LUKE P. LEE

Arnold and Barbara Silverman Distinguished Professor

Director, Biomedical Institute for Global Healthcare Technology

Co-Director, Berkeley Sensor & Actuator Center

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Joined UC Berkeley Faculty in 1999

Education

1996 B.A., UC Berkeley, Biophysics

2000 Ph.D., UC Berkeley, Applied Science & Technology: *Applied Physics (major) & Bioengineering (minor)*

Major Awards and Honors

TRW Roll of Honor (1989), Distinguished Achievement Award of *TRW* (1990), The Regents Fellowship (1996), Doorae Fellowship (1998), Pacific Northwestern National Laboratory Fellowship (1998), The Regents' Junior Faculty Fellowship (2000), Selected to participate on Frontiers of Engineering Symposium, National Academy of Engineering (2000 & 20003), Researcher of the Year Finalist by Small Times (2002), NSF Career Award (2003), Lester John and Lynne Dewar Lloyd Distinguished Professorship (2005), Chair Professorship in Systems Nanobiology (2006), Siebel Scholar Award (2009), IEEE The William J. Morlock Award for Excellence in Biomedical Technology (2009), Human Frontier Science Program Award (with Chambers, Schroeder, and Wandless) (2010), Arnold and Barbara Silverman Distinguished Professorship (2010), Fellow of Royal Society of Chemistry (2010), and the HoAm Prize (2010).

Research Interests

Bionanoscience, Biophotonics, Quantum Nanoplasmonics, Satellite Molecular Imaging of Living Cells, Optical Gene Regulations, Single Cell Analysis, Cell Reprogramming, Molecular Diagnostics on Chip, Preventive Personalized Medicine, and Biologically-inspired Photonics Optofluidics Electronics Technology & Science (BioPOETS): *Biologically Inspired Self-Activated Building Envelope Regulation System (SABERS), Solar Optics-based Active Pasteurization (SOAP) for Greywater Reuse and Integrated Thermal Building Control.*

Professional Experience

1986-1990	Member of Technical Staff, *TRW* Space & Technology, Redondo Beach, CA
1990-1996	Member of Technical Staff, Conductus Inc., Sunnyvale, CA
1999-2004	Assistant Professor, Bioengineering, UC Berkeley
2004-2005	Associate Professor, Bioengineering, UC Berkeley
1999-present	Co-Director, Berkeley Sensor & Actuator Center, UC Berkeley
2001-2009	Director, Biomolecular Nanotechnology Center, UC Berkeley
2005-present	Professor, Bioengineering, UC Berkeley
2006-2007	Chair Professor of Systems Nanobiology, ETH Zürich
2005-2010	Lester John and Lynne Dewar Lloyd Distinguished Professor, UC Berkeley
2010-present	Arnold and Barbara Silverman Distinguished Professor, UC Berkeley

Selected Publications (*Selected from 230 peer-reviewed publications*)

Liz Y. Wu, Benjamin M. Ross, SoonGweon Hong, and Luke P. Lee, "Bioinspired Nanocorals with Decoupled Cellular Targeting and Sensing Functionality," *Small,* **6**, 4, 503-507 (2010).

Somin E. Lee, Gang L. Liu, Franklin Kim, Luke P. Lee, Remote Optical Switch for Localized and Selective Control of Gene Interference, *Nano Letters,* 9 (2), 562–570 (2009).

Yeonho Choi, Younggeun Park, Taewook Kang, and Luke P. Lee, "Selective and sensitive detection of metal ions by plasmonic resonance energy transfer-based nanospectroscopy," *Nature Nanotechnology*, 4, 742-746 (2009).

Yeonho Choi, Taewook Kang, Luke P. Lee, Plasmon Resonance Energy Transfer (PRET)-based Molecular Imaging of Cytochrome c in Living Cells, *Nano Letters,* 9 (1), pp 85–90 (2009).

Somin Eunice Lee, Darryl Y. Sasaki, Thomas D. Perroud, Daniel Yoo, Kamlesh D. Patel, and Luke P. Lee, "Biologically Functional Cationic Phospholipid-Gold Nanoplasmonic Carrier of RNA," *J. Am. Chem. Soc.,* 131, 14066-14074 (2009).

Gang Logan Liu, Yi-Tao Long, Yeonho Choi, Taewook Kang and Luke P. Lee, "Quantized Plasmon Quenching Dips Nanospectroscopy via Plasmon Resonance Energy Transfer," *Nature Methods*, 4, 1015-1017 (2007).

Ki-Hun Jeong, Jaeyoun Kim, Luke P. Lee, "Biologically Inspired Artificial Compound Eyes," *Science*, vol. 312, p. 557-561 (2006).

Gang L. Liu, Jaeyoun Kim, Yu Lu, and Luke P. Lee, "Optofluidic Control using Photothermal Nanoparticles," *Nature Materials*, 5, 27-32 (2006).

David N. Breslauer, Philip J. Lee, and Luke P. Lee, "Microfluidic-based Systems Biology," *Molecular BioSystems*, 2, 97-112 (2006).

Dino Di Carlo, Liz Y. Wu, Luke P. Lee, "Dynamic single cell culture array," *Lab on a Chip*, 6, 1445-1449 (2006).

Dino Di Carlo, Nima Aghdam, Luke P. Lee, "Single-cell Enzyme Concentrations, Kinetics, and Inhibition Analysis Using High density Hydrodynamic Cell Isolation Arrays," *Analytical Chemistry*, 78(14), 4925-4930 (2006).

Philip J. Lee, Paul J. Hung, Vivek M. Rao, Luke P. Lee, "Nanoliter Scale Microbioreactor Array for Quantitative Cell Biology," *Biotechnology & Bioengineering*, 94 (1), 5-14 (2006).

Poorya Sabounchi, C. Ionescu-Zanetti, R. Chen, M. Karandikar, J. Seo, and Luke P. Lee, "Soft-state Biomicrofluidic Pulse Generator for Single Cell Analysis," *Appl. Phys. Lett.* 88, 183901 (2006).

Gang L. Liu, Yadong Yin, Siri Kunchakarra, Bipasha Mukherjee, Daniele Gerion, Stephen D. Jett, David G. Bear, Joe W. Gray, A. Paul Alivisatos, Luke P. Lee, and Fanqing Frank Chen, "A nanoplasmonic molecular ruler for measuring nuclease activity and DNA footprinting," *Nature Nanotechnology*, 1, 47-52 (2006).

Adrian Y. Lau, Paul J. Hung, Angela R. Wu, and Luke P. Lee, "Open-access microfluidic patch-clamp array with raised lateral cell trapping sites," *Lab on a Chip*, 6, 1510 (2006).

Luke P. Lee and Robert Szema, "Inspirations from Biological Optics for Advanced Photonic Systems," *Science*, vol. 310, no. 5751, 1148 – 1150 (2005).

Cristian Ionescu-Zanetti, Robin M. Shaw, Jeonggi Seo, Yuh-Nung Jan, Lily Y. Jan, and Luke P. Lee, "Mammalian Electrophysiology on a Microfluidic Platform," *Proc. Natl. Acad. Sci. USA*, vol. 102, no. 26, 9112-9117, (2005).

Gang L. Liu, Yu Lu, Jaeyoun Kim, Joy C. Doll, and Luke P. Lee, "Magnetic Nanocrescents as Controllable Surface-Enhanced Raman Scattering Nanoprobes for Biomolecular Imaging," *Advanced Materials*, Vol 17, Issue 22, 2683-2688 (2005).

Gang L. Liu and Luke P. Lee, "Nanowell Surface Enhanced Raman Scattering Arrays Fabricated by Soft-lithography for Label-free Biomolecular Detections in Integrated Microfluidics," *Appl. Phys. Lett.* 87, 074101 (2005).

Philip J. Lee, Paul J. Hung, Robin Shaw, Lily Jan, and Luke P. Lee, "Microfluidic Application Integrated Device for Monitoring Direct Cell-Cell Communication via Gap Junctions Between Individual Cell Pairs," *Appl. Phys. Lett.* 86, 223902 (2005).

Yu Lu, Gang L. Liu, Jaeyoun Kim, Yara X. Mejia, and Luke P. Lee, "Nanophotonic Crescent Moon Structures with Sharp Edge for Ultrasensitive Biomolecular Detections by Local Electromagnetic Field Enhancement Effect," *Nano Letters,* 5(1), 119-124 (2005).

Paul Hung, Philip Lee, and Luke P. Lee, "A Continuous Perfusion Microfluidic Cell Culture Array for High Throughput Cell-based Assays," *Biotechnology & Bioengineering*, 89, 1-8 (2005).

Michelle Khine, Adrian Lau, Cristian Ionescu-Zanetti, Jeonggi Seo, and Luke P. Lee, "A Single Cell Electroporation Chip," *Lab on a Chip*, 5 (1), 38-43 (2005).

Dino Di Carlo, Cristian Ionescu-Zanetti, Yolanda Zhang, Paul Hung and Luke P. Lee, "On-Chip Cell Lysis by Local Hydroxide Generation," *Lab on a Chip* 5 (1) (2005).

Paul J. Hung, Philip J. Lee, Poorya Sabounchi, Nima Aghdam, Robert Lin, and Luke P. Lee, "A Novel High Aspect Ratio Microfluidic Design to Provide a Stable and Uniform Microenvironment for Cell Growth in High Throughput Mammalian Cell Culture Chip Array," *Lab on a Chip*, 5 (1), 44-48 (2005).

M. Yi, K. Jeong, and L. P. Lee, "'Theoretical and Experimental Study towards a Nanogap Dielectric Biosensor," *Biosensor and Bioelectronics*, 20, 1320-1326 (2005).

S. Kwon and L. P. Lee, "Micromachined Transmissive Scanning Confocal Microscope," *Optics Letter*, vol. 29, No. 7, 706-708 (2004).

J. Seo, C. Ionescu-Zanetti, J. Diamond, R. Lal, and L. P. Lee, "Integrated Multiple Patch-clamp Array Chip via Lateral Cell Trapping Junctions," *Appl. Phys. Lett.*, vol. 84, No. 11, 1973-75 (2004).

N. Chronis and L. P. Lee, "Total Internal Reflection-based Biochip Utilizing a Polymer-filled Cavity with a Micromirror Sidewall," *Lab on a Chip*, 4 (2), 125–130 (2004).

K. Jeong, G. L. Liu, N. Chronis, and L. P. Lee, "Tunable Microdoublet Lens Array," *Optics Express,* 12, 2494-2500 (2004).

D. Di Carlo, K. Jeong and L. P. Lee, "Reagentless Mechanical Cell Lysis by Nanoscale Barbs in Microchannels for Sample Preparation," *Lab on a Chip*, vol. 3, 287-291 (2003).

N. Chronis, G. Liu, K. Jeong, and L. P. Lee, "Tunable Liquid-filled Microlens Array Integrated with Microfluidic Network," *Optics Express*, vol. 11, No.19, 2370-2378 (2003).

K. Cheung, K. Djupsund, Y. Dan, and L. P. Lee, "Implantable Multichannel Electrode Array Based on SOI technology," *Journal of Microelectromechanical Systems*, vol. 12 (2), 179 –184 (2003).