Jennifer N. Cha
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(I) Professional Preparation:

B.A.	1996	Developmental Cell Biology, University of California, Berkeley
M.S.	1998	Chemistry, University of California, Santa Barbara
Ph.D.	2001	Chemistry, University of California, Santa Barbara

(II) Appointments:

- September, 2008 – now: Assistant Professor, Department of Nanoengineering and Materials Science, University of CA, San Diego
- January, 2004 – August, 2008: Research Staff Member, IBM Almaden Research Center, San Jose, CA
- July, 2002- December, 2003: Postdoctoral Research Associate, University of CA, Berkeley
- January, 2001 - June, 2002: Postdoctoral Research Associate, University of CA, Santa Barbara

(III) Publication List

1. K. Shimizu, **J.N. Cha**, G.D. Stucky, D.E. Morse, "Silicatein a: Cathepsin L-like protein in sponge biosilica", Proc. Nat. Acad. Sci., 95, 6234-6238 (1998)

2. J.N. Cha, K. Shimizu, Y. Zhou, S.C. Christiansen, B.F. Chmelka, G.D. Stucky, D.E. Morse, "Silicatein filaments and subunits from a marine sponge direct the polymerization of silica and silicones in vitro", Proc. Nat. Acad. Sci., 96, 361-365 (1999)

3. Y. Zhou, K. Shimizu, **J.N. Cha**, G.D. Stucky, D.E. Morse, "Efficient catalysis of polysiloxane synthesis by silicatein a requires specific hydroxyl and imidazole functionalities", Angew. Chem. Int. Ed., 38, 780-782 (1999)

4. J.N. Cha, K. Shimizu, Y. Zhou, T.J. Deming, G.D. Stucky, D.E. Morse, "Learning from Nature: Novel Routes to Biomimetic Synthesis of Silica Structures", MRS Symposium (Mineralization in Natural and Synthetic Biomaterials, Boston, November 1999)

5. J.N. Cha, G.D. Stucky, D.E. Morse, T. J. Deming, "Block Copolypeptide Mediated Biomimetic Synthesis of Ordered Silica Structures", Nature, 403, 289-292 (2000)

6. J.N. Cha, M.S. Wong, K.S. Choi, T. J. Deming, G. D. Stucky, "Assembly of Nanoparticles into Hollow Spheres Using Block Copolypeptides", Nanoletters, 2, 583-587 (2002)

7. J. N. Cha, M.H. Bartl, M.S. Wong, A. Popitsch, T.J. Deming, G. D. Stucky, "Microcavity Lasing from Block Peptide Hierarchically Assembled Quantum Dot Spherical Resonators", Nanoletters, 3, 907-911 (2003)

8. J.N. Cha, H. Birkedal, L.E. Euliss, M. H. Bartl, M.S. Wong, T.J. Deming, G.D. Stucky, "Spontaneous Formation of Nanoparticle Vesicles from Homopolymer Polylectrolytes", J. Am. Chem. Soc., 125, 8285-8289 (2003)

9. V.S. Murthy, **J.N. Cha**, G.D. Stucky, M.S. Wong, "Charge-Driven Flocculation of Poly(L-lysine)-Gold Nanoparticle Assemblies Leading to Microspheres", J. Am. Chem. Soc., 126, 5292-5299 (2004)

10. A. Fu, C.M. Micheel, **J. N. Cha**, H. Chang, H. Yang, A.P. Alivisatos, "Discrete Nanostructures of Quantum Dots/Au with DNA", J. Am. Chem. Soc., 126, 10832-10833 (2004)

11. T. Magbitang, V.Y. Lee, **J.N. Cha**, H.-L. Wang, R.W. Chung, R.D. Miller, G. Dubois, W. Volksen, H.-C. Kim, J.L Hedrick, "Oriented nanoporous lamellar organosilicates templated from topologically unsymmetrical dendritic-linear block copolymers", Angew. Chem. Int. Ed., 44, 7574-7580 (2005)

12. E. M. Freer, L. E. Krupp, W.D. Hinsberg, P. M. Rice ; J.L. Hedrick, **J.N. Cha**, R.D. Miller, H.-C. Kim, "Oriented Mesoporous Organosilicate Thin Films", Nanoletters, 5, 2014-2018 (2005)

13. E. M. Freer, **J.N. Cha**, J.L. Hedrick, R.D. Miller, H.-C. Kim, "Nanostructured organosilicates from self-assembled block copolymer / silsesquioxane mixtures", PMSE Preprints, 92, 69-70. (2005)

14. B. Gigliotti, B. Sakizzie, D.S. Bethune, R.M. Shelby, **J.N. Cha***, "Sequence-Independent Helical Wrapping of Single-Walled Carbon Nanotubes by Long Genomic DNA", Nanoletters, 6, 159-164 (2006)

15. B. Parrish and **J. N. Cha***, "Peptide end-functionalized block copolymers prepared by reversible addition-fragmentation chain transfer polymerization". PMSE Preprints, ACS, 47, 588 (2006)

16. D.A. LaVan and **J.N. Cha***, "Approaches for biological and biomimetic energy conversion", Proc. Natl. Acad. Sci., 103, 5251-5255 (2006)

17. J.N. Cha*, Y. Zhang, H.-S. P. Wong, S. Raoux, C. Rettner, L. Krupp, V. Deline, "Biomimetic Approaches for Fabricating High-Density Nanopatterned Arrays", Chem. Mater., 19, 839-843 (2007)

18. Y. Zhang, H.-S. P. Wong, S. Raoux, **J.N. Cha**, C.T. Rettner, L.E. Krupp, T. Topuria, D.J. Milliron, P.M. Rice, J.L. Jordan-Sweet, "Phase change nanodot arrays fabricated using a self-assembly diblock copolymer approach" Appl. Phys. Lett., 91, 131041-131043, (2007)

19. C. Buie, A. Fornoff, C.M. Micheel, **J.N. Cha***, "Directed assembly of gold nanoparticles on modified DNA origami", Polymer Preprints ACS, 49(1), 1117-1118, 2008

20. J.W. Galusha, L.R. Richey, J.S. Gardner, **J.N. Cha**, M.H. Bartl, "Discovery of a diamond-based photonic crystal structure in beetle scales" Phys. Rev. E, 77(5-1), 2008

21. B. Atmaja, **J.N. Cha**, A. Marshall, C.W. Frank, "Supramolecular Assembly of Block Copolypeptides with Semiconductor Nanocrystals" Langmuir, 25, 707-715, 2009

22. B. Atmaja, **J.N. Cha**, C.W. Frank, "Adsorbed a -Helical Diblock Copolypeptides: Molecular Organization, Structural Properties, and Interactions", Langmuir 25, 865-872, 2009

23. R. Kershner, L. Bozano, C.M. Micheel, A. Hung, A. Fornoff, **J.N. Cha**, C. Rettner, M. Bersani, J. Frommer, P.W.K. Rothemund, G. Wallraff, "Placement and orientation of DNA nanostructures on lithographically patterned surfaces", in review (Nature Nanotechnology)

24. A. Hung, C.M. Micheel, L.D. Bozano, L.W. Osterbur, G.M. Wallraff, **J.N.Cha***, "Spatially-Directed Assembly of Gold Nanoparticles on Lithographically Patterned DNA Origami", in review (Nature Nanotechnology)

25. H.Noh, H. Noh, A.M. Hung, C. Choi, J.H. Lee, J.-Y. Kim, S. Jin, **J.N. Cha*** 50nm DNA Nanoarrays Generated from Uniform Oligonucleotide Films, *in review*, **2009**

* corresponding author

(IV) Patents

1. International Patent Publication Number: WO 00/35993
"Methods, Compositions, and Biomimetic Catalysts for in vitro Synthesis of Silica, Polysilsequioxane, polysiloxane, and polymetallo-oxanes", Morse, D.E., Stucky, G.D., Deming, T.J., Cha, J.N., Shimizu, K., Zhou, Y., University of CA Santa Barbara

2. International Patent Publication Number: WO 02/84271
"Methods and Sensors for Luminescent and Optoelectronic Detection and Analysis of Polynucleotides", J.N. Cha, G.D. Stucky, D.E. Morse, University of CA, Santa Barbara

3. US Patent Publication Number: US 2003/082237
"Nanoparticle Assembled Hollow Spheres of Block Polypeptides", J.N. Cha, T.J. Deming, G.D. Stucky, M.S. Wong, H. Birkedal, M.H. Bartl, J.L. Sumerel, University of CA, Santa Barbara

4. U.S. Patent Publication Number: US 2006/241194
"Nanoporous media templated from unsymmetrical amphiphilic porogens", J.N. Cha, G. J-M. Dubois, J.L Hedrick, H.-C. Kim, V. Y.-W. Lee, T.P. Magbitang, R.D. Miller, W. Volksen, IBM

5. U.S. Patent Publication Number: US 2006/240240
"Nanoporous organosilicate media with lamellar structures", J.N. Cha, G. J.-M. Dubois, J.L. Hedrick, H.-C. Kim, V. Y.-W. Lee, T.P. Magbitang, R.D. Miller, W. Volksen, IBM

6. International Patent Publication Number: WO 07/057263
"Water castable-water strippable topcoat for immersion lithography", P.J. Brock, J. Cha, D. Gil, C.E. Larson, L.K. Sundberg, G. Wallraff, IBM

7. U.S. Patent Publication Number: US 2009/057623
"DNA-based functionalization of single walled carbon nanotubes for directed assembly", J.N. Cha, C.M. Micheel

(V) Synergistic Activities

- Organizer/Chair, "Nanowires and Nanotubes for Sensing" FACSS 2006
- Member of Faculty of 1000 Biology-bioinorganic division,
- Seed member of NSF MRSEC, Center on Polymer Interfaces and Macromolecular Assemblies (CPIMA) and Co-coordinator of IRG 2 for CPIMA renewal (2007)
- Development and integration of undergraduate and graduate level courses within the newly established Nanoengineering department at UCSD (within Jacobs School of Engineering)

- Faculty host/presenter at the UCSD San Diego Science Festival, Small Wonders, April 2009
- Active proposal reviewer for NSF, DOE LBNL Molecular Foundry
- Active journal reviewer (JACS, Chemistry of Materials, Nanoletters, Small, Advanced Materials)
- NSF Panel Review, 2009
- ET-CURE Faculty Member, Moores UCSD Cancer Center, UC San Diego, 2009

(VI) Collaborators and Other Affiliations

- Prof. Sadik Esener, Electrical Engineering Department, UCSD, San Diego, CA
- Prof. Sungho Jin, Nanoengineering Department, UCSD, San Diego, CA
- Prof. Michael Bartl, Chemistry Department, University of Utah, Salt Lake City, Utah
- Prof. Curt Frank, Chemical Engineering Department, Stanford University, Stanford, CA
- Prof. Shalom Wind, Applied Physics Department, Columbia University, New York, NY
- Professional Affiliations: American Chemical Society
  Materials Research Society

(VII) Graduate and Postdoctoral Advisors

Graduate: Professors Galen Stucky, UC Santa Barbara
Professor Daniel E. Morse, UC Santa Barbara
Professor Timothy J. Deming, UC Santa Barbara
Postdoctoral: Professor Galen D. Stucky, UC Santa Barbara
Professor Paul Alivisatos, UC Berkeley

(VIII) Thesis Advisor and Postgraduate Sponsor (4 graduate students, 3 postdoctoral advisors)

Current: Mr. Ju-Hun Lee (UCSD), Mr. Hyunwoo Noh (UCSD), Ms. Lauren Forbes (UCSD), Ms. Yue Shi (UCSD), Ms. Emi Nakayama (UCSD), Dr. Albert Hung (UCSD), Mr. Bayu Atmaja (Stanford University)

Former (while at IBM): Ms. Brittany Gigliotti (B.S., 2006), Ms. Brenda Sakizzie (B.S., 2006), Ms. Vivan Ng (M.S., 2006), Mr. Caesar Buie (B.S., 2008), Mr. Lucas Obsterbur (B.S. 2009), Dr. Bryan Parrish (Ph.D. UMass, now at Clorox), Dr. Christine Micheel (Ph.D. UC Berkeley, now at National Academy of Science), Dr. Albert Hung (Ph.D. Northwestern, currently at UCSD)

(IX) Awards/Honors/Professional Activities

- IBM Innovation Research Award, 2005-2007
- IBM Research Division Award, 2004
- Organizer/Chair, "Nanowires and Nanotubes for Sensing" FACSS 2006
- Invited workshop participant of 2nd National Academices Keck Future Initiative, “Designing Nanostructures Conference”, 2004
- Invited speaker/participant of 3rd NASA-NIST workshop on Nanotube Measurements, 2007
- Invited speaker/participant of EU-US Workshop on Nanobiotechnology, Ispra, Italy, 2008
- Keynote speaker, Nanothailand 2008, Bangkok, Thailand
- Nominee to attend NAE Frontiers of Engineering Symposium (final decisions made 6-2009)
- Hellman Faculty Fellow Award, 2009

(X) Invited Talks

1. ***Invited*** Talk, June 5, 2000: Conference, "Society for Experimental Mechanics, Inc.", Orlando, FL
2. ***Invited*** Talk, August 15, 2000: "Gordon Research Conference, Biomineralization", New Hampshire

3. ***Invited*** Talk, December 16, 2000: "American Chemical Society, 2000", Honolulu, HI
4. ***Invited*** Talk, January 18, 2001: Pacific Northwest National Laboratories, Batelle, Richland, WA
5. ***Invited*** Talk, May 8, 2001: "Bio-inspired Materials", University of Minnesota, Twin Cities, Minneapolis, MN
6. ***Invited*** Talk, March 6, 2002: "Biomimetic Engineering", Destin, FL
7. ***Invited*** Talk, March 10, 2002: "Soft Solution Processing", Schloss Ringberg, Germany
8. ***Invited*** Talk, July 7, 2004, NASA/AMES Workshop, July 7, 2004,
9. ***Invited*** Chair of *Tissue Engineering and Biomineralization* session, Frontiers of Chemistry, Kloster Seeon, Germany, July 16, 2004
10. ***Invited*** Poster, Frontiers of Chemistry, Kloster Seeon, Germany, July 16, 2004
11. ***Invited*** participant, National Academies Keck Future Initiative, "Designing Nanostructure Pre-Conference", Sept. 18-19, 2004
12. ***Invited*** Poster, Presenter, Workshop Participant, National Academices Keck Future Initiative, "Designing Nanostructures Conference", November 18-21, 2004
13. ***Invited*** Seminar, Berkeley Nanoscience and Nanoengineering Institute (BNNI) & Bioengineering Dept, University of CA, Berkeley, April 11, 2005
14. ***Invited*** Presentation, "The Future of Global Manufacturing, Nanotechnology", Santa Clara Convention Center, May 2006
15. ***Invited*** Presentation, "US-Japan Nano-Hybrid Conference", Monterey, CA, May 2006
16. ***Invited*** Presentation, "CPIMA Forum" Stanford University, August 10 2006
17. ***Invited*** Presentation, "Carbon Nanotube Separation, FACSS 2006", Orlando, Fl, Sept 2006
18. ***Invited*** Presentation, "30th Annual Symposium, Macromolecular Science and Engineering", University of Michigan, Oct 2006
19. ***Invited*** Presentation, "Materials Research Outreach Symposium", University of CA, Santa Barbara, January 2007
20. ***Invited*** Presentation, "Applications of Nanotubes and Nanowires", Materials Research Society Meeting, SF, CA, April 2007
21. ***Invited*** Presentation, "Polymers-East", Gordon Research Conference, June 2007
22. ***Invited*** Presentation, "3rd NASA-NIST Workshop on Nanotube Measurements", September 26-28, 2007, Gaithersburg, MD
23. ***Invited*** Presentation, "Opportunities for Nanostructured Polymeric Materials for Device Fabrication", Lake Tahoe, NV, Nov 4-8, 2007
24. ***Invited*** Attendee, "IBM Global Technical Leadership Exchange", Orlando, FL, April 6-9, 2008
25. ***Invited*** Presentation, NSTI Nanotech 2008, Nanostructured Surfaces and Interfaces, Boston, MA, June 1-5, 2008
26. ***Invited*** Presentation, International Workshop on Nanobiotechnology, Ispra, Italy, June 3-4, 2008
27. ***Invited*** Presentation, "Nanostructure Fabrication", Gordon Research Conference, July 2008
28. ***Invited*** Presentation, BNNI, UC Berkeley, October 31, 2008
29. ***Invited*** Keynote Speaker, NanoThailand Symposium 2008, Bangkok, Thailand, November 2008
30. ***Invited*** Speaker, Columbia University, November 2009
31. ***Invited*** Presentation, Materials Research Society Spring Meeting, April 2010

32. ***Invited*** Presentation, International NanoBio 2010 Conference, 24 – 27 August 2010, ETH Zurich.

(XI) Funding

Current Support
1. Title: Engineering pH-Responsive siRNA Delivery Systems
Agency: UCSD, General Campus
Time Period: 1/1/09-1/1/10 Award Amount: $10,000
Investigator: Jennifer Cha (PI)

2. Title: Lithographically Directed Biomolecular Assembly of Electronically Functional Nanostructures for Sub-10nm Electron Devices
Agency: Office of Naval Research
Time Period: 2/1/09-2/1/11 Award Amount: $247,653 (Total award: $1,100, 000)
Investigators: Jennifer Cha (Co-PI)
Person-Months Per Year: 0.00 (Academic); 1.00 (Summer)

3. Title: Low-Cost, Manufacturable Approaches for Wafer-Level Generation of Nanoscale Device Arrays
Agency: NSF
Time Period: 04/01/09-03/31/12 Award Amount: $450,000
Investigators: Jennifer Cha (PI), Sungho Jin (Co-PI)
Person-Months Per Year: 0.00 (Academic); 1.00 (Summer)

Pending

1. Title: Mimicking Biomineralization: Benign Chemistry Routes for Synthesizing Platinum Nanocrystal Catalysts for Fuel Cell Applications
Agency: Department of Energy
Time Period: 01/01/10-01/01/13 Award Amount: $750,000
Investigator: Jennifer Cha (PI)
Person-Months Per Year: 0.00 (Academic); 1.00 (Summer)

2. Title: NanoEncapsulated BioSensors For Microscopy
Agency: NSF
Time Period: 10/01/09-10/01/12 Award Amount (Total): $ $1,985,400
Investigator: Jennifer Cha (Co-PI)
Person-Months Per Year: 0.00 (Academic); 0.5 (Summer)

3. Title: Manufacturable Approaches for Nanometer Resolution Patterning
Agency: DARPA
Time Period: 09/01/09-8/31/11 Award Amount: $300,000
Investigator: Jennifer Cha (PI)
Person-Months Per Year: 0.00 (Academic); 1.00 (Summer)

4. Title: Enzyme Mediated Activation of Targeted Microbubbles
Agency: NIH
Time Period: 09/30/09-09/29/11 Award Amount (Total): $1,000,000
Investigator: Jennifer Cha (co-PI)
Person Months Per Year: 0.00 (Academic); 1.00 (Summer)

5. Title: Smart and bio-responsive drug delivery systems with remote on-off control
Agency: NIH
Time Period: 09/30/09-09/29/11 Award Amount (Total): $1,000,000
Investigator: Jennifer Cha (co-PI)
Person Months Per Year: 0.00 (Academic); 1.00 (Summer)