# Steve Seung-Young Lee, PhD

Department of Pharmaceutical Sciences
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## EDUCATION & TRAINING

Hongik University, Seoul, Korea 1997-2004
B.S.E., Chemical Engineering

Gwangju Institute of Science and Technology, Gwangju, Korea 2005-2007
M.S.E., Materials Science and Engineering
Advisor: Giyoong Tae, PhD
Thesis: "Photo-crosslinked hydrogel system based on Pluronic F127 for medical applications"

Purdue University, West Lafayette, IN 2009-2014
PhD, Biomedical Engineering,
Advisor: Ji-Xin Cheng, PhD (Boston University, Biomedical Engineering)
Thesis: "Nanomedicines for cancer chemotherapy"

The University of Chicago, Chicago, IL 2014-2018
Postdoc, Ludwig Center for Metastasis Research
Advisor: Stephen J. Kron, MD-PhD

## POSITIONS & APPOINTMENTS

Research Associate 2007-2009
Biomedical Research Center, Korea Institute of Science and Technology, Seoul, Korea

Graduate Research Assistant 2009-2014
Biomedical Engineering, Purdue University, West Lafayette, IN

Postdoctoral Scholar 2014-2018
Molecular Genetics and Cell Biology, University of Chicago, Chicago, IL

Assistant Professor 2018-2019
Biopharmaceutical Sciences, University of Illinois at Chicago, Chicago, IL

Assistant Professor 2019-Pres.
Pharmaceutical Sciences, University of Illinois at Chicago, Chicago, IL

Full Member 2019-Pres.
University of Illinois Cancer Center, Chicago, IL

Faculty Fellow 2019-Pres.
Honors College, University of Illinois at Chicago, Chicago, IL

## 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 '3D spatial omics';

3) Antibody modification and engineering for targeted drug and vaccine 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/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"

UI Cancer Center Pilot Study Grant (Multi-PIs: S. Jun, S.S.-Y. Lee, K. Hoskins) 05/23-04/24
"Microbiome-tumor-axis and multi-omics to identify molecular mechanisms of breast cancer disparities

NIH/NHLBI R21 (PI: Z. Zhao, Co-I: S.S-Y. Lee) 07/23-06/25
"Combinatorial cytokine-coated macrophages for targeted immunomodulation in acute lung injury"

NIH/NCI R37 (PI: S. Sant, Co-I: S.S.-Y. Lee) 07/23-06/25
"Three-dimensional organoid models to study breast cancer progression"

NIH/NIDDK R01 (PI: J. Sun, Co-I: S.S.-Y. Lee) 04/24-04/29
"How vitamin D receptor influences intestinal barriers"

**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"

NIH/NIGMS Diversity supplements (PI: S.S.-Y. Lee) 03/22-08/23
"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"

## HONORS, FELLOWSHIPS & AWARDS

Honors Scholarship, Hongik University, Seoul, Korea 2002-2004

Korea National Graduate Fellowship, Gwangju Institute of Science and Technology 2005-2007

1st 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., Nat. Comm. Bio, J. Cell & Molecular Medicine, JoVE.

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

NIH/CSR ZRG1 MBBC-D (55) study section panel for the NIGMS MIRA R35 ESI 03/2023

## 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 2020-2022

Committee Member of PSCI Department Chair Search 2021

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|---|---|
| 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. |
| Committee Member of Graduate College Award | 2022-2023 |
| Member of the Educational Policy Committee in the UIC College of Pharmacy | 2023-Pres. |

**TEACHING**

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|---|---|
| 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. |
| Caner and Immuno-Engineering (BME6230, Grad, Cornell University), Instructor | 2022-Pres. |
| Foundations of Cancer Biology (GEMS 551, Grad, Medical Science), Instructor | 2022 |

**RESEARCH TRAINING**

| | | |
|---|---|---|
| Dr. Evan H. Phillips | Postdoctoral scholar | 2018-2023 |
| 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 | 2022-2023 |
| Ms. Kennedy Bray | High school student | 2022 |
| Ms. Margaret Afolabi | PharmD student | 2022-Pres. |
| Mr. Jimmy Bui | Undergraduate student | 2022-2023 |
| Mr. Elie Abi Khalil | PSCI PhD student | 2023-Pres. |
| Ms. Francine Chuy | PharmD student | 2023 |
| Ms. Laila Atieh | BSPS student | 2023 |
| Mr. Ruthwik Bhadrachalam | High school student | 2023 |
| Ms. Xiaoying Cai | PSCI PhD student | 2023-Pres. |
| Ms. Zuhur Almalki | PSCI PhD student | 2023 |
| Ms. Luyu Zhang | PSCI PhD student | 2023 |
| Mr. Abel Woldesenbete | PSCI PhD student | 2023 |

**GRADUATE STUDENT EXAM COMMITTEEES**

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|---|---|
| Mr. Karol Sokolowski, Mr. Ziwei Zhang, Mr. Tim Langridge | 2019 |
| Ms. Giokdjen Ilktach, Mr. Xinhao Shao, Ms. Catherine Dial, Ms. Raghd Nowar | 2020 |
| Mr. Jingtian Zheng, Ms. Yi-Chien Wu, Ms. Samantha Emery, Mr. Ziwei Zhang, Mr. Karol Sokolowski, Mr. Tim Langridge | 2021 |
| Mr. Xiao Guo, Mr. Karol Sokolowski, Ms. Catherine Dial | 2022 |
| Ms. Raghd Nowar, Mr. Ziwei Zhang, Ms. Chih-Jia Chao, Ms. Hanan Algarni, Ms. Philana Phan, Mr. Jingtian Zheng, Ms. Yi-Chien Wu, Ms. Shruthi Selvaraji, Ms. Monica Chen | 2023 |
| Ms. Sonia Alavi, Ms. Edidiong Udofa, Mr. Jay Teamer, Mr. Ziwei Zhang, Mr. Jingtian Zheng, Mr. Elie Abi | |

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

***Publications during M.S., Ph.D., and Postdoctoral training periods***

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.; Kown, 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 Pluornic 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.; Raczy 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.

***Publications after joining UIC as an assistant professor***

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.

36. 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", *PLOS ONE* 2023; 18; e0279102.

37. Moon, H.-G.; Kim, S.-J.; 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., "$CX_3CR_1$+ macrophage facilitates the resolution of allergic lung inflammation via interacting CCL26", *American Journal of Respiratory and Critical Care Medicine* 2023; doi: 10.1164/rccm.202209-1670OC.

38. Wu, Y.; Moon, H.-G.; Bindokas, V.P., Park, G.Y.; **Lee, S. S.-Y.**, "Multi-resolution 3D microscopy of asthma mouse lung", *American Journal of Pespiratory Cell and Molecular Biology* (Cover) 2023, 69 (1), 13; doi: 10.1165/rcmb.2022-0353MA

39. Phillips, E.H.; Bindokas, V.P.; Jung, D.; Teamer, J.; Kitajewski, J.; Solaro, R.J.; Wolska, B.M.; **Lee, S. S.-Y.**, "Three-dimensional spatial quantitative analysis of cardiac lymphatics in the mouse heart", *Microcirculation* 2023, e12826; doi: 10.1111/micc.12826.

40. Zheng, J.; Wu, Y.; Phillips, E.H.; Wang, X.; Cai, X.; **Lee, S. S.-Y.**, "Increased multiplexity in optical tissue clearing-based 3D immunofluorescence microscopy of the tumor microenvironment by LED photobleaching", *Accepted, Laboratory Investigation* 2023; https://authors.elsevier.com/sd/article/S0023-6837(24)01750-1

41. Kim, Y.-M.; Sanborn, M.A.; Wang, X.; Mancinelli, G.; Chakraborty, S.; Vijeth, S.; Gajwani, P.; Grippo, P.; **Lee, S. S.-Y.**; Valyi-Nagy, T.; Toth, P.T.; Valyi-Nagy, K.; Rehman, J., "Impaired Barrier Integrity of the Skeletal Muscle Vascular Endothelium Drives Progression of Cancer Cachexia", *bioRxiv* 2023; doi: https://doi.org/10.1101/2022.12.12.520118 (In revision for resubmission to *Nature*).

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

1. Zheng, J.; Wu, Y.; Cai, X.; Er, E.E.; Zhao, Z.; **Lee, S. S.-Y.**, "Correlative 3D multi-scale imaging of mouse tumor and brain by sequential light sheet and confocal fluorescence microscopy", in

preparation.

2. Chao, C.; Zhang, E.; Trinh, D.; Udofa, E.; He, S.; Zheng, J.; Bao, Q.; Phan, P.; Elgendy, S.; Shi, X.; Burdette, J.; **Lee, S. S.-Y.**; Yu, G.; Zhao, Z., "Antigen capturing nanoparticle boosted cDC1 therapy for in situ cancer immunization", under review.

**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.
9. **Lee, S.S.-Y.,** "3D multiplex fluorescence microscopy for the tumor microenvironment", 2022 Midwest Tumor Microenvironment Meeting, 23-25 May (2022), Kansas City, KS.

## 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 |
| 15. | Department of Pharmaceutical Sciences, University of Kentucky | 11/2022 |
| 16. | Department of Chemistry, Southern Methodist University | 10/2023 |
| 17. | UIC College of Pharmacy Colloquium Seminar Series (BPS 425) at Chicago | 11/2023 |

## 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.

13. **Lee, S. S.-Y.**; Bindokas, V.; Kron, S.J., "Quantitative three-dimensional cytometry of tumor microenvironment", 2018 AACR Annual Meeting, 13-18 April (2018), Chicago, IL.

14. **Lee, S. S.-Y.**; Scholten, D.G.; Bindokas, V.; Kron, S.J., "Multiplex three-dimensional mapping of mRNA and protein in the tumor microenvironment", 2018 CRI-CIMT-EATI-AACR 4th Cancer Immunotherapy Conference, 30 Sept.-3 Oct. (2018), Manhattan, NY.

15. **Lee, S. S.-Y.**; Scholten, D.G.; Bindokas, V.; Kron, S.J., "Multiplexed Three-Dimensional Imaging Cytometry for Mapping Tumor Immune", 2019 KSEA UKC, 15-17 Aug. (2019), Chicago, IL.

16. Phillips, E.; Mo, J.; Gill, M.; Guo, X.; Wang, Z.; Kron, S.; **Lee. S. S.-Y.**, "Multiplex 3D microscopy for analysis of the tissue microenvironment", 2020 Chicago Neurovascular Meeting, 13 Feb. (2020), Chicago, IL.

17. Phillips, E.; Mo, J.; Gill, M.; Guo, X.; Wang, Z.; Kron, S.; **Lee. S. S.-Y.**, "Multiplex three-dimensional microscopy of vasculature in the tissue microenvironment", 2020 Gordon Research Symposium and Conference (Lymphatics), 1-6 March (2020), Ventura, CA.

18. Mo, J.; Lyer, M.; Eddington, D.; **Lee, S. S.-Y.**, "Development of Electrophoresis-Assisted Immunofluorescence Staining of Macrosectioned Tumor Tissue", 2020 Research Day of UIC College of Pharmacy, 6 Nov. (2020), Chicago, IL.

19. Wu, Y.-C.; Hoskins, K.; **Lee, S. S.-Y.**, "Multiplex Three-Dimensional (3D) Microscopy for the Breast Tumor Microenvironment", 2020 Susan G Komen Metastatic Breast Cancer Conference, 21-22 Aug. (2020), Chicago, IL.

20. Phillips, E.; Bindokas, V.; Solaro, R.J.; Wolska, B.; Kitajewski, J.; **Lee, S. S.-Y.**, "3D Spatial Quantitative Analysis of the Cardiac Lymphatics in a Mouse Model of Hypertrophic Cardiomyopathy", UIC College of Pharmacy Research Day, 12 Nov (2021), Chicago, IL
21. Wu, Y.-C.; **Lee, S. S.-Y.**, "Single-cell 3D spatial omics for tumor hypoxia", UIC College of Pharmacy Research Day, 12 Nov (2021), Chicago, IL
22. Jung, D.; **Lee, S. S.-Y.**, "Toward understanding IgG transcytosis", UIC College of Pharmacy Research Day, 12 Nov (2021), Chicago, IL
23. Wang, X.; Emery, S.C.; Lyer, M.A.; Szmelter, A.H.; Eddington, D.T; **Lee, S. S.-Y.**, "A spatially controlled in vitro cell study system using hydrodynamic focusing", UIC College of Pharmacy Research Day, 12 Nov (2021), Chicago, IL
24. Emery, S.C.; **Lee, S. S.-Y.**, "Single-Cell 3D Spatial Transcriptomics for the Deconvolution of Tumor-Associated Vasculature", UIC College of Pharmacy Research Day, 12 Nov (2021), Chicago, IL
25. Zheng, J.; **Lee, S. S.-Y.**, "Development of anti-immune checkpoint Fab fragment for improving cancer immunotherapy", UIC College of Pharmacy Research Day, 12 Nov (2021), Chicago, IL
26. Wu, Y.-C.; **Lee, S.S.-Y.**, "Single-cell 3D spatial omics for tumor hypoxia", 2022 Annual AACR conference, 15 June (2022), Philadelphia, PA
27. Zheng, J.; Phillips, E., Wu, Y.-C., Bindokas, V.; **Lee, S. S.-Y.**, "LED photobleaching-based multiplex 3D microscopy of the tumor microenvironment", 2023 Annual AACR conference, 19 April (2023), Orlando, FL
28. **Lee, S. S.-Y.**; Wu, Y.-C.; Zheng, J.; Khalil, E.A.; Wang, S.; Plank, J.; Lippert, A., "3D Correlative Multi-Scale Cellular and Molecular Architectures of Solid Tumors and Other Tissues", 2024 Annual AACR conference, 8 April (2024), San Diego, CA