Blake Simmons, Sandia National Laboratories

Dr. Blake A. Simmons grew up in Blair, Nebraska, a small town north of Omaha. He enlisted in the United States Navy out of high school, where he served as a Nuclear Propulsion Operator (Electrician's Mate) for six years, primarily on board the aircraft carrier USS Carl Vinson while stationed in Bremerton, WA. After leaving the Navy in 1994 with an honorable discharge as a Petty Officer, Second Class, he attended the University of Washington and obtained a B.S. in Chemical Engineering in 1997. He then attended graduate school at Tulane University after receiving a Louisiana Board of Regents Fellowship. He worked in the laboratory of Professor Vijay T. John, where the focus of his thesis work was the synthesis and characterization of templated nanomaterials. He graduated with a Ph.D. in Chemical Engineering from Tulane in 2001.

Blake then joined Sandia National Laboratories (Livermore, CA) in 2001 as a Senior Member of the Technical Staff, serving as a member of the Materials Chemistry Department. He participated on and led a variety of projects, including the development of cleavable surfactants, enzyme engineering for biofuel cells, microfluidics, and the synthesis of silicate nanomaterials. He was promoted to Principal Member of the Technical Staff in 2004. He expanded his research portfolio to include the design, fabrication, integration, and testing of polymeric microfluidic devices for several lab-on-a-chip and Homeland Security applications, and continued to pursue opportunities in renewable energy. He was promoted to Manager of the Energy Systems Department in 2006. The primary focus of the department was the development of novel materials-based solutions to meet the nation's growing energy demands.

In 2007, he was one of the principal co-investigators of the Joint BioEnergy Institute (JBEI, www.jbei.org), a $135M DOE funded project tasked with the development and realization of next-generation biofuels produced from non-food crops. He is currently serving as the Vice-President of the Deconstruction Division at JBEI, where he leads a team of 42 researchers working on advanced methods of liberating fermentable sugars from lignocellulosic biomass. He is involved in techno-economic and lifecycle analysis of advanced biofuels. He also manages the Biomass Science and Conversion Technology Department at Sandia National Laboratories. He has over 90 publications, book chapters, and patents. His work has been featured in the New York Times, the Wall Street Journal, the San Francisco Chronicle, EcoTV, and the KQED televised science program Quest.

Blake A. Simmons, Ph.D.

Sandia National Laboratories
Manager, Biomass Science and Conversion Technology Department
Livermore, CA 94550
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EDUCATION:

Tulane University, New Orleans, LA — 9/97 – 8/01
Ph.D., Chemical Engineering

University of Washington, Seattle, WA — 1/94 – 6/97
Bachelor of Science, Chemical Engineering

EXPERIENCE:

Sandia National Laboratories — 12/06 – present
Manager, Biomass Science and Conversion Technology Department
Manager, Energy Systems Department
Vice-President, Deconstruction Division, Joint BioEnergy Institute

- Managed a group of 62 staff members, technologists, post-docs, and interns
- Coordinated, wrote, and co-led Sandia's participation on the DOE BER funded $1345, five-year Joint Bioenergy Institute (JBEI), and will serve as Vice-President of Deconstruction (~$5M/yr for five years), FY2008-2012
- Particpated in GM CRADA that developed and analyzed a systems dynamics model of biofuels production within the United States
- Major departmental thrust areas: Biofuels, Biocatalysis, Biochemical Engineering, Nanoporous Materials, and Hydrogen Storage
- Led program development activities around biomass, biofuels, and nanoporous materials
- Coordinated and managed contracts/collaborations with university and industrial partners
- Served as Sandia technical lead for biochemical and thermochemical production of biofuels from biomass

Sandia National Laboratories — 10/05 – 12/06
Principal Member of the Technical Staff

- Served as technical and project lead for the bioinspired synthesis of hierarchical silica structures based on diatom biomineralization
- Served as technical and project lead for the enhanced production of biofuels through enzyme and metabolic engineering
- Served as technical lead for biofuels section of Sandia's Transportation Fuel Initiative
- Served as technical lead on the development of polymer-nanoparticle composites for next-generation radiation detectors
- Served as technical lead for nanoimprint lithography technologies that include electroplating, block copolymer self-assembly, and polymer replication
- Developed methods and protocols to utilize block copolymers in the realization of ordered nanopatterns for use in nanoimprint lithography and polymer replication
- Developed, designed, and fabricated polymeric microfluidic devices through injection molding and hot embossing for a variety of sensing and concentration applications including insulator-based dielectrophoresis

- Served as technical and project lead for the development of alternative desalination technologies that utilize clathrate hydrates and nanoporous membranes

Sandia National Laboratories 9/01 – 9/05
Senior Member of the Technical Staff

- Awarded research contract with Awwa Research Foundation to combine iDEP with Ultrafiltration (joint with CDC and Contra Costa Water District)
- Served as technical and project lead for the desalination of water using clathrate hydrates
- Served as SNL-CA project lead for the genetic engineering of oxidoreductase enzymes for power generation applications based on simple sugar oxidation
- Developed and utilized protocols for modifying polymeric substrates to interrogate whole cell-surface interactions as a function of surface treatment
- Coordinated the electroplating pipeline at SNL-CA for the development of nickel microfluidic replication tools
- Served as technical and project lead for the development of alternative desalination technologies that utilize clathrate hydrates
- Fabricated and functionalized polymeric surfaces for the selective adsorption of proteins for use in microarrays
- Synthesized, characterized, and developed immobilization techniques for a novel class of mixed metal oxide nanocrystalline photocatalysts
- Served as project and technical lead in the development, characterization, and utilization of a new class of cleavable surfactants for use in the synthesis of advanced materials
- Developed, designed, and fabricated polymeric microfluidic devices through injection molding and hot embossing for a variety of sensing and concentration applications
- Developed and synthesized various polymeric thin films and rigid mesophases for tamper indicating tags and seals

Tulane University 9/97 – 8/01
Graduate Student/Research Assistant

- Designed and conducted experiments for the synergistic synthesis of nanoscale and mesoscale advanced materials in a complex fluid environment
- Specialized in reverse micellar systems, organo- and organohydrogel synthesis and characterization, enzymatic free radical polymerization, templated synthesis of nanomaterials, ceramic-polymer composite materials, inorganic nanocrystals, quantum dot synthesis, and clathrate hydrate technology
- Trained to operate SEM, TEM, SANS, SAXS, AFM, EDS, FTIR, NMR, UV-VIS, GPC, HPLC, LS, XRD, TGA, PLM, ELISA, and SDS-PAGE

Dow Chemical Company, Summer Intern 6/96 – 9/96

- Developed and implemented pilot scale heat transfer apparatus, including the development and implementation of process control design parameters into software control program

United States Navy, E-5 3/88 - 8/93

- Nuclear Propulsion Operator – USS Carl Vinson
- Regularly supervised 10-20 people for maintenance, operation, and readiness teams at various duty stations

- Honorably discharged

ACTIVITIES/HONORS

- Outstanding Young Alumnus in Science and Engineering Award, Tulane University, 2009
- SAB Member, Allopartis
- SAC Member, West Coast Biorefinery, Pacific Ethanol
- Panelist and author for DOE BES Basic Research Needs Catalysis Workshop, August 2007, focused on Biomass and Biofuels
- Co-Chair of MRS Fall 2007 National Meeting Session (NN) on Peptide-Directed Materials
- Successfully nominated Prof. Brian Kirby of Cornell University for a Presidential Early Career Award in Science and Engineering, 2007
- Served on NSF CAREER Review Panel 2005 and 2006
- Served on DOE BES Proposal Review Panel 2006
- Served on User Proposal Review Panel, NIST NCNR 2005 and 2006
- Journal reviewer: *Analytical Chemistry, JACS, Langmuir, Science, Lab on a Chip, Electrophoresis, Bioanalytical and Analytical Chemistry, Chem Reviews, Chem Communications*
- Member, Institutional Biosafety Committee for Sandia National Laboratories, 2004-2006
- Successfully nominated Prof. William King of University of Illinois for Presidential Early Career Award in Science and Engineering, 2005
- Co-Chair of IMECE Conference Session on Nanofabrication, 2005
- Recipient, Sandia Team Employee Recognition Award 2005
- Sandia National Laboratories Academic Recruiter 2004-
- Invited instructor in educational outreach program at the Academy of Arts University, San Francisco, 2002
- Science bowl volunteer 2001-2002
- President, Tulane Graduate School Student Association, 2000-2001
- 1st Place 219th Annual ACS Colloids and Surfaces Poster Division, 2000
- Secretary, Tulane Graduate School Student Association, 1999-2000
- 1st Place 218th Annual ACS Colloids and Surfaces Poster Division, 1999
- Vice-President, Chemical Engineering Graduate Student Society, 1998
- OSHA Laboratory Safety Coordinator, 1998-2001
- Louisiana Board of Regents Fellowship, 1997-2001
- Dow Chemical Outstanding Junior in Chemical Engineering, 1996
- President, Tau Beta Pi Washington Alpha Chapter, 1996-1997
- American Chemical Society, Member 1999-present
- Tau Beta Pi, Member 1996-present
- American Institute of Chemical Engineers, Member 1996-present
- Neutron Scattering Society of America, 1999-present

PUBLICATIONS

1. Singh, Seema; Simmons, Blake A.; Vogel, Kenneth P. **Visualization of biomass solubilization and cellulose regeneration during ionic liquid pretreatment of switchgrass.** *Biotechnology and Bioengineering*, 2009, 104(1), 68-75.

2. Pereira, Jose Henrique; Sapra, Rajat; Volponi, Joanne V.; Kozina, Carol L.; Simmons, Blake; Adams, Paul D. **Structure of endoglucanase Cel9A from the thermoacidophilic**

Alicyclobacillus acidocaldarius. *Acta Crystallographica, Section D: Biological Crystallography*, 2009, D65(8), 744-750.

3. Eizadora T. Yu, Frank J. Zendejas, Pamela D. Lane, Sara Gaucher, Blake A. Simmons and Todd W. Lane. **Triacylglycerol accumulation and profiling in the model diatoms *Thalassiosira pseudonana* and *Phaeodactylum tricornutum* (Baccilariophyceae) during starvation**, Journal of Applied Phycology, online January 2009

4. Kent, Michael; Murton, Jaclyn; Zendejas, Frank; Tran, Huu; Simmons, Blake; Satija, Sushil; Kuzmenko, Ivan. **Nanosilica Formation At Lipid Membranes Induced by the Parent Sequence of a Silaffin Peptide**. *Langmuir*, 2009, 25(1), 305-310.

5. Simmons, Blake A.; Loque, Dominique L.; Blanch, Harvey W. **Next-generation biomass feedstocks for biofuel production**. *Genome Biology*, 2008, 9(12), 242.

6. Volponi, Joanne V.; Miller, M. Elizabeth; Simmons, Blake A. **Efficient attachment of native & deglycosylated glucose oxidase to Amberzyme oxirane polymeric support**. *Industrial Biotechnology*, **2008**, 4(3), 288-293.

7. Sabounchi, Poorya; Morales, Alfredo M.; Ponce, Pierre; Lee, Luke P.; Simmons, Blake A.; Davalos, Rafael V. **Sample concentration and impedance detection on a microfluidic polymer chip**. *Biomedical Microdevices*, **2008**, 10(5), 661-670

8. Blanch, Harvey W.; Adams, Paul D.; Andrews-Cramer, Katherine M.; Frommer, Wolf B.; Simmons, Blake A.; Keasling, Jay D. **Addressing the Need for Alternative Transportation Fuels: The Joint BioEnergy Institute.** *ACS Chemical Biology*, **2008**, 3(1), 17-20.

9. Davalos, Rafael V.; McGraw, Gregory J.; Wallow, Thomas I.; Morales, Alfredo M.; Krafcik, Karen L.; Fintschenko, Yolanda; Cummings, Eric B.; Simmons, Blake A. **Performance impact of dynamic surface coatings on polymeric insulator-based dielectrophoretic particle separators**. *Analytical and Bioanalytical Chemistry*, **2008**, 390(3), 847-855.

10. Bahr, D. F.; Reid, J. A.; Mook, W. M.; Bauer, C. A.; Stumpf, R.; Skulan, A. J.; Moody, N. R.; Simmons, B. A.; Shindel, M. M.; Allendorf, M. D. **Mechanical properties of cubic zinc carboxylate IRMOF-1 metal-organic framework crystals.** *Physical Review B: Condensed Matter and Materials Physics*, **2007**, 76(18), 184106/1-184106/7.

11. Greathouse, Jeffery A.; Cygan, Randall T.; Bradshaw, Robert W.; Majzoub, Eric H.; Simmons, Blake A. **Computational and spectroscopic studies of dichlorofluoroethane hydrate structure and stability.** *Journal of Physical Chemistry C*, **2007**, 111(45), 16787-16795.

12. Wallow, Thomas I.; Morales, Alfredo M.; Simmons, Blake A.; Hunter, Marion C.; Krafcik, Karen Lee; Domeier, Linda A.; Sickafoose, Shane M.; Patel, Kamlesh D.; Gardea, Andy. **Low-distortion, high-strength bonding of thermoplastic microfluidic devices employing case-II diffusion-mediated permeant activation**. *Lab on a Chip*, **2007**, 7(12), 1825-1831.

13. Eliason, M.T.; Charest, J.L.; Simmons, B.A.; Garcia, A.J.; King, W.P. **Nanoimprint fabrication of polymer cell substrates with combined microscale and nanoscale topography,** *Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures--Processing, Measurement, and Phenomena*, **2007**, 25(4), L31-L34.

14. Bauer, C.A., Timofeeva, T.V., Settersten, T.B., Patterson, B.D., Liu, V.H., Simmons, B.A., Allendorf, M.A., **Influence of Connectivity and Porosity on Ligand-Based Luminescence in Zinc Metal-Organic Frameworks**, *Journal of the American Chemical Society*, **2007**, 129(22), 7136-44.

15. Robinson, D.B.; Rognlien, J.L.; Bauer, C.A.; Simmons, B.A., **Dependence of amine-accelerated silicate condensation on amine structure,** *Journal of Materials Chemistry*, **2007**, 17(20), 2113-2119.

16. Bauer, C.A.; Robinson, D.B.; Simmons, B.A., **Silica particle formation in confined environments via bioinspired polyamine catalysis at near-neutral pH**, *Small*, **2007**, 3(1), 58-62.

17. Greathouse, J.A.; Cygan, R.T.; Simmons, B.A. **Vibrational spectra of methane clathrate hydrates from molecular dynamics simulation**, *The Journal of Physical Chemistry B*, **2006**, 110(13), 6428-6431.

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20. Lee, E.S.; Robinson, D.R.; Munoz, C.M.; Simmons, B.A.; Ellis, C.R.B.; Davalos, R.V. **Microfluidic electroporation of robust 10-micron vesicles for manipulation of picoliter volumes**, *Bioelectrochemistry*, **2006**, 69, 117-125.

21. Charest, J.L.; Eliason, M.T.; Garcia, A.J.; King, W.P.; Talin, A.A.; Simmons, B.A. **Polymer Cell Culture Substrates with combined Nanotopographical Patterns and Micropatterned Chemical Domains**, *Journal of Vacuum Science and Technology:B*, **2005**, 23, 3011-3014. [Republished online in the *Virtual Journal of Nanoscience & Nanotechnology*, **2005**, 12 (25).]

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24. McElhanon, J.R.; Zifer, T.; Jamison, G.M., Long, T.P.; Kline, S.R.; Loy, D.A.; Wheeler, D.R.; Simmons, B.A. **Thermally Cleavable Surfactants based on Furan + Maleimide Diels-Alder Adducts**, *Langmuir*, **2005**, 21(8), 3259-3266

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32. Simmons, B.; Agarwal, V.; Bose, A.; McPherson, G.; John, V. **Small-angle neutron scattering study of mixed AOT and lecithin reverse micelles**, *Langmuir*, **2002**, 18, 8345-8349.

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37. Simmons, B.; Taylor, C.; Landis, F.; John, V.; McPherson, G.; Schwartz, D.; Moore, R. **Microstructure determination of AOT + phenol organogels utilizing small-angle x-ray scattering and atomic force microscopy**, *J. Am. Chem. Soc.*, **2001**, 123(10), 2414-2421.

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39. Li, S.; John, V.; Irvin, G.; Simmons, B.; McPherson, G.; Zhou, W. **The use of organic templates to develop biomimetic chain structures of magnetic nanoparticles** *J. of Appl. Phys***., 2000**, 87(9), 6211-6213.

BOOK CHAPTERS

1. McGraw, Gregory J.; Kanouff, Michael; Ceremuga, Joseph T.; Davalos, Rafael V.; Lapizco-Encinas, Blanca H.; Mela, Petra; Shediac, Renee; Brazzle, John D.; Hachman, John T.; Fiechtner, Gregory J.; Cummings, Eric B.; Fintschenko, Yolanda; Simmons, Blake A.. **A comparison of insulator-based dielectrophoretic devices for the monitoring and separation of waterborne pathogens as a function of microfabrication technique.** ACS Symposium Series (2007), 980(Antiterrorism and Homeland Defense), 133-157, 15 plates.

2. Simmons, B.; Liu, L.; John, V.; Taylor, C.; Schwartz, D.; McPherson, G.; Bose, A.; Agarwal, V. **Templating nanostructure through the self-assembly of surfactants,** *Synthesis, Functionalization and Surface Treatment of Nanoparticles*, **2003**, 51-65, Editor: M.I. Baraton, Publisher: American Scientific Publishers

3. Li, S.; Liu, L.; Simmons, B.; Irvin, G.; Ford, C.; John, V.; McPherson, G.; Bose, A.; Johnson, P.; Zhou, W.; O'Connor, C. **Amphiphilic templates in the synthesis of nanostructure composites – from particles to extended structures**, *NATO Science Series II – Functional Gradient Materials and Surface Layers Prepared by Fine Particles Technology*, **2001**, 16, 61-67.

4. Irvin, G.; Banerjee, S.; Premachandran, R.; Simmons, B.; Li, S.; John, V.; McPherson, G.; Akkara, J.; Kaplan, D.; Zhou, W. **The use of surfactant self-assembly in the enzymatic synthesis of novel polymers**, *Surfactant Science Series*, **2001**, 100, 515-524.

5. Irvin, G.; Li, S.; Simmons, B.; John, V.; McPherson, G. **Crystal growth restriction through clathrate hydrate formation**, *Advances in Crystal Growth Inhibition Technologies*, **2001**, 255-265.

6. Irvin, G.; Li, S.; Simmons, B.; John, V.; McPherson, G.; Max, M.; Pellenburg, R. **Control of gas hydrate formation using surfactant systems – underlying concepts and new applications**, *Annals of the New York Academy of Sciences*, **2000**, 912, 515-526.

PATENTS

1. McElhanon, James R.; Jamison, Gregory M.; Long, Timothy M.; Loy, Douglas A.; Rahimian, Kamyar; Simmons, Blake A.; Staiger, Chad L.; Wheeler, David R.; Zifer, Thomas. **Preparation of thermally cleavable surfactants without deprotonation.** U.S. (2008), 12pp., Cont.-in-part of U.S. Ser. No. 866,475.

2. Simmons, Blake A.; Volponi, Joanne V.; Ingersoll, David; Walker, Andrew. **Conversion of sucrose to β-D-glucose using three-stage immobilized enzyme process.** U.S. (2007), 7264962

3. Mcelhanon, James R.; Simmons, Blake A.; Zifer, Thomas; Jamison, Gregory M.; Loy, Douglas A.; Rahimian, Kamyar; Long, Timothy M.; Wheeler, David R.; Staiger, Chad L. **Thermally cleavable surfactants based on furan-maleimide Diels-Alder adducts, scheme for Gemini surfactant, and surfactant manufacture.** U.S. (2006), 7022861

4. Cummings, E.B.; Even, W.R.; Dentinger, P.M.; Simmons, B.A. **Tamper-Indicating Barcode and Method** U.S. (2005), 6869015

PATENT APPLICATIONS

1. Simmons, Blake A.; Mcgraw, Gregory J.; Salmi, Allen; Fiechtner, Gregory J.; Cummings, Eric B.; Fintschenko, Yolanda. **Methods and devices for high-throughput dielectrophoretic concentration**. U.S. Pat. Appl. Publ. (2006), 22pp. CODEN: USXXCO US 2006201868

2. Chirica, Gabriela S.; Renzi, Ronald F.; Simmons, Blake A.. **Microliter scale solid phase extraction devices**. U.S. Pat. Appl. Publ. (2006), 25 pp. CODEN: USXXCO US 2006163143

3. Pathak, Srikant; Simmons, Blake; Dentinger, Paul M. **Lithographic method for attaching biological cells to a solid substrate using a small molecule linker.** U.S. Pat. Appl. Publ. (2005), 12 pp. CODEN: USXXCO US 2005136538

4. Simmons, Blake A.; Crocker, Robert; Dentinger, Paul Michael; Hunter, Marion Catherine; Patel, Kamlesh; Sala, Jonathan. **Polymerization welding and application to microfluidic devices.** U.S. Pat. Appl. Publ. (2005), 16 pp. CODEN: USXXCO US 2005100712

5. Rucker, Victor C.; Shediac, Renee; Simmons, Blake A.; Havenstrite, Karen L. **Reactive ion etched substrates with immobilized specific binding agents and methods of making and using them.** U.S. Pat. Appl. Publ. (2006), 21 pp. CODEN: USXXCO US 2006141484

6. Cummings, Eric B.; Fintschenko, Yolanda; Simmons, Blake. **Dielectrophoresis device and method having non-uniform arrays for manipulating particles.** U.S. Pat. Appl. Publ. (2004), 10 pp., Cont.-in-part of U.S. Ser. No. 176,322.

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SELECTED CONFERENCE PROCEEDINGS

1. Kent, M. S.; Murton, J. K.; Satija, S.; Kuzmenko, I.; Simmons, B. A. **Nanosilica formation at lipid membranes induced by silaffin peptides**. Materials Research Society Symposium Proceedings (2009), 1187.

2. Kent, Michael S.; Murton, Jaclyn K.; Dibble, Dean C.; Zendejas, Frank; Tran, Huu M.; Simmons, Blake A.; Banuelos, J. L.; Urquidi, Jacob; Hjelm, Rex P**. SANS study of enzymatic digestion of cellulose.** PMSE Preprints (2009), 101 904.

3. Xie, He; Zendejas, Frank; Tran, Huu M.; Simmons, Blake A.; Debusschere, Bert J.; Hickner, Michael A. **Chemical modification and transport properties of nanoporous membranes**. Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2008), 49(2), 513-514.

4. Doty, F. P.; Bauer, C. A.; Grant, P. G.; Simmons, B. A.; Skulan, A. J.; Allendorf, M. D. **Radioluminescence and radiation effects in metal organic framework materials.** Proceedings of SPIE-The International Society for Optical Engineering, **2007**, 6707(Penetrating Radiation Systems and Applications VIII), 67070F/1-67070F/8.

5. Wilson, Tiffany M. S.; Doty, F. P.; Chinn, Douglas A.; King, Michael J.; Simmons, Blake A.. **Order and charge collection correlations in organic materials for neutron detection**. Proceedings of SPIE-The International Society for Optical Engineering, **2007**, 6707(Penetrating Radiation Systems and Applications VIII), 670710/1-670710/8.

6. Bradshaw, Robert W.; Simmons, Blake A.; Majzoub, Eric H.; Clift, W. Miles; Dedrick, Daniel E. **Clathrate Hydrates for Production of Potable Water.** Materials Research Society Symposium Proceedings (2006), 930E(Materials Science of Water Purification), No pp. given, Paper #: 0930-JJ01-06.

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8. Greg J. McGraw, Rafael V. Davalos, John D. Brazzle, John T. Hachman, Marion C. Hunter, Jeffery M. Chames, Gregory J. Fiechtner, Eric B. Cummings, Yolanda Fintschenko, Blake A. Simmons **Polymeric microfluidic devices for the monitoring and separation of water-borne pathogens utilizing insulative dielectrophoresis**, Proceedings of SPIE-The International Society for Optical Engineering, **2005**, 5715, 59-68.

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13. Lee, E.S.; Munoz, C.M.; Simmons, B.A.; Ellis, C.R.B.; Davalos, R.V. **Feasibility study on the use of temperature-dependent liposomes for variable concentration profiles in drug delivery applications**, Proceedings of IMECE04, 2004 ASME International Mechanical Engineering Congress, Nov. 2004

14. Liu, L.; Ford, C.; Singh, M.; Simmons, B.; Li, S.; John, V. T.; McPherson, G. L.; Bose, A.; Sennett, M. **Surfactant mesophases and the templated synthesis of polymer-ceramic nanocomposites.** *Proceedings of the American Society for Composites*, Technical Conference, **2001**,16th, 549-555.

15. Cummings, E.B.; Fiechtner, G.J.; Singh, A.K.; Simmons, B.A.; Fintschenko, Y.; Lapizco-Encinas, B.H. **Continuous Streaming Dielectrophoretic Filter/Concentrators**, *MicroTAS 2003*, **2003**, 41-44.

16. Fintschenko, Y.; Simmons, B.A.; Lapizco-Encinas, B.H.; Cummings, E.B. **Insulating Post Dielectrophoresis for the Selective Concentration of Bacteria**, *MicroTAS 2003*, **2003**, 65-68.

17. Lapizco-Encinas, B.H.; Simmons, B.A.; Cummings, E.B.; Fintschenko, Y. **High-Throughput Electrodeless Dielectrophoresis of Viruses in Polymeric Microdevices**, *MicroTAS 2003*, **2003**, 607-610.

SELECTED PRESENTATIONS/CONFERENCES

1. Bauer, Christina A.; Kinnibrugh, Tiffany L.; Timofeeva, Tatiana V.; Doty, F. P.; Simmons, Blake A.; Allendorf, Mark D. **Tuning linker-based luminescence in metal-organic frameworks.** Abstracts of Papers, 235th ACS National Meeting, New Orleans, LA, United States, April 6-10, 2008 (2008), INOR-894.

2. Bauer, Christina A.; Simmons, Blake A.. **Bioinspired fluorescent and metal nanoparticle-doped silica particles.** Abstracts of Papers, 235th ACS National Meeting, New Orleans, LA, United States, April 6-10, 2008 (2008), INOR-340.

3. Robinson, David B.; Chae, Weon-Sik; Braun, Paul V.; Simmons, Blake A**.. Electrochemical fabrication and characterization of hierarchically porous supercapacitors.** Abstracts of Papers, 235th ACS National Meeting, New Orleans, LA, United States, April 6-10, 2008 (2008), COLL-487.

4. Robinson, David; Simmons, Blake A.; Zuckermann, Ronald N. **Toward artificial diatoms: Structure-function studies of oligoamine-induced silica condensation.** Abstracts of Papers, 234th ACS National Meeting, Boston, MA, United States, August 19-23, 2007

5. (Invited) Simmons, Blake A.; McElhanon, James R.; Jamison, Gregory M.; Cruz, Evelyn; Rahimian, Kamyar; Zifer, Thomas; Yun, Steven; Wheeler, David R.; Loy, Douglas A. **Utilization of thermally cleavable surfactants based on furan and maleimide Diels-Alder adducts as removable templates.** Abstracts of Papers, 231st ACS National Meeting, Atlanta, GA, United States, March 26-30, 2006

6. Schroeder, Felicitas; Hermes, Stephan; Bauer, Christina A.; Skulan, Andrew J.; Simmons, Blake A.; Allendorf, Mark D.; Woell, Christof; Fischer, Roland A. **Thin films of metal organic framework compounds: Design and characterization of new functional surfaces.** Abstracts of Papers, 231st ACS National Meeting, Atlanta, GA, United States, March 26-30, 2006

7. Bauer, Christina A.; Schroeder, Felicitas; Skulan, Andrew J.; Hermes, Stephan; Talin, Albert A.; Anderson, Richard J.; Fischer, Roland A.; Simmons, Blake A.; Allendorf, Mark D. **Electronic and luminescent properties of metal-organic frameworks: Toward gas sensors.** Abstracts of Papers, 231st ACS National Meeting, Atlanta, GA, United States, March 26-30, 2006

8. (Invited) Simmons, Blake A. **Design, fabrication, and testing of polymer-based microfluidic devices for pathogen monitoring.** 25th Golden Gate Polymer Forum, October 24, 2005

9. (Invited) Simmons, Blake A.; Fintschenko, Yolanda; Cummings, Eric B.; Davalos, Rafael; Fiechtner, Gregory J.; McGraw, Gregory. **Polymeric substrates for high-throughput separation and concentration of biological agents.** 230th ACS National Meeting, Washington, DC, United States, Aug. 28-Sept. 1, 2005

10. (Invited) Simmons, Blake **Summary of Nano-Bio Activities ad Applications in Homeland Security at Sandia National Laboratories**, The Technology Cooperation Program of NATO Workshop on Counter-Terrorism, Southampton, United Kingdom, July 12, 2005

11. (Invited) Simmons, Blake; Lapizco-Encinas, B.H.; Cummings, E.; Fiechtner, G.; Shediac, R.; Chames, J.; Hachman, J.; Fintschenko, Y. **Development and testing of polymer-based microfluidic devices for the selective concentration of water-borne pathogens**, University of Illinois, March 2005.

12. (Invited) Simmons, Blake; Lapizco-Encinas, B.H.; Cummings, E.; Fiechtner, G.; Shediac, R.; Chames, J.; Hachman, J.; Fintschenko, Y. **Development and testing of polymer-based microfluidic devices for the selective concentration of water-borne pathogens**, Georgia Institute of Technology, April 2005.

13. Simmons, Blake; Lapizco-Encinas, B.H.; Cummings, E.; Fiechtner, G.; Shediac, R.; Chames, J.; Hachman, J.; Fintschenko, Y. **Polymer-based microfluidic devices for the selective concentration of water-borne pathogens**, Micro-TAS 2004, September 30, 2004, Malmö, Sweden.

14. Boyle, Timothy J.; Bunge, Scott D.; Simmons, Blake A.; Clem, Paul; Headley, Thomas J. **Synthesis of metal core ceramic shell nanoparticle.** Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004.

15. Simmons, Blake; Lapizco-Encinas, B.H.; Cummings, E.; Fiechtner, G.; Shediac, R.; Chames, J.; Hachman, J.; Fintschenko, Y. **Polymeric insulative dielectrophoresis of water-borne pathogens**, ACS Spring 2004, Anaheim, CA.

16. Simmons, Blake; McElhanon, James; Zifer, Tom; Jamison, Greg; Long, Timothy **Cleavable surfactants based on furan-maleimide Diels-Alder adducts**, ACS Spring 2004 (invited), Anaheim, CA.

17. (Invited) Simmons, Blake; Domeier, Linda; Morales, Alf; Sala, Jonathan **Polymeric microfluidics replicated through injection molding and hot embossing**, Iprime Workshop, University of Minnesota, January 7, 2004

18. Long, Timothy M.; Simmons, Blake A.; McElhanon, James R.; Wheeler, David R.; Loy, Douglas A.; Jamison, Gregory M. **Metathesis depolymerization for removable surfactant templates.** Abstracts of Papers, 226th ACS National Meeting, New York, NY, United States, September 7-11, 2003

19. Singh, M.; Liu, L.; Simmons, B.; DeKee, D.; John, Vijay; Bose, Arijit. **Use of lipid self-assembly to direct flow-induced polymer synthesis for pharmaceutical applications.** Abstracts of Papers, 222nd ACS National Meeting, Chicago, IL, United States, August 26-30, 2001.

20. Simmons, B.; Irvin, G.; Agarwal, V.; Bose, A.; John, V.; McPherson, G.; Balsara, N **Microstructure Determination of a Surfactant-Based Rigid Mesophase,** Poster, Gordon Research Conference on Supramolecular Self-Assembly, Connecticut College, July 2001.

21. Simmons, B.; Liu, L.; Li, S.; Agarwal, V.; John, V.; Bose, A.; McPherson, G. **Synthesis of Novel Materials in Surfactant Based Systems**, Poster, Gordon Research Conference on Supramolecular Self-Assembly, Connecticut College, July 2001

22. Simmons, B.; Taylor, C.; Landis, F.; John, V.; McPherson, G.; Schwartz, D.; Moore, R. **Microstructure Determination of a Novel Phenol + AOT Organogel,** Presentation, Abstracts of Papers, 75th ACS Colloids and Surface Science Division Conference, Pittsburgh, PA, June 2001.

23. Liu, L.; Li, S; Simmons, B.; John, V.; McPherson, G.; Bose, A; Zhou, W. **Templated Materials Synthesis in a Rigid Surfactant Based Mesophase**, Presentation, Abstracts of Papers, 75th ACS Colloids and Surface Science Division Conference, Pittsburgh, PA, June 2001.

24. Simmons, B.; Irvin, G.; Agarwal, V.; Bose, A.; John, V.; McPherson, G.; Balsara, N **SANS Investigation of a Rigid Surfactant Based Bicontinuous Mesophase,** Presentation, Abstracts of Papers, 75th ACS Colloids and Surface Science Division Conference, Pittsburgh, PA, June 2001.

25. Simmons, Blake; John, Vijay; Balsara, Nitash; Bose, Arijit; Landis, Forrest; Moore, Robert. **Transformations from microemulsions to organogels and organohydrogels: Fundamental characterization and applications to templated materials synthesis.** Abstr. Pap. - Am. Chem. Soc. (2000), 219th COLL-053 Poster Division - Winner.

26. Li, Sichu; Irvin, G.; Simmons, Blake; John, Vijay T.; McPherson, Gary; O'Connor, Charles J.; Zhou, Weilie. **Organogel formed by bridging reverse micelles through hydrogen bonding: Characterization and applications to magneto-responsive materials.** Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March 26-30, 2000 Poster Division.

27. John, Vijay; Li, Sichu; Irvin, Glen; Simmons, Blake; McPherson, Gary; Akkara, Joseph; O'Connor, Charles. **Transformations from inverse micelles to rigid gels in surfactant systems: Fundamental characterization and applications to nanostructured materials synthesis.** Book of Abstracts, 218th ACS National Meeting, New Orleans, Aug. 22-26 (1999), COLL-148 Poster Division – Winner.

MENTORING

Staff: Seema Singh, David Robinson, Rajat Sapra, Masood Hadi, Dean Dibble, Huu Tran, Brad Holmes

Post-docs: Ron Houk (mentor), Frank Zendejas (mentor), Christina Bauer (mentor), Swapnil Chhabra (co-mentor), David Robinson (LTE; co-mentor)

Student Interns: Alison Harris, Cindy Juarez, Kaycie Butler, Trenton Lynch (CU), Hunter Moore (Ga. Tech.), David Safranski (Ga. Tech.), Yusef Syed (Cornell), Kevin Luongo (USF), Jonathan Sala (UCB), Noble Woo (Cornell), Andrew Larsen (Tulane), Eric Goods (UCSD), Aaron Lee (UCB), Matthew Sprague (Cal. Tech.), Thomas Cauley (UCB), Gregory McGraw (Cornell), Joseph Charest (Ga. Tech.), Marcus Eliason (Ga. Tech.), Jessica Lam (MIT), Julia Crawford-Dibble (UCSD), Elizabeth Costa (UCSD), Jessica Leung (UCB), Brita Mittal (MIT), Paul Dossa (MIT)

Low Carbon Fuel Standard
Expert Workgroup Member Application Form
Please submit a CV along with this form

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Years of Relevant Experience: 8

Comments: I currently manage the Biomass Science and Conversion Technology Department at Sandia National Laboratories in Livermore, CA and am also one of the co_PI's of the $135M DOE funded Joint BioEnergy Institute (JBEI). I have over 8 years of experience with biofuels and have been engaged on the CA LCFS for the past two years. I have experience with the GREET model and a techno-economic model of cellulosic biorefineries we have established at JBEI.

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