

BIOGRAPHICAL SKETCH

Seung-Wuk Lee, Ph. D.

Professor, Department of Bioengineering,
University of California, Berkeley, Berkeley, CA 94720
Phone: 510-486-4628, fax: (510) 486-6488
E-mail: leesw@berkeley.edu, <http://leelab.berkeley.edu>

Education and Training

The University of Texas at Austin	Chemistry and Biochemistry	Ph. D. 2003
Korea University, Seoul, Korea	Organic Chemistry	M. S. 1997
Korea University, Seoul, Korea	Chemistry	B. S. 1995

Research and Professional Experience

University of California, Berkeley	Professor, Bioengineering	2015-present
University of California, Berkeley	Associate Professor, Bioengineering	2011-2015
University of California, Berkeley	Assistant Professor, Bioengineering	2006- 2011
Center of Integrated Nanomechanical Systems, UCB, Associate Director		2009-2014
Lawrence Berkeley National Lab	Scientist, Physical Bioscience Division	2006-present
Lawrence Berkeley National Lab	Postdoctoral Fellow, Molecular Foundry	2004-2005
Samsung	Associate, Display Device Div.	1997-1998

SELECTED PUBLICATIONS

1. Jin, H.-E., Jang, Zueger, C., Wong, W., Chung, W.-J., Lee, B.-Y., **Lee, S.-W.** Selective and Sensitive Sensing of Flame Retardant Chemicals Through Phage Display Discovered Recognition Peptide. *Nano Letters*. doi: 10.1021/acs.nanolett.5b03678. (2015).
2. Jin, H.-E., Jang, J., Chung, J., Lee, H. J. Lee, Wang, E., **Lee, S.-W.**, Chung, W.-J. Biomimetic Self-Templated Hierarchical Structures of Collagen-like Peptide Amphiphiles, *Nano Letters*. doi:10.1021/acs.nanolett.5b03313. (2015).
3. Oh, J.-W., Chung, W.-J., Heo, K, Jin, H.-E., Lee, B.-Y., Wang E., Meyer, J., Kim C., Lee, S.-Y., Kim, W.-G., Zemla, M, Auer, M , Hexemer, A, and **Lee, S.-W.**, Biomimetic Virus-Based Colourimetric Sensors, *Nature Communication* **5**, Article number: 3043 (2014).
4. Jin, H.-E., Farr, R., **Lee, S.-W.**, Collagen mimetic peptide engineered M13 bacteriophage for collagen targeting and imaging in cancer, *Biomaterials*, **35**, 9236 (2014)
5. Wang, E., Desai, M., **Lee, S.-W.**, Light-Responsive Graphene-Elastin Hydrogel Actuator, *Nano Lett.* **13**, 2826 (2013).
6. Gutes A, Lee BY, Carraro C, Mickelson W, **Lee S.-W.**, & Maboudian R. Impedimetric graphene - based biosensor for the detection of polybrominated diphenyl ether *Nanoscale* **5**, 6048, (2013).
7. Lee, B.-Y., Zheng, J., Zueger, C., Chung, W.-J., Yoo, S.-Y., Wang, E., Meyer, J., Ramesh, R., **Lee, S.-W.**, Virus-based Piezoelectric Energy Generation. *Nature Nanotechnology*. **7**, 351 (2012).
8. Bhattarai, S., Yoo, S.-Y., **Lee, S.-W.**, Dean, D., Engineered phage-based therapeutic materials inhibiting *Chlamydia trachomatis* intracellular infection. *Biomaterials* **33**, 5166-5174 (2012).
9. Chung, W.-J., Oh, J.-W., Kwak, K.-W., Lee, B.-Y., Mayer, J., Wang, E., Hexemer, A., & **Lee, S.-W.** Biomimetic Self-Templating Supramolecular Structures. *Nature* **478**, 364 -368 (2011).
10. Kim TH, Lee BY, Jaworski J, Yokoyama K, Chung WJ, Wang E, Hong SH, Majumdar A, & **Lee, S.-W.** Selective and Sensitive Trinitrotoluene CNT-FET Sensors Using Conjugated Lipid-like Polymer Nanocoatings. *ACS Nano*. **5** (4), 2824-2830, (2011).
11. Yoo SY, Merzlyak AM, & **Lee, S.-W.** Facile Growth Factor Immobilization Platform Based on Engineered Phage Matrices. *Soft Matter*. **7**, 1660-1666, (2011).

12. Kwon KY, Wang E, Nofal M, & **Lee, S.-W.** Microscopic Study of Hydroxyapatite Dissolution as Affected by Fluoride Ions. *Langmuir*. 27 (9), 5335-5339, (2011).
13. Yoo SY, Kobayashi M, Lee PP, & **Lee, S.-W.** Early osteogenic differentiation of bone stem cell induced by collagen-derived DGEA peptide on nanofibrous phage tissue matrices *Biomacromolecules*. 12 (4), 987-996, (2011).
14. Chung WJ, Kwon KY, Song J, & **Lee, S.-W.** Evolutionary screening of collagen-like peptides that nucleate hydroxyapatite crystals *Langmuir*. 27 (12), 7620–7628 (2011).
15. Jaworski J, Yokoyama K, Zueger, C, Chung WJ, Majumdar A, & **Lee, S.-W.** Polydiacetylene Incorporated with Peptide Receptors for Detection of Trinitrotoluene Explosives. *Langmuir*. 27 (6), 3180-3187, (2011).
16. Wang E, Lee SH, & **Lee, S.-W.** Elastin-Like Polypeptide Based Hydroxyapatite Bionanocomposites. *Biomacromolecules*. 12 (3), 672-680 (2011).
17. Yoo SY, Chung WJ, Kim TH, Le M, & **Lee, S.-W.** Facile patterning of genetically engineered M13 bacteriophage for directional growth of human fibroblast cells. *Soft Matter*. 7 (2), 363-368, (2011).
18. Merzlyak A, Indrakanti S, & **Lee, S.-W.** Genetically Engineered Nanofiber-Like Viruses For Tissue Regenerating Materials. *Nano Letters*. 9 (2), 846-852, (2009).
19. Jaworski JW, Raorane D, Huh JH, Majumdar A, & **Lee, S.-W.** Evolutionary Screening of Biomimetic Coatings for Selective Detection of Explosives. *Langmuir*. 24 (9), 4938-4943, (2008).
20. **Lee, S.-W.**; Mao, C.; Flynn, E. C.; Belcher, A. M. Ordering of Quantum Dots Using Genetically Engineered Viruses. *Science* 2002, 296, 892-895.

AWARDS & HONORS

- One of 12 Highlights for President Obama's US Congress report for the NSF (2014)
- Samsung GRO Award (2013, 2015)
- R&D 100 Awards (2013)
- One of the 17 breakthrough of the 2012 Scientific Discovery (iO9 Committee; 2012).
- Berkeley Faculty Research Fund Award, University of California, Berkeley (2010)
- Presidential Chair Fellows, University of California, Berkeley (2009)
- National Science Foundation CAREER Award (2008-2013)
- Hellman Foundation Faculty Award (2008)
- First place in MRS 2007 Spring Meeting Top 5 Hot Talk/Cool Papers among 3300 papers (April, 2007)
- Annual Nanotech Briefs' Nano50 award; Innovator Categories (2005).
- Gold Award in MRS 2002 Fall Meeting Graduate Student Competition (December, 2002).
- Best Poster Award at 2002 Spring Materials Research Society Meeting (April, 2002).
- Best Employee Honor by Samsung Electronics (Display Device Division) (1998).

Synergistic Activities

1. I organized multiple international conferences including the Fall MRS (Boston, MA, 2007), UC System Bioengineering Conference (Berkeley, CA, 2012), International Conference in Bioengineering and Nanotechnology (Berkeley, CA, 2012), and Japanese Materials Research Society (Kyoto, Japan, 2013), Fall MRS 2014 (Symposium F: Reverse Engineering of Bio-inspired Nanomaterials (Boston, MA, 2014)), and will organize a session in MRS 2016 (Phoenix, Az).
2. I have reviewed more than 100 proposals for NSF, DOE, ARO, Canadian, UK, Switzerland, and Netherland Science Foundation, 60 proposals for the Molecular Foundry, Lawrence Berkeley National Laboratory.
3. I edited *MRS Conference Proceeding* in 2007 Fall Meeting, and reviewed more than 100 manuscripts for *Nature*, *Science*, *Nature Nanotech.*, *Nature Materials*, *Nature Comm.*, *Chemical Review*, *Nano Letters*, *JACS*, *Langmuir*, and etc.
4. I developed material for new engineering courses entitled "Introduction of Bio-Nanoscience and Bio-Nanotechnology", "Quantitative Biochemistry", and "Introduction of Nanoscale Materials".

Collaborators & Other Affiliations

Collaborators and Co-Editors: Drs. Ramamoorthy Ramesh (UC Berkeley, CA), Roya Mabodian (UC Berkeley, CA), James De Yoreo (PNNL, WA), Deborah Dean (Oakland Children's Hospital, Oakland, CA), Arun Majumdar (Stanford), Seunghun Hong (Seoul National Univ., Korea), In-Geol Choi (Korea Univ., Korea), Edward Perkins (ERDC), and Harm-Anton Klok (EPFL, Switzerland), Eric Grelet (CNRS, France).

Graduate Advisors and Postdoctoral Sponsors:

Prof. Carolyn Bertozzi	University of California, Berkeley	Postdoctoral adviser
Prof. Angela Belcher	Massachusetts Institute of Technology	Ph. D. adviser
Prof. Jung-Il Jin	Korea Univ. Seoul, S. Korea	MS Adviser

Thesis Advisor and Postgraduate-Scholar Sponsor: I have advised 5 graduate students, 27 undergraduate students and 8 postdoctoral scholars so far.

Postdoctoral scholars: Drs. Ki-Young Kwon (Professor, Chemistry, Gyoungsang Univ., Korea), Jonathan Phillips (Research Fellow at MedImmune, UK), Tae Hyun Kim (Professor, Chemistry, Sunchunhyang Univ., Korea), So-Young Yoo (Professor, Pusan Univ., Korea), Byung-Yang Lee (Professor, Korea Univ.), Jin-Woo Oh (Professor, Pusan Univ., Korea), Kyoung-Won Kwak (Professor, Chungang Univ., Korea), Woo-Jae Chung (Professor, Sungkyunkwan Univ., Korea), Kwang Heo (Sejong Univ., Korea).

Students (Graduate Students): Drs. Justyn Jaworski (Professor at Hanyang Univ., Korea), Anna Merzlyak (Siluria Inc.), Eddie Wang (Postdoc, UC Berkeley), Christopher Zueger (Middleton Research, WI), Dongshin Choi (KAIST, Korea).

Visiting Scholars: Professors Sungjee Kim (Postech, Korea), Ki-Young Kwon (Gyoung Sang Univ), Kyu-Won Kim (Incheon Univ.), Kyoung-Yeol Paik (KIST), In Geol Choi (Korea Univ.), Yokoyama Keisuke (NSK, Japan), Joel Meyer (Ecole Supélec, France), Yohan Farous (Ecole Polytechnique, France)

Current Students: Currently advising 6 graduate students, 2 postdocs and 3 undergraduates

Graduate students: Malav Desai, Ray Chiu, Benson Fan, Steven Tom, Snadya Lyer, I-Chin Wu, Mingle Tong.

Postdoctoral Fellows: Hyo-Eon Jin (Ph. D. in Pharmacy, SNU, Seoul, Korea), Ju-Hun Lee (Ph. D. in Material Sci. & Eng., UCSD).

Undergraduate students: Amanda Vu, Rodger Yuan, Kyle Joyner.
Also advised over 35 undergraduate researchers.

Brief Bio: Professor Lee earned his B.S and M.S. from Korea University (Seoul) and his Ph.D. from the University of Texas at Austin (2003). After a postdoctoral fellowship at Lawrence Berkeley National Lab, he joined a faculty position at UC Berkeley in 2006, was promoted to Associate Professor (2011) with tenure, a full professor (2015). He is also Associate Director of the Center of Integrated Nanomechanical Systems at UCB and Scientist, LBNL Physical Bioscience Division. The Lee group uses chemical and biological approaches to create precisely defined nanomaterials, to investigate complex phenomena at their interfaces, and to develop novel, biomimetic, functional materials. Among other awards, Professor Lee is R&D 100 Award (2013) and an NSF CAREER awardee. Dr. Lee's on going research was chosen as one of 12 highlight researches chosen by the President Obama's National Science Foundation Report for the US Congress entitled "Manufacturing Goes Viral" (2014) and chosen as one of top five Future Nanomanufacturings by *Scientific American* (2013).

