

Steve Seung-Young Lee, PhD

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EDUCATION & TRAINING

Hongik University, Seoul, Korea B.S.E., Chemical Engineering	1997-2004
Gwangju Institute of Science and Technology, Gwangju, Korea M.S.E., Materials Science and Engineering Advisor: Giyoong Tae, PhD Thesis: "Photo-crosslinked hydrogel system based on Pluronic F127 for medical applications"	2005-2007
Purdue University, West Lafayette, IN PhD, Biomedical Engineering, Advisor: Ji-Xin Cheng, PhD (Boston University, Biomedical Engineering) Thesis: "Nanomedicines for cancer chemotherapy"	2009-2014
The University of Chicago, Chicago, IL Postdoc, Ludwig Center for Metastasis Research Advisor: Stephen J. Kron, MD-PhD	2014-2018

POSITIONS & APPOINTMENTS

Research Associate Biomedical Research Center, Korea Institute of Science and Technology, Seoul, Korea	2007-2009
Graduate Research Assistant Biomedical Engineering, Purdue University, West Lafayette, IN	2009-2014
Postdoctoral Scholar Molecular Genetics and Cell Biology, University of Chicago, Chicago, IL	2014-2018
Assistant Professor Biopharmaceutical Sciences, University of Illinois at Chicago, Chicago, IL	2018-2019
Assistant Professor Pharmaceutical Sciences, University of Illinois at Chicago, Chicago, IL	2019-Pres.
Full Member University of Illinois Cancer Center, Chicago, IL	2019-Pres.
Faculty Fellow Honors College, University of Illinois at Chicago, Chicago, IL	2019-Pres.

RESEARCH INTERESTS

The Lee laboratory aims to develop novel imaging methods and bioengineering tools for pharmaceutical science research investigating cancer, vascular and inflammatory diseases. To better understand and improve pharmaco-kinetics and dynamics of therapeutic agents, we currently focus on developing:

- 1) 3D multiplex tissue microscopy;
- 2) Integrated microscopy-omics ‘single-cell 3D spatial omics’;
- 3) Antibody modification and engineering for targeted drug delivery;
- 4) Non-parenteral delivery of macromolecular therapeutics

RESEARCH GRANTS/FUNDING

Active

NIH/NIGMS MIRA for ESI (R35) (PI: S.S.-Y. Lee)	09/21-09/26
“Integrated three-dimensional (3D) microscopy for a spatial pharmacology atlas of macromolecular drugs in the tissue microenvironment”	
NIH/NIGMS Diversity supplements (PI: S.S.-Y. Lee)	03/22-03/24
“Diversity Supplement_Integrated three-dimensional (3D) microscopy for a spatial pharmacology atlas of macromolecular drugs in the tissue microenvironment”	
NIH/NIGMS Administrative supplements (PI: S.S.-Y. Lee)	09/22
“Administrative Supplement_Integrated three-dimensional (3D) microscopy for a spatial pharmacology atlas of macromolecular drugs in the tissue microenvironment”	
NIH/NHLBI R01 (PI: G.Y. Park, Co-I: S.S.-Y. Lee)	04/21-03/26
“Mechanism of CX3CR1+ macrophage-mediated resolution of eosinophilic allergic lung inflammation”	
DoD Ovarian Cancer Teal Innovator Award (PI: J.E. Burdette, Co-I: S.S.-Y. Lee)	09/22-08/25
“PAX8 as a Drug Target for High-Grade Serous Cancer”	
NIH/NCI IMAT R33 (PI: A. Karginov, Co-I: S.S.-Y. Lee)	03/22-02/25
“Optogenetic Control of Tumor Initiation and Tumor Progression in vivo”	

Completed

Susan G. Komen for the Cure Postdoctoral Fellowship, PDF15333618 (PI: S.S.-Y. Lee)	08/15-07/18
“Radiation-enhanced immunotherapy for recurrent and metastatic breast cancer”	
NIH Pathway to Independence Award (K99/R00), K99 (PI: S.S.-Y. Lee)	04/17-10/18
“Transparent Tumor Tomography (T3): Multi-parameter 3D imaging for tumor immunotherapy”	
University of Illinois Cancer Center Pilot Program (Multi-PI: S.S.-Y. Lee)	09/20-08/21
“Single-cell spatial proteomics for geographic profiling of protein expression in ovarian tumors”	
NIH/NIBIB Pathway to Independence Award (K99/R00), R00 (PI: S.S.-Y. Lee)	03/19-04/22
“Transparent Tumor Tomography (T3): Multi-parameter 3D imaging for tumor immunotherapy”	

HONORS, FELLOWSHIPS & AWARDS

Honors Scholarship, Hongik University, Seoul, Korea	2002-2004
Korea National Graduate Fellowship, Gwangju Institute of Science and Technology	2005-2007
1 st Place in Research Symposium, Illinois Chapter of Controlled Release Society	08/2011
Outstanding Pharmaceutical Paper Award, Controlled Release Society	07/2014
Susan G. Komen Postdoctoral Fellowship, Susan G. Komen for the Cure	08/2015
*DOD Prostate Cancer Research Program Postdoctoral Fellowship (*relinquished, due to simultaneous awards)	08/2015

Images selected for the 2016 NCI Cancer Close Up, National Cancer Institute	04/2016
Jon Shevell Young Scientist Travel Scholarship, Susan G. Komen for the Cure	05/2016
NIH NIBIB Pathway to Independence Award (K99/R00)	04/2017
SITC Abstract Travel Award, Society for Immunotherapy of Cancer	11/2017
AACR Scholar-in-Training Award, American Association for Cancer Research	04/2018
2019 UKC Best Poster Award, Korean-American Scientists and Engineers Association	08/2019
NIH NIGMS Maximizing Investigators' Research Award (R35)	09/2021

PROFESSIONAL ACTIVITIES

Invited Journal Review: Nat. Biomed. Eng., ACS Nano, Mol. Pharm., J. Control Release, Theranostics, Lab. Invest., J. Transl. Med., Skin Pharmacol. Physiol., Biomaterials, Chem. Eng. J., J. Mater. Chem. B, J. Biomater. Sci. Polym. Ed., and Eur. Polym. J.

Transnostics LLC, Co-founder, President and COO	2016-Pres.
Korean/Korean-American Scientists Association at the University of Chicago, President	2015-2017
UChicago NSF I-Corps Program	2017
NIH Early Career Reviewer, Gene and Drug Delivery (GDD) study section	06/2021
NIH Review Panel, IMST-U70 Human BioMolecular Atlas Program	03/2022

SERVICES

Review Panel of UIC DPI Seed Program Cycle 2	04/2019
Judge for Gary Kruh Research Symposium in UI Cancer Center	04/2019
Judge for Clinic and Research Day in UIC Dentistry	03/2020
Department Seminar, Co-coordinator	2019-2020
Faculty Fellow of UIC Honors College	2019-Pres.
Committee Member of SURF Program in PSCI Department	2020-Pres.
Committee Member of PSCI Graduate Admission	2020-Pres.
Committee Member of PSCI Faculty Search	2020-Pres.
Committee Member of PSCI Department Chair Search	2021
Advisor of PhLAMES Family in UIC College of Pharmacy	2020-Pres.
Advisor of High School Student's Summer Research Program in UI Cancer Center	2022-Pres.

TEACHING

Department Seminar (BPS 595), Co-coordinator	2019-2020
Pharmaceutics I (PHAR 431, PharmD), Instructor	2019-Pres.
Biopharmaceutical Sciences I (BPS 501, Grad), Instructor	2019
Drug Discovery, Design, and Development (PSCI 501, Grad), Instructor	2020-Pres.
Principles of Pharmaceutics and Drug Delivery (PSCI 510, Grad), Instructor and Co-coordinator	2022-Pres.
Cancer and Immuno-Engineering (BME6230, Grad, Cornell University), Instructor	2022-Pres.

RESEARCH TRAINING

Dr. Evan H. Phillips	Postdoctoral scholar	2018-Pres.
Mr. Jingtian Zheng	BPS PhD student	2019-Pres.
Ms. Jessica Mo	PharmD student	2019
Ms. Yi-Chien Wu	PSCI PhD student	2020-Pres.
Ms. Samantha Emery	PSCI PhD student	2020-Pres.
Dr. Xu Wang	Postdoctoral scholar	2020-2022
Ms. Dahee Jung	PSCI PhD student	2021-Pres.
Mr. Chirstopher Korfiatis	PharmD student	2022-Pres.
Ms. Kennedy Bray	High school student	2022
Ms. Margaret Afolabi	PharmD student	2022-Pres.
Mr. Jimmy Bui	Undergraduate student	2022-Pres.

GRADUATE STUDENT EXAM COMMITTEES

Mr. Karol Sokolowski, Mr. Ziwei Zhang, Mr. Tim Langridge	2019-2020
Ms. Giokdjen Ilktach, Mr. Xinhao Shao, Ms. Catherine Dial, Ms. Raghd Nowar	2020-2021
Mr. Jingtian Zheng, Ms. Yi-Chien Wu, Ms. Samantha Emery, Mr. Ziwei Zhang, Mr. Karol Sokolowski, Mr. Tim Langridge	2021-2022
Mr. Xiao Guo, Mr. Karol Sokolowski	2022-Pres.

RESEARCH PAPERS (* indicates co-first author and senior author is underlined)

1. Chung, Y.-I.; Lee, S.-Y.; Tae, G., “The effect of heparin on the gellation of Pluronic F-127 hydrogel”, *Colloids Surf. A* 2006; 284; 480.
2. Chung, Y.-I.; Ahn, K.-M.; Jeon, S.-H.; Lee, S.-Y.; Lee, J.-H.; Tae, G., “Enhanced bone regeneration with BMP-2 loaded functional nanoparticle-hydrogel complex”, *J. Controlled Release* 2007; 121; 91.
3. Lee, S.-Y.; Tae, G.; Kim, Y.-H., “Thermal gellation and photo-polymerization of di-acrylated Pluronic F 127”, *J. Biomater. Sci. Polym. Ed.* 2007; 18; 1335.
4. Lee, S.-Y.; Tae, G., “Formulation and in vitro characterization of an *in situ* gelable, photo-polymerizable Pluronic hydrogel suitable for injection”, *J. Controlled Release* 2007; 119; 313.
5. Lee, S.; Cha, E.-J.; Park, K.; Lee, S.-Y.; Hong, J.-K.; Sun, I.-C.; Kim, S. Y.; Choi, K.; Kwon, I. C.; Kim, K.; Ahn, C.-H., “A near-infrared-fluorescence-quenched gold-nanoparticle imaging probe for *in vivo* drug screening and protease activity determination”, *Angew. Chem. Int. Ed.* 2008; 47; 2804
6. Lee, S.; Park, K.; Lee, S.-Y.; Ryu, J. H.; Park, J. W.; Ahn, H. J.; Kwon, I. C.; Youn, I.-C.; Kim, K.; Choi, K., “Dark quenched matrix metalloproteinase fluorogenic probe for imaging osteoarthritis development *in vivo*”, *Bioconjugate Chem.* 2008; 19; 1743 (cover).
7. Nam, H. Y.; Kwon, S. M.; Chung, H.; Lee, S.-Y.; Jeon, H.; Kwon, S.-H.; Her, S.; Park, J. H.; Kim, J.; Oh, Y.-K.; Kim, K.; Kwon, I. C.; Kim, K.; Jeong, S. Y., “Cellular uptake mechanism and intracellular fate of hydrophobically modified glycol chitosan nanoparticles”, *J. Controlled Release* 2009; 135; 259.
8. Lee, S.-Y.; Tae, G.; Kim, Y.-H., “Accelerated micellization and aggregation of Pluronic micelles by the interaction with heparin”, *J. Biomater. Sci. Polym. Ed.* 2010; 21; 727.
9. Lee, S.-Y.; Lee, S.; Youn, I.-C.; Yi, D. K.; Lim, Y. T.; Chung, B. H.; Leary, J. F.; Kwon, I. C.; Kim, K.; Choi, K., “A near-infrared fluorescence-based optical thermosensor”, *Chem. Eur. J.* 2009; 15; 6103.

10. **Lee, S.-Y.**; Huh, M. S.; Lee, S. J.; Chung, H.; Park, J. H.; Oh, Y.-K.; Choi, K.; Kim, K.; Kwon, I. C., “Stability and cellular uptake of polymerized siRNA (poly-siRNA)/polyethylenimine (PEI) complexes for efficient gene silencing”, *J. Controlled Release* 2010; 141; 339.
11. Lee, S.; Ryu, J. H.; Park, K.; Lee, A.; **Lee, S.-Y.**; Youn, I.-C.; Ahn, C.-H.; Yoon, S. M.; Myung, S.-J.; Moon, D. H.; Chen, X.; Choi, K.; Kwon, I. C.; Kim, K., “Polymeric nanoparticle-based activatable near-infrared nanosensor for protease determination *in vivo*”, *Nano Lett.* 2009; 9; 4412.
12. Chung, Y.-I.; Kim, J. C.; Kim, Y. H.; Tae, G.; **Lee, S.-Y.**; Kim, K.; Kwon, I. C., “The effect of surface functionalization of PLGA nanoparticles by heparin- or chitosan-conjugated Pluronic on tumor targeting”, *J. Controlled Release* 2010; 143; 374.
13. Huh, M. S.*; **Lee, S.-Y.***; Park, S.; Lee, S.; Chung, H.; Lee, S.; Choi, Y.; Oh, Y.-K.; Park, J. H.; Jeong, S. Y.; Choi, K.; Kim, K.; Kwon, I. C., “Tumor-homing glycol chitosan/polyethylenimine nanoparticles for the systemic delivery of siRNA in tumor-bearing mice”, *J. Controlled Release* 2010; 144; 134.
14. Nam, T.; Park, S.; **Lee, S.-Y.**; Park, K.; Choi, K.; Song, I. C.; Han, M. H.; Leary, J. J.; Yuk, S. A.; Kwon, I. C.; Kim, K.; Jeong, S. Y., “Tumor targeting chitosan nanoparticles for dual-modality optical/MR cancer imaging”, *Bioconjugate Chem.* 2010; 21; 578.
15. Kim, J.Y.; Choi, W.I.; Kim, Y.-H.; Tae, G.; **Lee, S.-Y.**; Kim, K.; Kwon, I.C., “*In-vivo* tumor targeting of Pluronic-based nano-carriers”, *J. Controlled Release* 2010; 147; 109.
16. Lee, S.; **Lee, S.-Y.**; Park, S.; Rye, J.H.; Na, J.H.; Koo, H.; Lee, K.E.; Jeon, H.; Kwon, I.C.; Kim, K.; Jeong, S.Y., “*In vivo* NIRF imaging of tumor targetability of nanosized liposomes in tumor-bearing mice”, *Macromol. Biosci.* 2012; 12; 849.
17. Lee, S.J.; Huh, M.S.; **Lee, S.-Y.**; Min, S.; Lee, S.; Koo, H.; Jeon, H.; Choi, Y.; Choi, K.; Byun, Y.; Jeong, S.Y.; Park, K.; Kim, K.; Kwon, I.C., “Tumor-homing poly-siRNA/glycol chitosan self-cross-linked nanoparticles for systemic siRNA delivery in cancer treatment”, *Angew. Chem. Int. Ed.* 2012; 51; 7203.
18. Na, J.H.*; **Lee, S.-Y.***; Lee, S.; Koo, H.; Min, K.H.; Jeong, S.Y.; Yuk, S.H.; Kim, K.; Kwon, I.C., “Effect of the stability and deformability of self-assembled glycol chitosan nanoparticles on tumor-targeting efficiency”, *J. Controlled Release* 2012; 163; 2.
19. **Lee, S.-Y.**; Kim, S.; Jacqueline, J.T.; Park, K.; Cheng, J.-X., “Blood-stable, tumor-adaptable disulfide bonded mPEG-(Cys)(4)-PDLLA micelles for chemotherapy”, *Biomaterials* 2013; 34; 552.
20. **Lee, S.-Y.**; Jacqueline, J.T.; Kim, S.; Park, K.; Cheng, J.-X., “FRET imaging reveals different entry routes of self-assembled and disulfide bonded polymeric micelles”, *Mol. Pharm.* 2013; 10; 3497.
21. Wu, W.*; **Lee, S.-Y.***; Wu, X.; Tyler, Y.J.; Wang, H.; Ouyang, Z.; Park, K.; Xu, X.-M.; Cheng, J.-X., “Neuroprotective ferulic acid (FA)-glycol chitosan (GC) nanoparticles for functional restoration of traumatically injured spinal cord”, *Biomaterials* 2014; 35; 2355.
22. Yue, S.; Li, J.; **Lee, S.-Y.**; Lee, H.J.; Shao, T.; Song, B.; Masterson, T.A.; Liu, X.; Ratliff, T.L.; Cheng, J.-X., “Cholesteryl ester accumulation induced by PTEN loss and PI3K/AKT activation underlies human prostate cancer aggressiveness”, *Cell Metab.* 2014; 19; 393.
23. Ping, X.; Jiang, K.; **Lee, S.-Y.**; Cheng, J.-X.; Jin, X., “PEG-PDLLA micelles improve the function of myelinated axons following traumatic brain injury”, *J. Neurotrauma* 2014; 31; 1172.
24. Liao, C.-S.; Slipchenko, M.N.; Wang, P.; Li, J.; **Lee, S.-Y.**; Oglesbee, R.A.; Cheng, J.-X., “Microsecond time-scale vibrational spectral imaging by parallel detection of stimulated Raman

scattering”, *Light: Science & Applications* 2015; 4; e265.

25. Lee, S. S.-Y.*; Li, J.*; Tai, J. N.; Ratliff, T.L.; Park, K.; Cheng, J.-X., “Avasimibe encapsulated in human serum albumin blocks cholesterol esterification for selective cancer treatment”, *ACS Nano* 2015; 9; 2420.
26. Li, J.; Gu, D.; Lee, S. S.-Y.; Song, B.; Bandyopadhyay, S.; Chen, S.; Konieczny, S.F.; Ratliff, T.L.; Xie, J.; Cheng, J.-X., “Abrogating cholesterol esterification suppresses growth and metastasis of pancreatic cancer”, *Oncogene* 2016; 35; 6378.
27. Lee, S. S.-Y.; Bindokas, V.; Kron, S.J., “Multiplex three-dimensional optical mapping of tumor immune microenvironment”, *Scientific Reports* 2017; 7; 17031.
28. Fowler, J.L.; Lee, S. S.-Y.; Wesner, Z.C.; Olehnik, S.K.; Kron, S.J.; Hara, M., “Three-dimensional analysis of the human pancreas”, *Endocrinology* 2018; 159; 1393.
29. Lee, S. S.-Y.; Bindokas, V.; Kron, S.J., “Multiplex three-dimensional mapping of macromolecular drug distribution in the tumor microenvironment”, *Molecular Cancer Therapeutics* 2018; 18; 213.
30. Lee, S. S.-Y.; Bindokas, V.; Lingen, M.; Kron, S.J., “Non-destructive, multiplex three-dimensional mapping of immune infiltrates in core needle biopsy”, *Laboratory Investigation* 2018; 99; 1400.
31. Xu, J.; Lee, S. S.-Y.; Seo, H.; Pang, L.; Jun, Y.; Zhang, R.-Y.; Zhang, Z.-Y.; Kim, P.; Lee, W.; Kron, S.J.; Yeo, Y., “Quinic Acid-Conjugated Nanoparticles Enhance Drug Delivery to Solid Tumors via Interactions with Endothelial Selectins”, *Small* 2018; 14; e1803601.
32. Karginova, O.; Weekley, C.M.; Raoul, A.; Alsayed, A.; Wu, T.; Lee, S. S.-Y.; He, C.; Olopade, I.O., “Inhibition of copper transport induces apoptosis in triple negative breast cancer cells and suppresses tumor angiogenesis”, *Molecular Cancer Therapeutics* 2019; 18; 873.
33. Ishihara, J.; Ishihara, A.; Sasaki, K.; Lee, S. S.-Y.; Yasui, M.; Abe, H.; Potin, L.; Hosseinchi, P.; Fukunaga, K.; Raczky M.M.; Gray, L.T.; Williford, J.-M.; Fukayama, M.; Kron, S.J.; Swartz, M.A.; Hubbell, J.A., “Targeted antibody and cytokine cancer immunotherapies through collagen affinity”, *Science Translational Medicine* 2019; 11(487); pii: eaau3259.
34. Efimova, E.V.; Appelbe, O.K.; Ricco, N.; Lee, S. S.-Y.; Liu, Y.; Wolfgeher D.J.; Collins, T.; Flor, A.C.; Ramamurthy, A.; Warrington S.; Bindokas, V.P.; Kron, S.J., “O-GlcNAcylation enhances double strand break repair, promotes cancer cell proliferation and prevents therapy-induced senescence in irradiated tumors”, *Molecular Cancer Research* 2019; 17; 1338.
35. Qiao, G.; Kone, L.; Phillips, E.H.; Lee, S. S.-Y.; Brown, G.; Khetani, S.; Thakur, A.; Lum, L.G.; Prabhakar, B.S.; Maker, A.V., “LIGHT enhanced bispecific antibody armed T-cells to treat immunotherapy resistant colon cancer”, *Oncogene* 2022; 41; 2054.

Manuscripts under review or in preparation (Senior author is underlined)

1. Wang, X.; Emery, S.C.; Iyer, M.A.; Szmeler, A.H.; Eddington, D.T.; Lee, S. S.-Y., “Spatially selective cell treatment and collection for integrative drug testing using hydrodynamic flow focusing and shifting”, in revision.
2. Phillips, E.H.; Bindokas, V.P.; Kitajewski, J.; Solaro, R.J.; Wolska, B.M.; Lee, S. S.-Y., “Methodology for 3D spatial quantitative analysis of cardiac lymphatics in the mouse heart”, in revision.
3. Wu, Y.; Moon, H.-G.; Bindokas, V.P., Park, G.Y.; Lee, S. S.-Y., “Multi-resolution 3D microscopy of asthma mouse lung”, submitted.
4. Moon, H.-G.; Kim, S.-J.; Jacobsen, E.A.; Kim, Y.-M.; Rehman, J.; Lee, H.; Wu, Y.-C.; Lee, S. S.-

Y.; Christman, J.W.; Ackerman, S.J.; Kim, M.; You, S.; Park, G.Y., “CCL26 facilitates the resolution of allergic lung inflammation via CX3CR1+ macrophage-mediated eosinophil clearance”, submitted.

5. Zheng, J.; Phillips, E.H.; Wu, Y.-C.; Emery, S.; Lee, S. S.-Y., “Highly multiplexed 3D optical mapping of the tumor microenvironment”, in preparation.
6. Lee, S. S.-Y.; Pagacz, J.; Scholten, D.; Liu, Y.; Kron, S.J., “Post-radiation anti-tumor immune response is enhanced by timed administration of PD-L1 immune checkpoint blockade antibody”, in preparation.
7. Kim, Y.-M.; Mancinelli, G.; Grippo, P.; Emery, S.; Krantz, S.; Lee, S. S.-Y.; Rehman, J., “Downregulation of PGC1- α in the Skeletal Muscle Endothelium Mediates Cancer Cachexia by Compromising Vascular Barrier Integrity”, in preparation.

BOOK CHAPTER (Senior author is underlined)

1. Lee, S.-Y., Cheng, J.-X., “Nanoparticulate drug delivery: clearance of nanoparticles during circulation” John Wiley & Sons, Inc. (2013), ISBN: 978-1-118-57051-7, pp209-239.
2. Phillips, E. H.; Scholten, D.; Kron, S. J.; Lee, S. S.-Y., “Multiplexed tissue tomography” Springer Science Business Media, LLC, (2021), ISBN: 978-1-0716-1592-8, pp77-93.
3. Wu, Y.-C.; Pagacz, J.; Emery, S.C.; Kron, S.J.; Lee, S. S.-Y., “Spatial mapping of the tumor immune microenvironment” Academic Press, (2021), ISBN: 978-0-323-90949-5, pp293-329.

PATENTS (Senior author is underlined)

1. Tae, G.; Lee, S.-Y., “Injectable photo-crosslinked hydrogels, biodegradable implant and drug delivery system using the same, and the preparation method thereof”, KR 10-20070776297B1.
2. Kim, K.; Kwon, I. C.; Choi, K.; Huh, M. S.; Lee, S.-Y.; Lee, S. J., “Polymeric nano-particles for siRNA delivery using charge interaction and covalent bonding” KR2010-0089081, US 2012/0065242.
3. Lee, S.-Y.; Kwon, I. C.; Kim, K.; Choi, K.; Lee, S., “SiRNA delivery system using self-assembled polymeric nanoparticles” WO2010/131907, PCT/KR2010/003013.
4. Kim, K.; Kwon, I. C.; Choi, K.; Lee, S.-Y.; Youn, I.; Huh, M. S.; Lee, S. J., “Method for polymerizing a small oligonucleotide, and use of a high-molecular oligonucleotide prepared by the polymerization method”, KR10-2010-0123195A, CN102361882A, US2011/0274930A1, WO2010/131835A2, EP2431378A2.
5. Cheng, J.-X.; Lee, S.-Y., “Cholesteryl ester-depleting nanomedicine for non-toxic cancer chemotherapy”, US20160199497 A1.

ORAL PRESENTATIONS (In International and National Conferences)

1. Lee, S.-Y.; Tae, G., “New method of injectable hydrogels by novel photo-polymerization”, Polymer Society of Korea Annual Fall Scientific Meeting, 10-13 Oct. (2006), Busan, Korea.
2. Lee, S.-Y., “Nanomedicine-based synergistic therapy for early repair of traumatically injured spinal cord”, BMEGSA Summer Seminar, 19 July (2011), West Lafayette, IN.
3. Lee, S.-Y.; Kim, S.; Park, K.; Cheng, J.-X., “FRET-based subcellular visualization of S-S bond cleavage in micellar drug delivery by glutathione”, BMEGSA Research Symposium, 28 July

(2011), West Lafayette, IN.

4. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Transparent tumor tomography (T3): Multi-parameter 3D tumor imaging”, KSAUC seminar, 23 Oct. (2015), Chicago, IL.
5. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Transparent tumor tomography (T3): A tissue clearing-based 3D tumor imaging method”, CBC workshop, 4 Feb. (2016), Chicago, IL.
6. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “3D tumor immunofluorescence imaging method for tumor immunology and immunotherapy”, UCCC Metastasis Working Group Meeting, 14 Feb. (2017), Chicago, IL.
7. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Multiplex 3D optical mapping of tumor immune microenvironment”, 32nd SITC Annual Meeting, 9-12 Nov. (2017), Maryland, MD.
8. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Multiplex three-dimensional imaging cytometry for mapping tumor immune microenvironment”, AACR-KCA Joint Conference, 15-17 Nov. (2018), Seoul, Korea.

INVITED SEMINAR TALKS

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| 1. | UIC Center of Bimolecular Sciences | 11/2019 |
| 2. | UIC BPS Departmental Seminar | 01/2019 |
| 3. | Translational Oncology Seminar, UI Cancer Center | 02/2019 |
| 4. | Translational Oncology Program Retreat, UI Cancer Center | 06/2019 |
| 5. | UIC College of Pharmacy Colloquium Seminar Series (BPS 425) at Rockford | 09/2019 |
| 6. | UIC Prostate Cancer Research Group | 11/2019 |
| 7. | UIC Tumor Microenvironment Group | 03/2020 |
| 8. | UIC E+W Mixer | 01/2021 |
| 9. | Cancer Biology Program, UI Cancer Center | 04/2021 |
| 10. | Cancer Biology Program Retreat, UI Cancer Center | 07/2021 |
| 11. | Medical Scientist Training Program, UIC Medicine | 09/2021 |
| 12. | Cancer Center Seminar, Purdue University | 11/2021 |
| 13. | Department of Biochemistry and Molecular Medicine, George Washington University | 12/2021 |
| 14. | Department of Pathology, UIC Medicine | 09/2022 |

POSTER PRESENTATIONS

1. **Lee, S.-Y.**; Tae, G., “Novel photo-polymerization method to make injectable hydrogels”, The 5th Asian International Symposium on Biomaterials, 15-28 Nov, (2006), Xiamen, China.
2. **Lee, S.-Y.**; Kim, S.; Park, K.; Cheng, J.-X., “A reversibly crosslinked micelle for intravenous delivery of paclitaxel”, 38th Annual meeting of the Controlled Release Society, 30-3 July-Aug, (2011), National Harbor, MD.
3. **Lee, S.-Y.**; Kim, S.; Park, K.; Cheng, J.-X., “FRET-based subcellular visualization of S-S bond cleavage in micellar drug delivery by glutathione”, The 3rd Controlled Release Society Illinois Student Chapter Symposium, 12 Aug, (2011), Chicago, IL.

4. **Lee, S.-Y.**; Kim, S.; Park, K.; Cheng, J.-X., “Prevention of pre-mature drug release from polymer micelles through a disulfide bond shell”, Sigma XI Graduate student research competition, 15 Feb, (2012), West Lafayette, IN.
5. **Lee, S.-Y.**; Kim, S.; Park, K.; Cheng, J.-X., “FRET-based subcellular visualization of S-S bond cleavage in micellar drug delivery by glutathione”, 3rd Annual Workshop for Spectroscopic Imaging, 23-24 May, (2013), West Lafayette, IN.
6. **Lee, S.-Y.**; Li, J.; Tai, J. N.; Ratliff, T.L.; Park, K.; Cheng, J.-X., “Cholesteryl ester-depleting nanomedicine for cancer selective chemotherapy”, The Indiana University Cancer Center’s Cancer Research Day, 29 May (2014), Indianapolis, IN.
7. **Lee, S.-Y.**; Li, J.; Tai, J. N.; Ratliff, T.L.; Park, K.; Cheng, J.-X., “Cholesterol esterification-blocking nanoparticles for targeted aggressive cancer therapy”, 41st Annual meeting of the Controlled Release Society, 13-16 July, (2014), Chicago, IL.
8. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Transparent tumor tomography (T3): Spatial 3D mapping of immune responses in a whole tumor after immunotherapy”, CRI-CIMT-EATI-AACR 1st Cancer Immunotherapy Conference, 16-19 Sept. (2015), Manhattan, NY.
9. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Transparent tumor tomography (T3): Spatial analysis for PD-L1 checkpoint blockade immunotherapy”, CRI-CIMT-EATI-AACR 2nd Cancer Immunotherapy Conference, 25-28 Sept. (2016), Manhattan, NY.
10. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., “Transparent tumor tomography (T3): 3D spatial immunoanalysis for PD-L1 immune checkpoint blockade therapy”, 2017 AACR Annual Meeting, 1-5 April (2017), Washington, DC.
11. **Lee, S. S.-Y.**, Bindokas, V.; Kron, S.J., “Multiplex three-dimensional optical mapping of tumor immune microenvironment”, 2017 CRI-CIMT-EATI-AACR 3rd Cancer Immunotherapy Conference, 6-9 Sept. (2017), Mainz, Germany.
12. **Lee, S. S.-Y.**, Bindokas, V.; Kron, S.J., “Multiplex three-dimensional optical mapping of tumor immune microenvironment”, An AACR Special Conference on Tumor Immunology and Immunotherapy, 1-4 Oct. (2017), Boston, MA.
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