduate Student Training Grant Program
 - Executive Member of the Leadership Team (2015-2021)
 - Recruitment and Diversity Committee (Member: 2015-2021)
- Founded and Faculty Advisor, Materials Research Society (MRS) Student Chapter (2014-present)
- NIH Chemistry-Biology Interface (CBI) Graduate Student Training Grant Program
 - Chair, CBI Diversity Equity and Inclusion Committee (2021-present)

- Executive Committee Member (2015-present)
- CBI Academic Committee Member (2014-2021)
- CBI Faculty participant (2012-present)
- Faculty Participant, NIH Biotechnology Training Program (BTP) (2015-present)
- University Goldwater and Udall Scholarship Committee (Nominate & advise applicants, 2014-2018)

Select Service that Supports Diversity, Equity, and Inclusion (After joining UMass Amherst)

- Affinity Project, Zoom with fifth-graders at Schools in PA (2022)
- In charge of recruitment efforts at Annual Biomedical Research Conference for Minority Students (ABRCMS) for UMass CBI program (2020-2022)
- Departmental representative on College of Engineering DEI Committee (2020-2022)
- Member, Department of Chemical Engineering DEI Committee (2019-2022; Chair: 2019-2020)
- NSF ADVANCE Collaboration & Equity Faculty Fellow (2019-2021)
- Member, Engineering Allies for Equity (UMass, 2020-present)
- Completed National Research Mentoring Network (NRMN) Mentor Training (2019)
- Lecturer, Summer Engineering Institute for High School Students (UMass, 2014-2020)
- Mentor, Graduate Women in STEM (GWIS) Luncheon (UMass, 2018)
- Invited Panelist, Round table discussion for junior faculty at the AIChE Annual Meeting, Women's Initiatives Committee (WIC) (San Francisco, CA, 2016)
- Invited Keynote/Developed Workshop, NEAGEP Seminar, "The Cover Letter That Will Get You Noticed" (UMass, 2015)
- Invited Panelist, Graduate Women in STEM (GWIS) Luncheon (UMass, 2015)
- Invited Discussion Leader & Poster Judge, 8th NEA Science Days (UPuerto Rico Mayaguez, 2015)
- Invited Panelist, "Game of Life" for Society of Women Engineers (SWE) (UMass, 2014)
- Mentor for High School Female Students at Women in Engineering Career Day (UMass, 2013)
- Invited Panelist, Women in Engineering Discussion for Senior Graduate Students (at Drexel, 2011)

Professional Service (excluding editorial positions)

- Director (2019-2021): Executive Council of AIChE MESD Area 8
- Symposium Organizer (2018-2020): "Biomaterials and Biointerfaces" for the Division of Colloid and Surface Chemistry at the 2020 Spring National ACS Meeting, Philadelphia, PA, March 22-26, 2020, Moved Virtual
- Invited member, Project Advisory Committees (PAC) (2018-2019): Water Research Foundation
- Invited Participant (2013): NSF US-China Workshop on Solar Energy and Environment. (30 persons total)
- Advisory Board Member (2011-present): Materials Young Alumni Advisory Board for Drexel University

Programming at National and International Technical Conferences.

- Chair, AIChE Annual Meeting 2021, MESD Poster Session & Competition (In Person & Virtual Session)
- Chair, Topical Plenary: Microbes at Biomedical Interfaces program at the 2021 AIChE Annual Meeting
- Chair, AIChE Annual Meeting 2020, MESD Poster Session & Competition
- Chair, Topical Plenary: Microbial Interactions with Biomaterials and Host Cells 2020 (All Invited Talks)
- Session Organizer, Topical Conference: Microbes at Biomedical Interfaces program at the 2020 AIChE Annual Meeting, Biophysical Properties of Microbes and Microbial Communities
- Chair, POLY-sponsored workshop, Layered Polymeric Systems 2020
- Chair, Topical Conference: Microbes at Biomedical Interfaces program at the 2019 AIChE Annual Meeting, Microbial Interaction with Biointerfaces
- Chair, AIChE Annual Meeting 2019, Excellence in Graduate Polymer Research (All Invited Talks)
- Chair, AIChE Annual Meeting 2018, Biomacromolecular Gels
- Chair, AIChE Annual Meeting 2017, Charged and Ion-Containing Polymers
- Chair, ACS National Meeting 2017, Polyelectrolyte Coacervates, Precipitates & Multilayers
- Chair/Discussion Leader, International Conference of Young Researchers on Advanced Materials (IUMRS-ICYRAM) 2016, Global Materials Network, Bangalore, India
- Chair, AIChE Annual Meeting 2016, Polymer Thin Films and Interfaces
- Chair, AIChE Annual Meeting 2016, Thin Film Block Copolymer Self-Assembly and Morphology
- Co-Chair, 90th ACS Colloid & Surface Science Symposium 2016, Biological Interfaces
- Committee Member, The Fiber Society Graduate Student Paper Competition (2015-2017)

- Chair, AIChE Annual Meeting 2015, Emerging Areas in Polymer Science & Engineering Plenary
- Chair, AIChE Annual Meeting 2014, Polymer Properties and Rheology
- Chair, The Fiber Society 2014, (Bio)active Fibers
- Co-Chair, AIChE Annual Meeting 2013, Nanoscale Structure in Polymers
- Co-Chair, AIChE Annual Meeting 2012, Charged and Ion-Containing Polymers
- Poster Judge, AIChE Annual Meeting, Division 8A Polymers, 2012-2022
- Advisory Committee, International Conference on Chemical and Bioprocess Engineering 2013, National Institute of Technology, India
- Chair/Discussion Leader, International Conference of Young Researchers on Advanced Materials (IUMRS-ICYRAM) 2012, Global Materials Network

Grant Refereeing: Dr. Schiffman has served as a Proposal Reviewer/Site Reviewer for the NSF, ACS, French National Research Agency, Israel Science Foundation, USDA, Water Research Foundation, New Zealand's Science Investment Round, National Science Centre, Poland

Ad-Hoc Journal Reviewer: As of July 2023, Dr. Schiffman has reviewed ~150 articles for ACS Journals, as well as articles for other publishers (i.e., Elsevier, Wiley). More information can be provided upon request.

Professional Society Memberships: Dr. Schiffman has continually been active in the American Institute of Chemical Engineers (AIChE) and the American Chemical Society (ACS). She has also been active in the Materials Research Society (MRS), The Fiber Society (FS), and the American Physical Society (APS).