

C. JEFFREY BRINKER

A. Professional Preparation

Institution	Major/Area	Degree & Year
Rutgers University, New Brunswick, NJ	Ceramic Science	B.S., 6/72 (with High Honors).
Rutgers University, New Brunswick, NJ	Ceramic Science	M.S., 12/75
Rutgers University, New Brunswick, NJ	Ceramic Science	Ph.D., 12/78; Thesis Topic: "Alkali Metal Corrosion of Glass"

B. Current Appointments

<u>Distinguished and Regent's Professor</u> Departments of Chemical and Nuclear Engineering, Chemistry, Molecular Genetics and Microbiology, Co- Director Center for Micro-Engineered Materials The University of New Mexico, Albuquerque, NM. 87131; 505- 277-6266 (office); jbrinker@unm.edu	<u>Sandia Fellow</u> Science and Technology Office Sandia National Laboratories, 1001 University Blvd SE, Albuquerque, NM 87106. 505-272-7627 (office); 505-259-4182 (mobile) cjbrink@sandia.gov
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C. Appointments and Affiliations:

2010 – current: Member UNM Cancer Center

2008 - current: Distinguished Professor of Chemical and Biological Engineering and Molecular Genetics and Microbiology, the University of New Mexico (UNM), Albuquerque, NM. Highest UNM distinction. Research activities include self- and directed-assembly of 2D and 3D nanoscale materials and assemblies, molecular templating, atomic layer deposition, nano/micro/macro integration, and bio/nano interfaces.

2006-Current: Distinguished Affiliate Scientist at the Center for Integrated Nanotechnologies (CINT), a Department of Energy/Office of Science Nanoscale Science Research Center (NSRC).

2006-Current: Regent's Professor of Chemical and Biological Engineering and Molecular Genetics and Microbiology, UNM. Co-developed new graduate curriculum in nanoscience and Microsystems. Led statewide NSF EPSCOR program on nanoscience and nanotechnology.

2003-Current, Laboratory Fellow (1 of 4 among 10K employees), Sandia National Laboratories (SNL), Albuquerque, NM. Serves as resource for and provides guidance to SNL materials science and nanotechnology programs.

1999 – 2006, Professor of Chemistry and Chemical and Nuclear Engineering, UNM

1999 – 2003, Senior Scientist, Chemical Synthesis and Nanomaterials Department, SNL

1991 – 1999, Distinguished National Laboratory Professor of Chemistry and Chemical and Nuclear Engineering, UNM

1991 – 1998, Distinguished Member of the Technical Staff, Direct Fabrication Dept, SNL

1979 – 1991, Member of the Technical Staff, Chemistry and Ceramics Department, SNL

D. Highly Cited Books, Publications, Patents – Citations > 100 (*h-index* = 80, *Google Scholar*)

1. Brinker, C. J.; Scherer, G. W.: *Sol-Gel Science: The Physics and Chemistry of Sol-Gel Processing*; Academic Press, Inc: San Diego, CA, 1990. *12476 citations*.
2. Brinker, C. J.; Lu, Y. F.; Sellinger, A.; Fan, H. Y.: Evaporation-induced self-assembly: Nanostructures made easy. *Advanced Materials* **1999**, *11*, 579-585. *1638 citations*.
3. Lu, Y. F.; Ganguli, R.; Drewien, C. A.; Anderson, M. T.; Brinker, C. J.; Gong, W. L.; Guo, Y. X.; Soyez, H.; Dunn, B.; Huang, M. H.; Zink, J. I.: Continuous formation of supported cubic and hexagonal mesoporous films by sol gel dip-coating. *Nature* **1997**, *389*, 364-368. *1382 citations*.
4. Lu, Y. F.; Fan, H. Y.; Stump, A.; Ward, T. L.; Rieker, T.; Brinker, C. J.: Aerosol-assisted self-assembly of mesostructured spherical nanoparticles. *Nature* **1999**, *398*, 223-226. *853 citations*.

5. Raman, N. K.; Anderson, M. T.; Brinker, C. J.: Template-based approaches to the preparation of amorphous, nanoporous silicas. *Chemistry of Materials* **1996**, *8*, 1682-1701. 838 citations.
6. Brinker, C. J.: Hydrolysis and Condensation of Silicates - Effects of Structure. *Journal of Non-Crystalline Solids* **1988**, *100*, 31-50. 757 citations.
7. Brinker, C. J.; Keefer, K. D.; Schaefer, D. W.; Ashley, C. S.: Sol-Gel Transition in Simple Silicates. *Journal of Non-Crystalline Solids* **1982**, *48*, 47-64. 669 citations.
8. Sellinger, A.; Weiss, P. M.; Nguyen, A.; Lu, Y. F.; Assink, R. A.; Gong, W. L.; Brinker, C. J.: Continuous self-assembly of organic-inorganic nanocomposite coatings that mimic nacre. *Nature* **1998**, *394*, 256-260. 530 citations.
9. Brinker, C. J.; Keefer, K. D.; Schaefer, D. W.; Assink, R. A.; Kay, B. D.; Ashley, C. S.: Sol-Gel Transition in Simple Silicates. II. *Journal of Non-Crystalline Solids* **1984**, *63*, 45-59. 494 citation.
10. Brinker, C. J.; Scherer, G. W.: Sol to Gel to Glass: I. Gelation and Gel Structure. *Journal of Non-Crystalline Solids* **1985**, *70*, 301-322. 488 citations.
11. Lu, Y. F.; Yang, Y.; Sellinger, A.; Lu, M. C.; Huang, J. M.; Fan, H. Y.; Haddad, R.; Lopez, G.; Burns, A. R.; Sasaki, D. Y.; Shelnett, J.; Brinker, C. J.: Self-assembly of mesoscopically ordered chromatic polydiacetylene/silica nanocomposites. *Nature* **2001**, *410*, 913-917. 473 citations.
12. Fan, H. Y.; Yang, K.; Boye, D. M.; Sigmon, T.; Malloy, K. J.; Xu, H. F.; Lopez, G. P.; Brinker, C. J.: Self-assembly of ordered, robust, three-dimensional gold nanocrystal/silica arrays. *Science* **2004**, *304*, 567-571. 452 citations.
13. Lu, Y. F.; Fan, H. Y.; Doke, N.; Loy, D. A.; Assink, R. A.; LaVan, D. A.; Brinker, C. J.: Evaporation-induced self-assembly of hybrid bridged silsesquioxane film and particulate mesophases with integral organic functionality. *Journal of the American Chemical Society* **2000**, *122*, 5258-5261. 451 citations.
14. Fan, H. Y.; Lu, Y. F.; Stump, A.; Reed, S. T.; Baer, T.; Schunk, R.; Perez-Luna, V.; Lopez, G. P.; Brinker, C. J.: Rapid prototyping of patterned functional nanostructures. *Nature* **2000**, *405*, 56-60. 422 citations.
15. Ashley, C. E.; Carnes, E. C.; Phillips, G. K.; Padilla, D.; Durfee, P. N.; Brown, P. A.; Hanna, T. N.; Liu, J.; Phillips, B.; Carter, M. B.; Carroll, N. J.; Jiang, X.; Dunphy, D. R.; Willman, C. L.; Petsev, D. N.; Evans, D. G.; Parikh, A. N.; Chackerian, B.; Wharton, W.; Peabody, D. S.; Brinker, C. J.: The targeted delivery of multicomponent cargos to cancer cells by nanoporous particle-supported lipid bilayers. *Nat Mater* **2011**, *10*, 389-397. 396 citations. (COVER with commentary: Irvine, D. J., One nanoparticle, one kill. *Nature Materials News & Views* **2011**, *10*, 342).
16. Brinker, C. J.; Hurd, A. J.; Schunk, P. R.; Frye, G. C.; Ashley, C. S.: Review of Sol-Gel Thin-Film Formation. *Journal of Non-Crystalline Solids* **1992**, *147*, 424-436. 387 citations.
17. Brinker, C. J.; Frye, G. C.; Hurd, A. J.; Ashley, C. S.: Fundamentals of Sol-Gel Dip Coating. *Thin Solid Films* **1991**, *201*, 97-108. 378 citations.
18. Song, Y. J.; Yang, Y.; Medforth, C. J.; Pereira, E.; Singh, A. K.; Xu, H. F.; Jiang, Y. B.; Brinker, C. J.; van Swol, F.; Shelnett, J. A.: Controlled synthesis of 2-D and 3-D dendritic platinum nanostructures. *Journal of the American Chemical Society* **2004**, *126*, 635-645. 296 citations.
19. Bhatia, R. B.; Brinker, C. J.; Gupta, A. K.; Singh, A. K.: Aqueous sol-gel process for protein encapsulation. *Chemistry of Materials* **2000**, *12*, 2434-2441. 291 citations.
20. Liu, N. G.; Dunphy, D. R.; Atanassov, P.; Bunge, S. D.; Chen, Z.; Lopez, G. P.; Boyle, T. J.; Brinker, C. J.: Photoregulation of mass transport through a photoresponsive azobenzene-modified nanoporous membrane. *Nano Letters* **2004**, *4*, 551-554. 243 citations.
21. Fan, H. Y.; Leve, E. W.; Scullin, C.; Gabaldon, J.; Tallant, D.; Bunge, S.; Boyle, T.; Wilson, M. C.; Brinker, C. J.: Surfactant-assisted synthesis of water-soluble and biocompatible semiconductor quantum dot micelles. *Nano Letters* **2005**, *5*, 645-648. 231 citations.

22. Bein, T.; Brown, K.; Frye, G. C.; Brinker, C. J.: Molecular-Sieve Sensors for Selective Detection at the Nanogram Level. *Journal of the American Chemical Society* **1989**, *111*, 7640-7641. 224 citations.
23. Tsai, C. Y.; Tam, S. Y.; Lu, Y. F.; Brinker, C. J.: Dual-layer asymmetric microporous silica membranes. *Journal of Membrane Science* **2000**, *169*, 255-268. 223 citations.
24. Brinker, C. J.; Sehgal, R.; Hietala, S. L.; Deshpande, R.; Smith, D. M.; Loy, D.; Ashley, C. S.: Sol-Gel Strategies for Controlled Porosity Inorganic Materials. *Journal of Membrane Science* **1994**, *94*, 85-102. 212 citations.
25. Doshi, D. A.; Huesing, N. K.; Lu, M. C.; Fan, H. Y.; Lu, Y. F.; Simmons-Potter, K.; Potter, B. G.; Hurd, A. J.; Brinker, C. J.: Optically, defined multifunctional patterning of photosensitive thin-film silica mesophases. *Science* **2000**, *290*, 107-111. 193 citations.
26. Raman, N. K.; Brinker, C. J.: Organic Template Approach to Molecular-Sieving Silica Membranes. *Journal of Membrane Science* **1995**, *105*, 273-279. 188 citations.
27. Tarn, D.; Ashley, C.E.; Xue, M.; Carnes, E.C.; Zink, J.I.; Brinker, C.J.: Mesoporous Silica Nanoparticle Nanocarriers: Biofunctionality and Biocompatibility. *Acc. Chem. Res.* **46**(3), 792-801. 180 citations.
28. *Better Ceramics Through Chemistry, Proceedings of the Materials Research Society Spring Meeting*; Brinker, C. J.; Clark, D. E.; Ulrich, D. R., Eds.; North-Holland: Albuquerque, NM, 1984. 178 citations.
29. Brinker, C. J.; Kirkpatrick, R. J.; Tallant, D. R.; Bunker, B. C.; Montez, B.: NMR Confirmation of Strained Defects in Amorphous Silica. *Journal of Non-Crystalline Solids* **1988**, *99*, 418-428. 177 citations.
30. Liu, J. W.; Stace-Naughton, A.; Jiang, X. M.; Brinker, C. J.: Porous Nanoparticle Supported Lipid Bilayers (Protocells) as Delivery Vehicles. *Journal of the American Chemical Society* **2009**, *131*, 1354-1355. 175 citations.
31. Doshi, D. A.; Gibaud, A.; Goletto, V.; Lu, M. C.; Gerung, H.; Ocko, B.; Han, S. M.; Brinker, C. J.: Peering into the self-assembly of surfactant templated thin-film silica mesophases. *Journal of the American Chemical Society* **2003**, *125*, 11646-11655. 165 citations.
32. Prakash, S. S.; Brinker, C. J.; Hurd, A. J.: Silica Aerogel Films at Ambient-Pressure. *Journal of Non-Crystalline Solids* **1995**, *190*, 264-275. 164 citations.
33. Truesdell, R.; Mammoli, A.; Vorobieff, P.; van Swol, F.; Brinker, C. J.: Drag reduction on a patterned superhydrophobic surface. *Physical Review Letters* **2006**, *97*. 163 citations.
34. Gogte, S.; Vorobieff, P.; Truesdell, R.; Mammoli, A.; van Swol, F.; Shah, P.; Brinker, C. J.: Effective slip on textured superhydrophobic surfaces. *Physics of Fluids* **2005**, *17*, 51701. 160 citations.
35. Bailey, J. K.; Brinker, C. J.; Mecartney, M. L.: Growth Mechanisms of Iron-Oxide Particles of Differing Morphologies from the Forced Hydrolysis of Ferric-Chloride Solutions. *Journal of Colloid and Interface Science* **1993**, *157*, 1-13. 155 citations.
36. Brinker, C. J.; Hurd, A. J.: Fundamentals of Sol-Gel Dip-Coating. *Journal De Physique III* **1994**, *4*, 1231-1242. 149 citations.
37. Gibaud, A.; Grosso, D.; Smarsly, B.; Baptiste, A.; Bardeau, J. F.; Babonneau, F.; Doshi, D. A.; Chen, Z.; Brinker, C. J.; Sanchez, C.: Evaporation-controlled self-assembly of silica surfactant mesophases. *Journal of Physical Chemistry B* **2003**, *107*, 6114-6118. 148 citations.
38. Brinker, C. J.; Ward, T. L.; Sehgal, R.; Raman, N. K.; Hietala, S. L.; Smith, D. M.; Hua, D. W.; Headley, T. J.: Ultramicroporous Silica-Based Supported Inorganic Membranes. *Journal of Membrane Science* **1993**, *77*, 165-179. 144 citations.

39. Liu, N. G.; Chen, Z.; Dunphy, D. R.; Jiang, Y. B.; Assink, R. A.; Brinker, C. J.: Photoresponsive nanocomposite formed by self-assembly of an azobenzene-modified silane. *Angewandte Chemie-International Edition* **2003**, *42*, 1731-1734. *134 citations.*
40. Brinker, C. J.; Scherer, G. W.; Roth, E. P.: Sol to Gel to Glass: II. Physical and Structural Evolution During Constant Heating Rate Experiments. *Journal of Non-Crystalline Solids* **1985**, *72*, 345-368. *130 citations.*
41. Liu, J. W.; Jiang, X. M.; Ashley, C.; Brinker, C. J.: Electrostatically Mediated Liposome Fusion and Lipid Exchange with a Nanoparticle-Supported Bilayer for Control of Surface Charge, Drug Containment, and Delivery. *Journal of the American Chemical Society* **2009**, *131*, 7567-7569. *127 citations.*
42. Brinker, C. J.; Tallant, D. R.; Roth, E. P.; Ashley, C. S.: Sol-Gel Transition in Simple Silicates: III. Structural Studies During Densification. *Journal of Non-Crystalline Solids* **1986**, *82*, 117-126. *125 citations.*
43. Yang, Y.; Lu, Y. F.; Lu, M. C.; Huang, J. M.; Haddad, R.; Xomeritakis, G.; Liu, N. G.; Malanoski, A. P.; Sturmayer, D.; Fan, H. Y.; Sasaki, D. Y.; Assink, R. A.; Shelnut, J. A.; van Swol, F.; Lopez, G. P.; Burns, A. R.; Brinker, C. J.: Functional nanocomposites prepared by self-assembly and polymerization of diacetylene surfactants and silicic acid. *Journal of the American Chemical Society* **2003**, *125*, 1269-1277. *122 citations.*
44. Deshpande, R.; Hua, D. W.; Smith, D. M.; Brinker, C. J.: Pore Structure Evolution in Silica-Gel During Aging/Drying. III. Effects of Surface-Tension. *Journal of Non-Crystalline Solids* **1992**, *144*, 32-44. *121 citations.*
45. Collins, J. P.; Schwartz, R. W.; Sehgal, R.; Ward, T. L.; Brinker, C. J.; Hagen, G. P.; Udovich, C. A.: Catalytic dehydrogenation of propane in hydrogen permselective membrane reactors. *Industrial & Engineering Chemistry Research* **1996**, *35*, 4398-4405. *118 citations.*
46. Wang, D. H.; Luo, H. M.; Kou, R.; Gil, M. P.; Xiao, S. G.; Golub, V. O.; Yang, Z. Z.; Brinker, C. J.; Lu, Y. F.: A general route to macroscopic hierarchical 3D nanowire networks. *Angewandte Chemie-International Edition* **2004**, *43*, 6169-6173. *117 citations.*
47. Fan, H. Y.; Bentley, H. R.; Kathan, K. R.; Clem, P.; Lu, Y. F.; Brinker, C. J.: Self-assembled aerogel-like low dielectric constant films. *Journal of Non-Crystalline Solids* **2001**, *285*, 79-83. *116 citations.*
48. Brinker, C. J.; Hurd, A. J.; Frye, G. C.; Ward, K. J.; Ashley, C. S.: Sol-Gel Thin-Film Formation. *Journal of Non-Crystalline Solids* **1990**, *121*, 294-302. *116 citations.*
49. Clark, T.; Ruiz, J. D.; Fan, H. Y.; Brinker, C. J.; Swanson, B. I.; Parikh, A. N.: A new application of UV-ozone treatment in the preparation of substrate-supported, mesoporous thin films. *Chemistry of Materials* **2000**, *12*, 3879-3884. *114 citations.*
50. Baca, H.K.; Ashley, C.E.; Carnes, E.C.; Lopez, D.; Flemming, J.; Dunphy, D.; Singh, S.; Chen, Z.; Liu, N.; Fan, H-Y.; Lopez, G.P.; Brozik, S.M.; Werner-Washburne, M.; Brinker, C.J.: *Science*, **313** (5785) 337-341. *113 citations.*

Highly Cited Patents

1. Bein, T; Brown, KD, Frye, GC; Brinker, C.J. Molecular Sieve Sensors for Selective Detection at the Nanogram Level. US Patent 5,151,110, Sep 19, 1992. *2007 citations.*
2. Frye, GC; Brinker, CJ; Doughty, DH; Bein, T; Moller, K. Coatings with Controlled Porosity and Chemical Properties. US Patent 5,589,396, Dec 31, 1996. *123 citations.*
3. Deshpande, R; Smith, D; Brinker, CJ. Preparation of High Porosity Xerogels by Chemical Surface Modification. WO Patent 1,994,025,149, Nov 10, 1994. *112 citations.*

4. Anderson, MT; Brinker, CJ; Ganguli, R; Lu, Y. Process to form Mesostructured Aerogels. US Patent 5,858,457. Jan 12, 1999. *111 citations.*

E. Honors and Awards; Professional Societies; and Review and Advisory Committees:

Awards and Honors

- 1988 W.H. Zachariasen Award for best contribution to the glass literature 1985-87, awarded by the Journal of Non-Crystalline Solids.
- 1986 Department of Energy Basic Energy Sciences Award for Outstanding Scientific Accomplishment in Metallurgy and Ceramics
- 1993 Directeur de Recherche Universite Pierre et Marie Curie, Paris VI
- 1994 Department of Energy Basic Energy Sciences Award for Significant Implications for DOE Related Technologies in Metallurgy and Ceramics.
- 1995 Department of Energy Basic Energy Sciences Award for Sustained Outstanding Research in Metallurgy and Ceramics.
- 1996 American Chemical Society Ralph K. Iler Award in the Chemistry of Colloidal Materials.
- 1996 R&D 100 Award: Low Temperature/Pressure Aerogel Process
- 1996 Lockheed Martin NOVA Award
- 1998 Motorola/CMEM Research Mentorship Award
- 1998 Department of Energy Basic Energy Sciences Award for Outstanding Scientific Accomplishment in Metallurgy and Ceramics
- 2001 Collegiate Inventors Competition Award for Optically-Adjustable Nanostructures
- 2002 Elected to the National Academy of Engineering
- 2002 DOE Ernest O. Lawrence Memorial Award in Materials Science
- 2003 Materials Research Society MRS Medal
- 2005 University of New Mexico Research Excellence Award
- 2006 Directeur de Recherche Universite Pierre et Marie Curie, Paris VI
- 2006 Rutgers University Distinguished Alumnus Award
- 2007 R&D 100 Award: Self-Assembling Process for Fabricating Tailored Thin Films
- 2008 R&D100 Award: Patterned Superhydrophobic Surfaces
- 2008 Edward R. Orton Jr. Memorial Award, American Ceramic Society and ASM
- 2009 IBM Distinguished Lecturer in Materials Science and Engineering
- 2009 Named Fellow of the Materials Research Society
- 2010 Robert B. Sosman Award, American Ceramic Society
- 2011 R&D100 Award Biomimetic Water Purification Membranes
- 2012 Médaille du Collège de France, Paris
- 2012 Federal Laboratory Consortium, Notable Technology Development Award – Biomimetic Membranes
- 2013 Federal Laboratory Consortium, Outstanding Regional Partnership – UNM Health Sciences Center/Sandia National Laboratories Partnership
- 2014 Federal Laboratory Consortium, Notable Technology Development Award, Nano-Stabilized Enzymatic Membrane for CO₂ Capture
- 2014 Elected to Board of Directors, Materials Research Society (3 year term)
- 2015 Conference Organizing Committee, Session Chair, Featured Speaker Fourth International Conference on Multifunctional Hybrid and Nanomaterials, Sitges/Barcelona, Spain, March 9-13, 2015
- 2015 University of New Mexico STC, Innovation Award for U.S. Patents 8,663,742, "Durable Polymer/Aerogel Based Superhydrophobic Coatings, A Composite Material"; 8,734,816, "Porous Nanoparticle Supported Lipid Bilayer Nanostructures"; and 8,864,045, "Aerosol Fabrication

Methods for Monodisperse Nanoparticles".

Professional Societies and Review and Advisory Committees

- **Peer Review:** Editorial Boards for *J. Nanomaterials*, *J. Sol-Gel Science/Technology*; *Small*; *Current Opinion in Solid State and Materials Science*, *ACS Nano*. Editor: *Annual Review of Nanoresearch*.
- **Advisory Role:** Advisory Boards for International Workshop on Glasses and Ceramics from Gels; International Conference on Inorganic Membranes; International Conference on Multifunctional Hybrid and Nanomaterials, International Symposium on Aerogels. Founder and Co-Organizer, Materials Research Symposium Series: *Better Ceramics Through Chemistry* I, II, III, IV, V, VI and *Organic/Inorganic Hybrid Materials* I, II, III. Member, Board of Directors, Materials Research Society.
- **Federal Advisory Roles:** U.S. Air Force Scientific Advisory Board, Consultant; President's Council of Advisors on Science and Technology (PCAST), consultant; NSF National Nanoscience Initiative Review Panel; Brookhaven National Laboratory, Program Reviewer; DOE/BES Materials Sciences and Engineering Division Program Reviewer, Naval Research Laboratory, BioMolecular Materials Program Reviewer, BES Office of Science Committee of Visitors.
- **Honorary Affiliations:** Fellow American Ceramics Society, Fellow Materials Research Society, Directeur de Recherché Université Pierre et Marie Curie, Paris VI, Member National Academy of Engineering.

F. Research Interests: Silica sol-gel chemistry, inorganic polymers, controlled porosity materials, fundamentals of film formation, defects in glasses and gels, novel inorganic materials, sensors, inorganic membranes, nanostructured/nanoconfined composites, aerogels, self-assembled structures, nanocrystals, bio-nano interfaces, superhydrophobicity, biomimicry and cell-based devices, drug delivery, vaccine development, sensors, atomic layer deposition, nanolithography

G. Professional Activities

- Brinker actively worked to involve chemists in ceramic science and engineering by creating the very successful Materials Research Society symposium series, Better Ceramics Through Chemistry, which ran biennially for fourteen years and recently spawned a successor series on Organic/Inorganic Hybrid Materials. Commenced in 1984, this was arguably the first symposium series to focus on 'bottom-up' assembly of nanostructured materials from molecular precursors and served as a primary basis for contemporary activities in nanotechnology
- Brinker co-authored a textbook entitled, Sol-Gel Science: The Physics and Chemistry of Sol-Gel Processing (Academic Press, 1990), with George Scherer (Princeton University). This book has served as a valuable resource to the worldwide scientific community who are now working in this burgeoning field and remains the most highly cited textbook on sol-gel processing (over 10,000 copies sold).
- Brinker co-authored two chapters in Nanotechnology Research Directions for Societal Needs in 2020: Retrospective and Outlook, M.C. Roco, C.A. Mirkin, M.C. Hersam, eds. (October 2010): "Nanotechnology for Sustainability: Energy Conversion, Storage, and Conservation", with David Ginger and "Nanotechnology for Sustainability: Environment, Water, Food, Minerals, and Climate" with M. Diallo.

H. Major Student/Post-doc Awards and Fellowships:

- **Terisse Brocato** (PhD student) School of Engineering Award – the Charlotte and William Kraft Graduate Fellowship, the University of New Mexico, 2013-2015

- **Paul Durfee** (MS 2013, PhD student) Best poster award “Size and Surface Engineered Mesoporous Nanoparticles Direct Altered Biodistribution and Clearance”, P. Durfee, Y.S. Lin, J. Townson, J. Minster, C.J. Brinker. Rio Grande Symposium on Advanced Materials, RGSAM, October 2013, Albuquerque, NM
- **Paul Durfee** (MS 2013, PhD student) George D. Montoya Research Scholarship, the University of New Mexico, 2013
- **Paul Durfee** (MS 2013, PhD student) School of Engineering Award – the Charlotte and William Kraft Graduate Fellowship, the University of New Mexico, 2013-2014
- **Paul Durfee** (MS 2013, PhD student) Edmund J. and Thelma W. Evans Charitable Trust Scholarship, the University of New Mexico, 2012-2013.
- **Yu-Shen Lin** (U. Minnesota; post-doc) Center for Nanotechnology in Cancer Fellowship, the University of New Mexico, 2013-2014.
- **Jason Townson** (U. W. Ontario; post-doc) Junior Investigator Award, Gabrielle’s Angels Foundation, 2012-2013.
- **Lauren Zarzar** (visiting graduate student, Harvard University) Akzo-Nobel Student Award, American Chemical Society, Denver, CO, August 28 – September 2, 2011. For work performed summers 2010-2011 while mentored by Bryan Kaehr, C. Jeffrey Brinker, published in *Angewandte Chemie*
- **David Padilla** (PhD student), Eric Carnes, Katie Epler, Robert Castillo, Genevieve Phillips, Jeff Brinker, Carlee Ashley, *The Selective Transfection of Hepatocellular Carcinoma Using Peptide Targeted Silica Nanoparticle-Supported Lipid Bilayers*, 23rd Rio Grande Symposium on Advanced Materials – RGSAM, Best Poster competition, 2nd place, Albuquerque, NM Oct 2011.
- **Mekensey Buley** (M.S. 2012) Graduate Research Fellowship (Nanoparticle Human Interactions), Sandia National Laboratories/University of New Mexico Excellence in Engineering Research Program, 2011-2012.
- **Carlee Ashley** (PhD May 2010), President Harry S. Truman Postdoctoral Fellowship, Sandia National Laboratories, 2010 – 2013.
- **Annikka Jensen** (PhD student), Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Integrating Nanotechnology with Cell Biology and Neuroscience, 2010-2012.
- **Carlee Ashley** (PhD May 2010), Outstanding Graduate student 2010, Chemical and Nuclear Engineering Department, the University of New Mexico.
- **Carlee Ashley** (PhD May 2010), Michael Gallegos Prize for Entrepreneurship, \$25,000, University of New Mexico Technology Business Plan Competition, April 2010
- **Carlee Ashley** (PhD May 2010), Materials Research Society Graduate Student Silver award, December 2009
- **Carlee Ashley** (PhD May 2010), Mekensey Buley (MS 2013), D.S. Peabody, and C.J. Brinker. Materials Research Society Fall Meeting, *Targeted in-vitro Delivery of a Chemotherapeutic Agent to Human Hepatocarcinoma via a Bacteriophage Carrier*, Top Poster Award, Open competition (599 entries), Dec 2008.
- **Carlee Ashley** (PhD May 2010), Darren Dunphy, **Eric Carnes** (PhD 2008), D. Petsev, P. Atanassov, D.S. Peabody, and C. J Brinker, Materials Research Society Fall Meeting, *Self-Assembly of Well-Ordered, Close-Packed 2D Arrays of Recombinant Virus-Like Particles that Nucleate the Growth of Inorganic Nanomaterials*, Top Ten Poster Award, Open competition (609 entries), December 2008.
- **Shisheng Xiong** (PhD Dec 2010), Y. Gao, J. Pang, John Grey, and C. J. Brinker. Materials Research Society Fall Meeting, *Functional Monolayer Nanoparticle/polymer Composites Formed*

by Evaporation Induced Self-Assembly at a Fluid Interface, Top Ten Poster Award, Open competition (600 entries), Dec 2008.

- **Jennifer Pelowitz** (MS 2012), Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Integrating Nanotechnology with Cell Biology and Neuroscience, 2009-2011.
- **Patrick Johnson** (PhD student), Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Integrating Nanotechnology with Cell Biology and Neuroscience, 2008-2011.
- **Adam Wise** (PhD 2012) Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Nanoscience and Microsystems, National Science Foundation, 2007-2010.
- **Eric Carnes** (PhD July 2008), **Carlee Ashley** (PhD May 2010), NSF Ethics Fellows, the University of New Mexico, National Science Foundation Pilot Program between School of Engineering and Department of Philosophy graduate students to develop and team-teach *Engineering Ethics*, 2007-2008.
- **Carlee Ashley** (PhD May 2010), Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Nanoscience and Microsystems, National Science Foundation, 2006-2009.
- **Ryan Molecke** (PhD 2011), Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Nanoscience and Microsystems, National Science Foundation, 2006-2009.
- **Eric C. Carnes** (PhD 2008), 3rd Annual Symposium on Integrating Nanotechnology with Cell Biology and Neuroscience – INCBN IGERT, August 17-18, 2009, Albuquerque, NM, NSF IGERT Graduate Fellow Award.
- **Eric Carnes** (PhD July 2008) Integrated Graduate Education and Research Traineeship (IGERT) Fellowship in Integrating Nanotechnology with Cell Biology and Neuroscience, National Science Foundation, 2006-2008.
- **Cynthia M. Douthit** (undergrad Chem Eng), **Eric C. Carnes** (PhD 2008), **Carlee Ashley** (PhD 2010), **DeAnna Lopez** (undergrad Chem Eng), **Alex Capecehatro** (visiting student, UCLA), and C. Jeffrey Brinker. CCMC Fall 2008 Industrial Advisory Board (IAB) and Technical Review Meeting, University of New Mexico, Albuquerque, NM, November 18–20, 2008. *Examining Integration Techniques using Living Yeast Cells into Self-Assembled Nanostructures*, 1st place, student poster competition.
- **DeAnna Lopez** (undergrad Chem Eng), **Eric Carnes** (PhD 2008). Microscopy Facility Image Competition, Cancer Center Fluorescence Microscopy Facility, University of New Mexico, February 2008, Albuquerque, NM. First prize, Spectral Image category, Confocal microscope image “Cells Take the Lead” in Life in Print, Science News Online, Jan 26, 2008, vol. 173, no. 4, p. 56.
- **Carlee Ashley*** (PhD 2010), **Eric Carnes** (PhD 2008), Landon White (undergrad Chem Eng), Zhen Yuan, Darren Dunphy, Dimiter Petsev, Plamen Atanassov, David Peabody, Jin Wang, and C. Jeffrey Brinker. New Mexico Chapter of the American Vacuum Society, Albuquerque, NM, May 22, 2007. *Grazing Incidence Small Angle X-ray Scattering (GISAXS) Characterization of 2D Bacteriophage Arrays Deposited via Convective Assembly*, First prize*, Graduate Student Oral Paper Competition (* all expenses paid trip to the AVS 54th International Symposium, Seattle, WA, October 14-19, 2007).
- **Carlee Ashley** (PhD 2010), **Eric Carnes** (PhD 2008), Helen Baca, Deanna Lopez (undergrad Chem Eng), Seema Singh, Jeff Brinker. Industrial Advisory Board Meeting of the UNM/Rutgers/Penn State Ceramic and Composite Materials Center (CCMC), March 13, 2007, Albuquerque, NM. *Cell-Directed Assembly of 3-D Bio-Nano Interfaces*, First Prize, Graduate student poster competition.

- **The Top 20 Most-Cited Papers in Materials Science**, 1996-2006. In-cites Essential Science Indicators, <http://www.in-cites.com/papers/top20-mat-sci.html>, November 2006, *Continuous formation of supported cubic and hexagonal mesoporous films by sol-gel dip-coating*. Lu Y.F. (PhD 1998), Ganguli, R. (MS 1997), Drewien, C.A., Anderson, M.T., Brinker, C.J., Gong, W.L., Guo, Y.X. Soyez, H., Dunn, B., Huang, M.H., Zink, J.I., NATURE, v. 389, pp. 364-368 (1997).
- **Helen K. Baca** (PhD 2005), Materials Research Society Student Gold Award, 2005
- **Helen Baca** (PhD 2005), DoD National Science and Defense Graduate Fellowship, 2001- 2003
- **Dhaval Doshi** (PhD 2002) Los Alamos National Laboratory Director's Postdoctoral Fellowship, 2002-2004
- **Dhaval Doshi** (PhD 2002), Collegiate Inventors Competition Award, *Optically-Adjustable Nanostructures*, 2001
- **Dhaval Doshi** (PhD 2002), Materials Research Society Student Gold Award, 2001 **Yunfeng Lu** (PhD 1998), Presidential Early Career Award for Scientists and Engineers (PECASE), 2005.
- **Mencheng Lu** (PhD 2001), Materials Research Society Best Poster Award, 1999
- **Hongyou Fan** (PhD 2000), Materials Research Society Student Silver Award, 2000
- **Hongyou Fan** (PhD 2000), University of New Mexico Chemical Engineering Alumni Award for Outstanding Graduate student, 2000
- **Yunfeng Lu** (PhD 1998), Materials Research Society Student Gold Award, 1999
- **Yunfeng Lu** (PhD 1998), American Chemical Society Unilever (Young Investigator) Award in Colloid and Surface Chemistry, 2005
- **Yunfeng Lu** (PhD 1998), 31st American Chemical Society Victor K. LaMer PhD Thesis Award in Colloid and Surface Chemistry, 2000

D. Student Awards

- Bouvie, C.; Epler, K.; Padilla, D.; Gomez, A.; Anderson, M.; Fleig, P.; Chackerian, B.; Brinker, C. J.; Ashley, C. E.; Carnes, E. C. Mesoporous Oxide Nanoparticles for Controlled Release and Targeted Delivery of Antigens., MRS Spring 2014 Meeting. Symposium Y: Biomaterials for Biomolecule Delivery and Understanding Cell-Niche Interactions., San Francisco, CA., April 2014. Best Presentation Award, MRS Symposium Y.
- David Padilla, Brian Wilkinson, Trevin Heisey, Cameron Burgard, Cody Wiley, Linda Felton, Jeffrey Brinker, and Eric Carnes, *Development of nanoporous particle-supported lipid bilayers (Protocells) for topical and transdermal delivery of various therapeutics*, Rio Grande Symposium on Advanced Materials – RGSAM, Best Poster competition, 1st place (Tie), Albuquerque, NM Oct 22, 2012

- David Padilla, Eric Carnes, Katie Epler, Robert Castillo, Genevieve Phillips, Jeff Brinker, Carlee Ashley, *The Selective Transfection of Hepatocellular Carcinoma Using Peptide Targeted Silica Nanoparticle-Supported Lipid Bilayers*, Rio Grande Symposium on Advanced Materials – RGSAM, Best Poster competition, 2nd place, October 11, 2011, Albuquerque, NM
- D. Padilla, KE Epler, RE Castillo, G. Phillips, D. Wilkinson, C. Burgard, B. Wilkinson, N. Johannes, EC Carnes, CJ Brinker and CE Ashley, First prize, poster competition, *Development of Porous Nanoparticle-Supported Lipid Bilayers (Protocells) for Targeted-Gene Delivery*, American Vacuum Society, May 24, 2011, Albuquerque, NM,
- Katie Epler, 2011-2012 New Mexico Society of Professional Engineers – Albuquerque Chapter Scholarship by the New Mexico Engineering Foundation
- RE Castillo, KE Epler, D. Wilkinson, N. Johannes, A. Jensen, C.E. Ashley, E.C. Carnes and CJ Brinker, *Development of Porous Nanoparticle-Supported Lipid Bilayers (Protocells) for Targeted-Gene Delivery*, Rio Grande Symposium on Advanced Materials – RGSAM, Best Undergraduate Student Poster competition, 1st place, October 11, 2010, Albuquerque, NM
- Cynthia M. Douthit, Eric C. Carnes (PhD 2008), Carlee Ashley (PhD 2010), DeAnna Lopez, Alex Capecelatro, and C. Jeffrey Brinker. American Institute of Chemical Engineers - AIChE 2008 Annual Meeting, Philadelphia, November 16-21, 2008. *Examining Integration Techniques using Living Yeast Cells into Self-Assembled Nanostructures*, 2nd place, student poster competition.
- Alison Stace-Naughton, Dartmouth visiting undergrad (summer 2008, winter 2009; co-author JACS 2009 paper), Goldwater Fellowship, 2009-2011
- Eric Carnes (PhD 2008), Carlee Ashley (PhD 2010), DeAnna Lopez (Undergrad Chem Eng), Cynthia Douthit (Undergrad Chem Eng); Seema Singh; Darren Dunphy; C. Jeffrey Brinker. New Mexico Chapter of the American Vacuum Society, Albuquerque, NM, May 22, 2007. *Integration of Living Cells within Self-Assembled Nanostructures*, First Prize, Undergraduate Student Poster Competition.
- Cynthia M. Douthit (undergrad Chem Eng), Eric C. Carnes (PhD 2008), Carlee Ashley (PhD 2010), DeAnna Lopez (undergrad Chem Eng), Shelly Karlin (undergrad Chem Eng), Jennifer Pelowitz (undergrad Chem Eng), Alex Capecelatro (undergrad UCLA), Darren Dunphy, Hattie Gresham, Graham Timmins, University of New Mexico, Albuquerque, New Mexico; and C. Jeffrey Brinker, Sandia National Laboratories, Albuquerque, New Mexico. Rio Grande Symposium on Advanced Materials -- RGSAM, October 9, 2007, Albuquerque, NM, *Integrating Living Yeast Cells into Patterned Self-Assembled Nanostructures*, First Prize, Undergraduate student poster competition
- David J. Kissel (PhD 2011), Daniel D. Gonzales (undergrad), The University of New Mexico, Albuquerque, NM; C. Jeffrey Brinker, Sandia National Laboratories, Albuquerque, NM. Rio Grande Symposium on Advanced Materials -- RGSAM, October 9, 2007, Albuquerque, NM. *High Precision Water Adsorption Behavior on a Variety of Surfaces and Materials Using Advanced Ultrasonic Techniques*, Second Prize, Undergraduate student poster competition.
- Andrew D. Collord (Undergrad Chem Engr) and Darren R. Dunphy, University of New Mexico, Albuquerque, NM; Michael Tate and Hugh Hillhouse, Purdue University, West Lafayette, IN; C.

Jeffery Brinker, University of New Mexico, Albuquerque, NM and Sandia National Laboratories, Albuquerque, NM. Rio Grande Symposium on Advanced Materials -- RGSAM, October 9, 2007, Albuquerque, NM. *Structure and Aqueous Stability of Surfactant-Templated Porous Films Synthesized using a Hybrid Inorganic/Organic Sol-Gel Precursor*, Third Prize, Undergraduate student poster competition.

- Patrick Johnson (undergrad UCSD), Eric Branson (undergrad UNM), C. Jeffrey Brinker, and Seema Singh, Sandia National Laboratories' Student Symposium, Albuquerque, NM, August 2, 2007. *Gecko Inspired Super Adhesives*, First Prize, Undergraduate Student Poster Competition.
- DeAnna Lopez (Undergrad Chem Eng), Eric Carnes (PhD 2008), Carlee Ashley (PhD 2008), Cynthia Douthit (undergrad Chem Eng), Jennifer Pelowitz (undergrad Chem Eng), Shelly Karlin (undergrad Chem Eng), Anny Alsup, Hattie Gresham, Graham Timmins, Jeffrey Brinker. Sandia National Laboratories' Student Symposium, Albuquerque, NM, August 2, 2007. *Cell-to-cell communication among nano-confined cells in self-assembled matrices*, First Prize, Undergraduate Student Poster Competition.
- Patrick Johnson (undergrad UCSD), Eric Branson (undergrad UNM), C. Jeffrey Brinker, and Seema Singh, Rio Grande Symposium on Advanced Materials – RGSAM, Albuquerque, NM, October 10, 2006. *Gecko Inspired Super Adhesives*, Third Prize, Undergraduate Student Poster Competition.

E. Invited Presentations (2001-2014)

1. Townson JL, Lin Y-S, Durfee P, Ashley CE and Brinker C. Jeffrey, *Protocells: Mesoporous silica nanoparticle supported lipid bilayers for targeted delivery*, Fourth International Conference on Multifunctional Hybrid and Nanomaterials, Sitges/Barcelona, Spain, March 9-13, 2015 (Conference Organizing Committee, Session Chair, Featured Speaker)
2. Brinker, C. Jeffrey. *Peptide-Directed Protocells and Virus-Like Particles*. 2014 Principle Investigators Meeting, NCI Alliance for Nanotechnology in Cancer, Rockville, MD, October 1-3, 2014.
3. Brinker, C. Jeffrey. *Protocells for Synthetic Biology*. DOE Workshop on Dissipative Self-Assembly as a Foundation for Biomimetic Systems, Pittsburgh, PA, August 14-15, 2014.
4. Brinker, C. Jeffrey. *Protocells: Mesoporous silica nanoparticles encapsulated within synthetic or active cell membranes for drug delivery*, 5th Annual Nanotechnology for Health Care Conference, Winthrop Rockefeller Institute/University of Arkansas, Morrilton, AK, April 2-4, 2014.
5. Brinker, C. Jeffrey. *Advancing the Frontiers of Science and Engineering*, Sandia Fellows Symposium in Recognition of National Engineers' Week, Sandia National Laboratories, *Self-Assembly of Functional Nanostructures*, Albuquerque, NM, February 19, 2014.
6. Brinker, C. Jeffrey. University of Virginia School of Engineering, Mechanical and Aerospace Engineering, Fall 2013 Seminar Series. *Silica @ Cells: A Special Interface*,

- Charlottesville, VA, October 17, 2013.
7. Townson JL, Lin Y-S, Agola JO, Carnes EC, Leong HS, Lewis JD, Walker W, Willman CL, and Brinker, C. Jeffrey. *Re-Examining the Size/Charge Paradigm: Differing In Vivo Characteristics of Size and Charge-Matched Mesoporous Silica Nanoparticles*, NCI Alliance for Nanotechnology in Cancer, Bethesda, MD, Bethesda, MD, September 17-19, 2013.
 8. Brinker, C Jeffrey. Colorado School of Mines, Metallurgical/Materials Engineering, *Re-Examining the Size/Charge Paradigm: Differing In Vivo Characteristics of Size and Charge-Matched Mesoporous Silica Nanoparticles*, Golden, CO, Sep 11 2013
 9. Brinker, C Jeffrey. *Sol-Gel Strategies for Optimized Hierarchical Materials*, Exxon Mobile, Houston, TX, June 28, 2013.
 10. Brinker CJ, Ashley CE, Carnes CE, Kaehr BJ, Townson J. *Nano-Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology and Disease*. Bottom-Up Approaches to Nanotechnology, Le Studium® Conference, Loire Valley Institute for Advanced Studies, Orléan, FR, May 29-31, 2013.
 11. Brinker CJ, Carnes EC, Ashley CE, and Townson JL. *Protocells: Mesoporous Silica Supported Lipid Bilayers for Targeted Delivery of Multicomponent Cargos*. 254th American Chemical Society National Meeting – Division of Polymer Chemistry, Hybrid Materials Symposium. New Orleans, LA, April 7-11, 2013.
 12. Brinker CJ, Townson JL, Kaehr BJ, Carnes EC, and Ashley CE. *Silica and Cells, A Special Relationship*. 254th American Chemical Society National Meeting – ACS Award in Colloid and Surface Chemistry: Symposium in Honor of Steve Granick. New Orleans, LA, April 7-11, 2013.
 13. Townson J, Lin Yu-Shen, Ashley CE, Carnes EC, and Brinker CJ. *Protocells: Mesoporous Silica Nanoparticle. Supported Lipid Bilayers for Targeted Delivery of Multicomponent Cargos to Cancer*. Materials Research Society Spring 2013 meeting, Symposium MM: New Tools for Cancer Using Nanomaterials, Nanostructures, and Nanodevices. San Francisco, CA, April 1-5, 2013.
 14. Brinker CJ, Ashley CE, Carnes EC, Kaehr BJ, Duphy DR, Townson JL. *Silica cells: A Special Hybrid Interface*. 3rd International Conference on Multifunctional, Hybrid and Nanomaterials, Sorrento, Italy, March 3-7, 2013.
 15. Ashley, Carlee; Carnes, Eric; Epler, Katharine; Padilla, David; Townson, Jason; Wharton, Walker; and Brinker, C. Jeffrey. *Protocells: Mesoporous silica supported lipid bilayers for targeted delivery of multicomponent cargos to cancer*. Nanoscience and Nanotechnology for Health and Medicine, 224th ACS National Meeting, August 19-23, 2012, Philadelphia, PA.
 16. Brinker, C. Jeffrey; Ashley, Carlee; Carnes, Eric; Kaehr, Bryan and Townson, Jason. *Silica and Cells: A special relationship*, XXI International Materials Research Congress, August 12-17, 2012, Cancun, Mexico.
 17. Brinker, C. Jeffrey. *Silica and Cells: A special relationship*, Nippon Sheet Glass Lecture,

University of California, July 19, 2012, Los Angeles, CA.

18. Brinker, C. Jeffrey. *Evaporation Induced Self-Assembly of Porous and Composite Nanostructures*, Chemistry of Hybrid Materials Guest Lecture, Collège de France, June 5, 2012, Paris, France.
19. Brinker, C. Jeffrey. *Protocells (Nanoporous Particle Supported Lipid Bilayers) for Targeted Drug Delivery*, Chemistry of Hybrid Materials Guest Lecture, Collège de France, June 12, 2012, Paris, France
20. Brinker, C. Jeffrey. *Replicating Cellular Life Forms in Silica*, Chemistry of Hybrid Materials Guest Lecture, Collège de France, June 19, 2012, Paris, France
21. Brinker, C. Jeffrey. *Biotic/Abiotic Materials: Behavior of Cells in Nanostructural Isolation*, Chemistry of Hybrid Materials Guest Lecture, Collège de France, June 26, 2012, Paris, France
22. Brinker, C. Jeffrey. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology*, Materials Science and Engineering Seminar Series, Carnegie Mellon University, April 27, 2012, Pittsburgh, PA
23. Brinker, C. Jeffrey, Dunphy, Darren R., Jiang, Ying-Bing, and Chen, Zhu. *Evaporation-induced Self-assembly of Porous and Composite Thin Film Nanostructures*, Materials Research Society Spring 2012 Meeting, Solution Synthesis of Inorganic Films and Nanostructured Materials Symposium, April 9-13, 2012 San Francisco, CA .
24. Brinker, C. Jeffrey, Ashley, Carlee E., Carnes, Eric C., Castillo, Robert E., Epler, Katharine E., Padilla, David P., Townson, Jason L., and Wharton, Walker. *Protocells: Nanoporous Nanoparticle Supported Lipid Bilayers for Targeted Delivery of Multicomponent Cargos to Cancer*, Materials Research Society Spring 2012 Meeting, Hierarchically Self-assembled Materials—From Molecule to Nano and Beyond Symposium, April 9-13, 2012 San Francisco, CA.
25. Kaehr, Bryan J., Townson, Jason L, and Brinker, C Jeffrey. *Cell replication in silico*, American Chemical Society 2012 Annual Meeting, Self-Assembled Nanostructures of Biopolymers, Organic Semiconductors, and Inorganics Symposium, March 25-30, 2012, San Diego, CA.
26. Brinker, C. Jeffrey. *Protocells: Mesoporous Silica Supported Lipid Bilayers for Targeted Delivery of Multicomponent Cargos to Cancer*, Frontiers in Nanotechnology Seminar Series, Life and Biomedical Sciences, Northwestern University, March 16, 2012, Evanston, IL
27. Brinker, C. Jeffrey. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology and Disease*, Department of NanoEngineering, Jacobs School of Engineering, University of California, March 7, 2012, San Diego, CA.
28. Brinker, C. Jeffrey. *Protocells: Mesoporous Silica Supported Lipid Bilayers for Targeted Delivery of Multicomponent Cargos to Cancer*, 2012 Nanobiotechnology Seminar Series, Stanford School of Medicine, March 6, 2012, Palo Alto, CA.
29. Brinker, C. Jeffrey. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology and Disease*, Department of Chemical and Environmental Engineering Seminar series, University of California, January 27, 2012, Riverside, CA

30. Jiang, Ying-Bing, Yang S, Rogers, D, Leung, K, and Rempe S. *Merging Self-Assembly with Atomic Layer Deposition to Mimic Biological Water Purification Membranes*. Materials Research Society Fall Meeting, Water Purification and Separation Symposium, November 28 – December 2, 2011, Boston, MA.
31. Brinker, C Jeffrey. *Cell and Protein Directed Sol-Gel Processing of Biotic-Abiotic Interfaces and Architectures*, 16th Annual International Sol-Gel Conference, August 28 - September 2, 2011, Hangzhou, China.
32. Brinker, C. Jeffrey. *Less is More: Achieving Complex Functionality in Simple Porous Nanoparticles*, 1st Gordon Conference on Cancer Nanotechnology, Colby College, Waterville, ME, July 17-22, 2011
33. Brinker, C. Jeffrey. *Evaporation-Induced Self-Assembly of Nanoporous Materials*, Gordon Conference on Nanoporous Materials and Their Applications, Holderness School, August 7-12, 2011, Holderness, NH
34. Brinker, C. Jeffrey, *Uses of Mesoporous Hybrids for Nanomedicine*, invited tutorial, Hybrid Materials 2011, Second International Conference on Multifunctional, Hybrid and Nanomaterials, March 6-10, 2011, Strasbourg, FR
35. Brinker, C. Jeffrey, Ashley, C.E., Carnes, E.C., Khripin, C., Kaehr, B.J. *Directing Sol-Gel Processing with Proteins and Living Cells*. Robert B. Sosman Award Lecture, American Ceramics Society, Materials Science and Technology 2010 Conference, October 17-21, 2010, Houston, TX.
36. Brinker, C. Jeffrey. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology*, Karolinska Institutet, Swedish Medical Nanoscience Center, Sept 7, 2010, Stockholm, Sweden
37. Brinker, C. Jeffrey. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology*, Plenary lecture, XIX International Materials Research Congress 2010, August 15-19, 2010, Cancun, Mexico
38. Brinker, C. Jeffrey. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology*, Center for Nanoscience – CeNS, University of Munich, July 21, 2010, Munich Germany
39. Brinker, C. Jeffrey, Ashley, C.E., Carnes, E.C., Kaehr, B.J. *Engineered Biotic/Abiotic Materials and Interfaces for Understanding and Controlling Biology*, California NanoSystems Institute - CNSI, University of California, April 23, 2010, Los Angeles, CA.
40. Brinker, C. Jeffrey. *Merging Evaporation-induced Self-assembly With Plasma-directed Atomic Layer Deposition to Fabricate Natural Designs in Silica*, Materials Research Society Spring meeting, Novel Assembly Methods, Structures and Properties Symposium, April 5-9, 2010, San Francisco, CA.
41. Brinker, C. Jeffrey. *Protocells-A Universal Nanocarrier for Targeted Delivery of Multicomponent Cargos to Cancer*. NIH 4th Annual NDC Awardee Meeting, April 5-8, 2010, Pacific Grove, CA.

42. Brinker, C. Jeffrey. *Biotic/Abiotic Interfaces, Materials, and Architectures*. Vanderbilt University Department of Chemical & Biomolecular Engineering, February, 22, 2010, Nashville, TN.
43. Brinker, C. Jeffrey. *Protocells – A Universal Nanocarrier for Targeted Delivery of Multicomponent Cargos to Cancer*, Medtronic, February 9, 2010, Minneapolis, MN.
44. Brinker, C. Jeffrey. *Keynote talk: Protocells – A Universal Nanocarrier for Targeted Delivery of Multicomponent Cargos to Cancer*, Nanomedicine and Molecular Imaging Summit – SNM Molecular Imaging Center of Excellence, January 31-February 2, 2010, Albuquerque, NM.
45. Brinker, C. Jeffrey. *Metabolically and Optically Defined Lithography Using Living Cells – A New Platform for Cellular Integration*. Chemical and Biological Defense Science and Technology (CBD S&T) Conference, November 16-20, 2009, Dallas, Texas.
46. Brinker, C. Jeffrey. *Sol-Gel Strategies for Optimized Hierarchical Materials*, 2009 AIChE Annual Meeting, Plenary Session for Stine Award, November 9-13, 2009, Nashville, TN.
47. Brinker, C. Jeffrey (E.C. Carnes, co-author). *Metabolically and Optically Defined Lithography Using Living Cells*, 13th International Conference on Surface and Colloid Science - 83rd ACS Colloid and Surface Science Symposium, June 14-19, 2009, Columbia University, New York, NY.
48. Brinker, C. Jeffrey. *Sol-Gel Strategies for Optimized Hierarchical Materials*. Materials Research Society Spring Meeting, Architected Multifunctional Materials Symposium, April 12-17, 2009, San Francisco, CA.
49. Brinker, C. Jeffrey. *Metabolically and Optically Defined Lithography using Living Cells*. 237th ACS National Meeting. Chemical Methods of Nanofabrication Symposium, March 23, 2009. Salt Lake City, UT.
50. Brinker, C. Jeffrey. *Evaporation-Induced Self-Assembly of Porous and Composite Nanostructures and New Bio-Nano Interfaces*. Rensselaer Polytechnic Institute, IBM Distinguished Lecture, February 4, 2009. Troy, NY.
51. Brinker, C. Jeffrey. *Biomimetic and Bioinspired Strategies for Drug Delivery with Nanoparticles*. 2009 Bioscience and Technology Forum, Sandia National Laboratories. January 26, 2009. Albuquerque, NM.
52. Brinker, C. Jeffrey. *Evaporation-Induced Self-Assembly of Porous and Composite Nanostructures*, Materials Research Society Fall 2008 Meeting, Low-Cost Solution-Based Deposition of Inorganic Films for Electronic/Photonic Devices Symposium, December 1-5, 2008. Boston, MA.
53. Brinker, C. Jeffrey. *Evaporation-Induced Self-Assembly at Solid and Fluid Interfaces and Its Extension to Cell-Directed Assembly*. Materials Research Society Fall 2008 Meeting, Grazing-Incidence Small-Angle X-Ray Scattering Symposium, December 1-5, 2008. Boston, MA.
54. Brinker, C. Jeffrey. *Directing the Assembly of “Sol-Gel” Silica Films with Living Cells*, Symposium International en l’honneur de Jacques Livage, College de France, November 18,

2008, Paris, France.

55. Brinker, C. Jeffrey. *Evaporation-Induced Self-Assembly of Porous and Composite Thin film Nanostructures*, Departments of Chemical Engineering and Materials Science and Engineering, Lehigh University, October 24, 2008, Bethlehem, PA.
56. Brinker, C. Jeffrey. *Sol-Gel Processing – A Retrospective and Perspective*, Edward Orton Jr. Memorial Lecture, American Ceramics Society 110th Annual Meeting, October 5-9, 2008. Pittsburgh, PA.
57. Brinker, C. Jeffrey. *Evaporation-Induced Self-Assembly of Porous and Composite Thin Film Nanostructures*, Skip Scriven Memorial Lecture, International Society of Coating Science and Technology, September 7-10, 2008, Marina del Rey, CA.
58. Brinker, C. Jeffrey. *Evaporation Induced Self-Assembly of Porous and Composite Nanostructures and New Bio-Nano Interfaces* Jacob J. Bikerman Lecture, Case Western Reserve University Department of Chemical Engineering, April 14, 2008, Cleveland, OH.
59. Brinker, C. Jeffrey. Gordon Conference on Composites. *Self-Assembly of Nanostructures*, January 17, 2008. Ventura, CA.
60. Brinker, C. Jeffrey. Argonne National Laboratory/Advanced Photon Source Basic Energy Sciences Operational Review, *Directing the Assembly of Nanostructured Films with Living Cells*, December 12, 2007. Argonne, IL.
61. Brinker, C. Jeffrey. HK IAS – US ICMR Workshop on Advanced Materials, *Directing the Assembly of Nanostructured Films with Living Cells*, HKUST, September 12-15, 2007. Hong Kong.
62. Brinker, C. Jeffrey. XIVth International Sol-Gel Conference. Invited Tutorial: *Sol-Gel Structure Formation: Disordered and Ordered*, September 2-7, 2007. Montpellier, FR.
63. Brinker, C. Jeffrey. XIVth International Sol-Gel Conference . *Directing the Self-Assembly of Nanostructured Sol-Gel Films with Living Cells*, September 2-7, 2007. Montpellier, FR.
64. Brinker, C. Jeffrey. Institute of Materials Research and Engineering (IMRE), *Evaporation Induced Self-Assembly of Functional Nanostructures*, August 16, 2007. Singapore
65. Brinker, C. Jeffrey. SBE 3rd International Conference on Bioengineering and Nanotechnology, *Symbiotic Assembly of Bio/Nano Interfaces and Architectures*, August 12-15, 2007. Biopolis, Singapore.
66. Brinker, C. Jeffrey. Department of Chemical and Environmental Engineering, University of California – Riverside, *Evaporation Induced Self-Assembly and its Extension to Living Cell-Directed Assembly of Novel Bio/Nano Interfaces*, June 1, 2007. Riverside, CA.
67. Brinker, C. Jeffrey. Argonne National Laboratory, *Directing the Assembly of Nanostructured Films with Living Cells*, May 29, 2007. Argonne, IL.
68. Brinker, C. Jeffrey. Materials Research Society Spring Meeting, Symposium S: Synthesis, Processing and Properties of Organic/Inorganic Hybrid Materials. *Evaporation-induced self-*

- assembly of porous and composite nanostructures*, April 10, 2007. San Francisco, CA.
69. Brinker, C. Jeffrey. Cabot Corporation, *Evaporation-Induced Self Assembly (EISA) of Porous and Composite Nanostructures*, . March 30, 2007. Billerica, MA
 70. Brinker, C. Jeffrey. Spring 2007 Meeting of the American Physical Society, *Directing the Assembly of Nanostructured Films with Living Cells*, March 5-9, 2007. Denver, CO.
 71. Brinker, C. Jeffrey. . University of Washington, Department of Chemistry, *Evaporation-Induced Self-Assembly (EISA) of Porous and Composite Nanostructures*, February, 16, 2007, Seattle, WA.
 72. Brinker, C. Jeffrey. Macromolecular Science and Engineering Symposium, University of Michigan, *Evaporation-Induced Self-Assembly of Porous and Composite Nanostructures*, October 26, 2006. Ann Arbor, MI.
 73. Brinker, C. Jeffrey. 2006 International Institute for Nanotechnology Symposium, Northwestern University, *Evaporation Induced Self-Assembly of Functional Nanostructures*, October 11-12, 2006. Evanston, IL.
 74. Brinker, C. Jeffrey. Argonne National Laboratory, Dedication of Argonne's Center for Nanoscale Materials, *Evaporation-Induced Self-Assembly of Porous and Composite Thin Film Nanostructures*, September 19, 2006. Argonne, IL.
 75. Brinker, C. Jeffrey. Northwestern University, Materials Science Department, *Symbiotic Assembly of Bio/Nano Interfaces and Architectures*, Evanston, IL.
 76. Brinker, C. Jeffrey. . 232nd American Chemical Society National Meeting & Exposition, *Bridging the Gap: Observation of Ultra Long Range Hydrophobic Interactions*, September 18, 2006. September 10-14, 2006, San Francisco, CA.
 77. Brinker, C. Jeffrey, St. Gobain Céramiques Avancées Desmarquest, *Surfactant-Directed and Living Cell-Directed Assembly of Porous and Composite 3-D Nanostructures*, June 2006, Montreuil, Cedex, France..
 78. Brinker, C. Jeffrey, Université Pierre et Marie Curie, *Surfactant-Directed and Living Cell-Directed Assembly of Porous and Composite 3-D Nanostructure*, Paris, June 2006, Cedex, France
 79. Brinker, C. Jeffrey, Materials Research Society Spring Meeting. *Bio-Inspired Self-Assembly of Synthetic Water Channels*, April 17-21, 2006, San Francisco, CA.
 80. Brinker, C. Jeffrey, Distinguished Alumnus Award Address, *Evaporation Induced Self-Assembly of Porous and Composite Nanostructures*, Rutgers University, March 3, 2006, New Brunswick, NJ
 81. Brinker, C. Jeffrey, Materials Research Society Multifunctional Ceramic Composites Workshop. *Bio-Inspired Self-Assembly of Porous and Composite 3D Nanostructures*, Beckman Institute, University of Illinois at Urbana-Champaign, October 3-5, 2005, Urbana, IL.
 82. Brinker, C. Jeffrey. 13th International Workshop on Sol-Gel Science and Technology. *Complex Structures and Functions through Cell-Directed Assembly*, August 21-26, 2005, Los Angeles,

CA.

83. Brinker, C. Jeffrey. NACE – Corrosion 2005. *Self-Assembly of Responsive Nanostructured Particles and Films for Smart Coatings*, April 3-7, 2005. Houston, TX.
84. Brinker, C. Jeffrey. Materials Research Society Spring Meeting, Self-Organizing Systems in Multifunctional Nanomaterials and Nanostructures Symposium, *Cell-Directed Assembly of the Bio-Nano Interface*, March 28 – April 1, 2005, San Francisco, CA.
85. Brinker, C. Jeffrey. 229th American Chemical Society Meeting, *Evaporation-Induced Self-Assembly of Porous, Composite and Biocompatible Thin Film Nanostructures*, March 13-17, 2005. San Diego, CA.
86. Brinker, C. Jeffrey. AAAS Annual Meeting, *Bio-Inspired Self-Assembly of Porous and Composite Nanostructures*, February 17-21, 2005. Washington, DC.
87. Brinker, C. Jeffrey. AFOSR Biomimetics, Biomaterials and Biointerfacials Sciences Program Review, *Bio-Inspired Self-Assembly of Porous and Composite Nanostructures*, January 16-21, 2005. San Diego, CA.
88. Brinker, C. Jeffrey. North Carolina State University, Department of Chemical Engineering. , *Evaporation-Induced Self-Assembly of Porous and Composite Thin film Nanostructures*,. September 20-21, 2004. Raleigh, NC.
89. Brinker, C. Jeffrey. ICI Small-Scale Structures Workshop, *Evaporation-Induced Self-Assembly of Porous and Composite Thin film Nanostructures*, September 17, 2004, Somerset, NJ.
90. Brinker, C. Jeffrey. Workshop on Membrane Science, Argonne National Laboratories Advanced Photon Source, *Evaporation-Induced Self-Assembly of Porous and Composite Thin film Nanostructures*, August 17-18, 2004. Argonne, IL.
91. Brinker, C. Jeffrey. 2nd IUPAC International Symposium on Macro- and Supra-Molecular Architecture and Materials (MAM-04), *Evaporation-Induced Self-Assembly of Porous and Composite Thin film Nanostructures*, June 13-17, 2004. Missoula, MT.
92. Brinker, C. Jeffrey. Symposium and Workshop on Mesoporous Crystals and Related Nanostructured Materials, *Evaporation-Induced Self-Assembly of Porous and Composite Nanostructures*, June 1-5, 2004, Stockholm, Sweden.
93. Brinker, C. Jeffrey. Stanford University, Department of Materials Science and Engineering, *Evaporation-Induced Self-Assembly of Porous and Composite Thin film Nanostructures*, April 29, 2004, Palo Alto, CA.
94. Brinker, C. Jeffrey. Particles 2004 Symposium, (KEY NOTE) *Evaporation Induced Self-Assembly of Nanocomposite Particles, Films, and Arrays*, March 6-9, 2004, Orlando, FL.
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40	8,734,816,	Porous Nanoparticle Supported Lipid Bilayer Nanostructures	May 27, 2014
39	8,501,057 B1	Freezing Assisted Fabrication of Nano and Micro Hollow Tube Cubic Metal Oxides	Aug 6, 2013
38	8,318,127 B1	Methods for Preparing High Crystallinity and surface Area Porous Metal Oxides	Nov 27, 2012

37	8,246,933	Aerosol Method for Nano Silver-Silica Composite Antimicrobial Agent	Aug 21, 2012
36	8,187,678	Ultra-Thin Microporous/Hybrid Materials	May 29, 2012
35	EP 2294152B1	Superhydrophobic Aerogel That Does Not Require Per-Fluoro Compounds or Contain any Fluorine	Nov 14, 2012
34	8,092,595	Self Assembly of Water Soluble Nanocrystals	Jan 10, 2012
33	7,947,579	Method of Making Dense, Conformal, Ultra-Thin Cap Layers of Nanoporous Low-k ILD by Plasma-Assisted Atomic Layer Deposition	May 24, 2011
32	RE 41,612E	Method for making surface-templated thin films	Reissued Aug 31, 2010
31	7,744,673B2	Hollow Sphere Metal Oxides	6/29/2010
30	7,485,343	Preparation of hydrophobic coatings	Feb 9, 2009
29	7,332,264 B2	Photo-definable self-assembled materials	Feb 19, 2008
28	6,983,093	Fluid Light Guide Having Hydrophobic Aerogel Cladding Layer	Jan 3, 2006
27	6,913,832	Prototyping of Patterned Functional Nanostructures	Jul 5, 2005
26	6,808,867 B2	Photo-Definable Self-Assembled Materials	Oct 26, 2004
25	6,536,604	Inorganic dual-layer microporous supported membranes	Mar 25, 2003
24	6,495,352	Sol-gel method for encapsulating molecules	Dec 17, 2002
23	6,471,761	Prototyping of patterned functional nanostructures	Oct 29, 2002
22	6,387,453	Method for making surfactant-templated thin films	May 14, 2002
21	6,270,846	Method for making surfactant-templated, high-porosity thin films	Aug 7, 2001
20	6,264,741	Self-assembly of nanocomposite materials	July 24, 2001
19	6,258,305	Method for net-shaping using aerogels	July 10, 2001
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14	5,858,457	Process to form mesostructured films	Jan 12, 1999
13	5,772,735	Supported inorganic membranes	Jun 30, 1998
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11	5,589,396	Coatings with controlled porosity and chemical properties	Dec 31, 1996
10	5,565,142	Preparation of high porosity xerogels by chemical surface modification	Oct 15, 1996
9	5,313,485	Luminescent light source for laser pumping and laser system containing same	May 17, 1994
8	5,240,647	Process for making solid-state radiation-emitting composition	Aug 31, 1993
7	5,224,972	Coatings with controlled porosity and chemical properties	July 6, 1993
6	5,151,110	Molecular sieve sensors for selective detection at the nanogram level	Sept 29, 1992
5	5,137,659	Solid-state radiation-emitting compositions and devices	Aug 11, 1992
4	5,122,305	Solid-state radiation-emitting compositions and devices	Jun 16, 1992
3	5,078,919	Composition containing aerogel substrate loaded with tritium	Jan 7, 1992
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O. Research Support

ACTIVE SUPPORT

1R01GM098736-01 (Jakobsson, UIUC; Brinker, UNM; Maloy UCSD), 9/1/2011 – 5/31/2015
NIH EUREKA

Development of Functional Protocells and Virus-Like Particles for Drug Resistant Bacteria

We plan to develop lipid coated inorganic nanoparticles (termed functional nanoparticles) and engineered virus-like particles (VLPs) as carriers to deliver antisense nucleic acids into drug-resistant bacteria cells as a novel way to treat bacterial infections.

LLS 7010-14 SCOR (Carroll NYU; Willman UNM), 10/1/2013 – 9/30/2018

Lymphoma Leukemia Society

Developing Novel Therapies for Pediatric and Young Adult ALL

Silica nanoparticles have recently received FDA approval for targeted molecular imaging in cancer; these studies will lay the foundation for FDA-reviewed IND-directed toxicology studies.

5 U01 CA151792-03 (Willman, Brinker/UNM), 9/1/2010 – 8/31/2015

NCI NIH

Peptide-directed Protocells and Virus-Like Particles – new nanoparticle platforms for targeted delivery of multicomponent cargos

This project will develop nanoparticle platforms to target delivery of a variety of different cargos to cancer cells.

1U19ES019528-01 (A. Nel, UCLA; Brinker UNM PI), 9/24/2010 – 4/30/2015

NIEHS (UCLA)

Center for Nanobiology and Predictive Toxicology

This Center will study how properties of engineered nanoparticles may lead to lung health effects by creating harmful interactions in cells and tissues that will come into contact with these materials.

165609 (Brinker, SNL), 10/1/2012 – 9/30/2015

Sandia National Labs – LDRD

The Engineering and Understanding of Nanoparticle/Cellular Interactions

The goal of this project is to design and fabricate next generation protocells that overcome multiple grand challenges of current nanocarrier platforms with respect to cargo capacity and diversity, circulation time, controlled release, targeting and cell-specific toxicity, and safety.

1198779 (Brinker, UNM), 2/1/2012 – 12/30/2015

Sandia National Labs – LDRD

New Biotic-Abiotic Materials and Interfaces

Direct research toward the creation of a new reductionist synthetic platform integrating protoells and molecular networks in which to conduct biochemical assays with subcellular structures and environments that recapitulate those of living systems.

KC0203010/93223 (P. Clem, SNL), 10/1/2013 – 9/30/2015

DOE BES/Division of Materials Science & Engineering

Molecular Nanocomposites

The goal of this project is to use molecular self-assembly in conjunction with atomic layer deposition to create nanocomposite materials and bio/nano interfaces for applications in energy.

0830117 (NeI, UCLA: Brinker UNM PI), 9/1/2009 – 8/31/2018

NSF ERC, EPA

Center for Environmental Implications of Nanotechnology (CEIN) Systematic Synthesis of Nanoparticles

The goal of this project is to develop a broad-based model of predictive toxicology premised on the quantitative structure-activity relationships and nanomaterial injury mechanisms at the biological level.

9550-1-14-066 (Brinker, UNM), 2/1/2014 – 1/31/2017

Air Force Office of Scientific Research

Biocompatible and Biomimetic Self-Assembly of Functional Nanostructures

Based largely on new classes of biotic/abiotic materials discovered and developed within the AFOSR program, we will (1) continue to study cellular immobilization within engineered 3D matrices, (2) to explore newly discovered silica cell replication, and (3) develop the protocell as a new platform for synthetic biology.

DE-FG02-02ER15368 (Brinker, UNM), 11/15/2012 – 11/14/2015

DOE/BES (NSET)

Catalytic and Transport Behaviors of Model Porous and Composite Nanostructures (Renewal)

The goal of this project is the design, synthesis and understanding of model self-assembled materials with controlled nanocomposite architectures for studies in catalysis and transport in model reactive separation systems.

NSF 12-269 (Datye, UNM), 4/15/2013 – 4/14/2016

NSF

REU Site: Research Experience for Undergraduates in NSMSE (renewal)

This continuation project will continue to provide mentoring and education in the applications of Nanoscience and Microsystems to materials science problems.

CB-SEED-25 (Carnes, SNL), 9/1/2013 – 3/31/2016

Defense Threat Reduction Agency Mesoporous Alum Nanoparticles as a Universal Platform for Antigen Adsorption, Presentation, and Delivery

We propose to synthesize high surface-area mesoporous alum nanoparticles (MANPs) that facilitate facile adsorption and presentation of antigens isolated from Category A and B biothreat agents. We will load MANPs with cocktails of antigen(s) and immunostimulatory RNA (isRNA) and encapsulate them within a supported lipid bilayer (SLB).

SNL) DTRA JSTO-CBD NATV (Brinker, SNL), 9/1/2013 – 8/31/2017

Defense Threat Reduction Agency

Development of a Mesoporous Silica Nanoparticle-Supported Lipid Bilayer Platform for Targeted, Triggered, Sustained, and Systemic Delivery of Antibiotics

We propose to develop mesoporous silica nanoparticle-supported lipid as a flexible, modular platform for targeted, triggered, sustained, and systemic delivery of a variety of FDA-approved antibiotics to cells, tissues, and organs infected with Gram-negative, facultative intracellular pathogens

NSF 13-518 INSPIRE (Y. Wang, UCSD; Brinker UNM PI), 9/1/2013 – 8/31/2018

NSF

Protocells as a Platform for Bottom-up Synthetic Biology

We propose to develop a proof-of-concept bottom-up cell utilizing the protocell - a single cell entity that will serve as a nanoscale machine capable of perceiving external environmental cues and guiding the regulation of signaling transduction and gene/protein production inside the cells.

Lutsgarden Foundation (Brinker, UNM) 8/1/2014 – 12/31/2015
Fred Hutchinson Cancer Center, Seattle, WA

Rapid in-situ Generation of Pancreatic Tumor Specific T-Cells using DNA nanocarriers
Pore surface chemistries will be modified with cationic or other ligands to enhance loading of customized cargos identified by FHCC.

Sponsored Research Agreement (Brinker, UNM) 8/1/2014 – 1/31/2016
Alpine Biosciences/Oncothyreon Inc

Protocell and Mesoporous Silica Nanoparticles for Cancer Therapeutics
The first phase of an anticipated multi-phase, multi-year project in collaboration with Alpine Biosciences will further develop our highly biocompatible and versatile nanoparticle platform technology, capable of delivering a broad range of cargo to specific target cells of different lineages in vivo.

PENDING

DOE DE-FOA-0001010, EFRC (Cox, UCD; Brinker, UNM) est 7/1/14-6/30/17

BESANE – Biologically Enabled Self Assembly for Novel Energy
DOE EFRC

We propose to create engineered porous scaffolds within which we can incorporate biomolecular machinery and upon which we can support synthetic or native membranes. These artificial cellular contracts will be used to transduce or harvest energy.

NSF BMAT (Pyle UCLA, Brinker UNM) est 7/1/14-6/30/17

Creating Silica Based Encapsulant Architectures for Modulating Cell Fate
NSF

We propose to extend strategies for synthesis of 3D cellular composite constructs to understand and enhance stem cell survival, expansion, and differentiation.