Stanford

# Jonathan T.C. Liu

Professor of Pathology and Professor, by courtesy, of Bioengineering

NIH Biosketch available Online

## Bio

### BIO

Dr. Jonathan Liu is a biomedical engineer and professor in the department of pathology, where his laboratory develops high-resolution optical-imaging devices and computational-analysis strategies for guiding treatment decisions. In particular, Dr. Liu's lab is developing non-destructive slide-free 3D pathology methods for clinical decision support and surgical guidance. In comparison to conventional slide-based pathology, 3D pathology provides: (1) vastly greater sampling of tissue specimens including whole biopsies and surgical margins, (2) volumetric imaging of cell distributions and 3D tissue structures that are prognostic and predictive, and (3) a non-destructive and reversible workflow that preserves valuable specimens for downstream molecular assays. The Liu lab works on a full stack of technologies to facilitate the clinical adoption of 3D pathology, from sample preparation (e.g. reversible optical clearing and fluorescence labeling), high-throughput imaging with open-top light-sheet (OTLS) microscopes developed within the lab, to data processing and AI-based image triage and analysis. For AI analyses, the lab develops both traditional machine classifiers based on intuitive “hand-crafted” 3D features, and deep-learning classifiers based on sub-visual 3D features. These non-destructive large-volume digital pathology methods are synergistic with the growing fields of radiomics and genomics, which collectively have the potential to improve treatment decisions for diverse patient populations. Dr. Liu received his B.S.E. degree at Princeton and his M.S. and Ph.D. degrees in mechanical engineering at Stanford. He was a postdoc and instructor within the Molecular Imaging Program at Stanford (MIPS) before transitioning to faculty positions at Stony Brook University (2010 – 2014) and the University of Washington in Seattle (2014 – 2025). Dr. Liu is a co-founder and board member of Alpenglow Biosciences Inc., which has commercialized the non-destructive 3D pathology technologies developed in his lab. Dr. Liu’s work is funded by the NCI, NIBIB, NIDDK, DoD, NSF, ARPA-H and various foundations.

### ACADEMIC APPOINTMENTS

- Professor, Pathology
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Member, Stanford Cancer Institute

### ADMINISTRATIVE APPOINTMENTS

- Professor, University of Washington - Mechanical Engineering, Bioengineering, and of Lab Medicine & Pathology, (2014-2025)
- Assistant Professor, Stony Brook University - Biomedical Engineering, (2010-2014)
- Instructor, Stanford University School of Medicine, (2009-2010)

### HONORS AND AWARDS

- Elected Fellow, AIMBE (2025)

- Arvid and Marianne Peterson Endowed Professorship, University of Washington (2025)
- Elected Fellow, SPIE (2024)
- Elected Fellow, Optica (formerly Optical Society of America) (2023)
- Bryan T. McMinn Endowed Professorship, University of Washington (2017-2020)
- Pathway to Independence Award (K99/R00), NIH/NIBIB (2009-2014)
- Postdoctoral Fellowship Award, Canary Foundation / American Cancer Society (ACS) (2005 - 2008)
- Graduate Fellowship Award, NSF (1999-2002)
- Sau-Hai Lam *58 Prize as the top graduate in mechanical engineering, Princeton University (1999)

### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Co-founder and board member, Alpenglow Biosciences Inc. (2018 - present)

### PROFESSIONAL EDUCATION

- Postdoc, Stanford University School of Engineering & School of Medicine , Biomedical Optics (2009)
- Ph.D., Stanford University , Mechanical Engineering (2005)
- M.S., Stanford University , Mechanical Engineering (2000)
- B.S.E., Princeton University , Mechanical Engineering (1999)

### LINKS

- Google scholar link: https://scholar.google.com/citations?user=p-JSi6IAAAAJ&hl=en
- Jon Liu lab website: https://med.stanford.edu/jonliulab.html

## Research & Scholarship

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Biomedical optics

In vivo microscopy

Slide-free pathology

Three-dimensional microscopy

3D pathology

Optical biopsy

Image-guided surgery

Early detection

Artificial intelligence

Machine learning

Deep learning

Computational analysis

Computational pathology

Virtual staining

Molecular imaging

# Teaching

## STANFORD ADVISEES

**Postdoctoral Faculty Sponsor**

Lijuan Tang

# Publications

## PUBLICATIONS

- **3D reconstruction of human liver tissue at cellular resolution.** *Science advances*
  Fabyan, W. B., Fortin, C. L., Goune, D. L., Kenerson, H. L., Simmonds Bohorquez, S. P., Liu, J. T., Yeh, M. M., Carr, R. M., Yeung, R. S., Stevens, K. R.
  2026; 12 (8): eadz2299

- **Assessing the effects of a 3D pathology tissue-processing workflow on downstream molecular analyses.** *bioRxiv : the preprint server for biology*
  Baraznenok, E., Hsieh, H. C., Lan, L., Konnick, E. Q., Figiel, S., Rao, S. R., Woodcock, D. J., Mills, I. G., Hamdy, F., Valk, J. E., Carter, K. T., Yu, M., Paulson, et al
  2026

- **Detection of prostate cancer in 3D pathology datasets via generative immunolabeling.** *Modern pathology : an official journal of the United States and Canadian Academy of Pathology, Inc*
  Serafin, R. B., Lopez, J. S., Chow, S., Wang, R., Zhao, Y., Baraznenok, E., Lan, L., Bishop, K., Downes, M., Farre, X., True, L. D., Lal, P., Madabhushi, et al
  2026: 100975

- **Extracting and analyzing 3D histomorphometric features related to perineural and lymphovascular invasion in prostate cancer** *arXiv preprint*
  Chow, S. S., et al
  2026

- **3D pathology-guided microdissection.** *bioRxiv : the preprint server for biology*
  Hsieh, H. C., Gao, G., Han, Q., Brenes, D., Baraznenok, E., Yan, R., Serafin, R., Bishop, K. W., Wang, R., Konnick, E. Q., Pritchard, C. C., Figiel, S., Hamdy, et al
  2025

- **Deep-learning triage of 3D pathology datasets for comprehensive and efficient pathologist assessments.** *bioRxiv : the preprint server for biology*
  Gao, G., Yan, R., Song, A. H., Hsieh, H. C., Barner, L. A., Wang, F., Brenes, D., Chow, S. S., Wang, R., Bishop, K. W., Liu, Y., Farre, X., Divatia, et al
  2025

- **Delivery of a fibrin-binding hemostatic polymer ameliorates neurovascular damage and neural tissue loss after traumatic brain injury.** *Science advances*
  Han, Q., Brenes, D., Bishop, K. W., Pichon, T. J., Ling, M., McPheron, G. D., White, N. J., Pun, S. H., Liu, J. T., Sellers, D. L.
  2025; 11 (29): eadw7425

- **Imaging 3D cell cultures with optical microscopy** *NATURE METHODS*
  Hsieh, H., Han, Q., Brenes, D., Bishop, K. W., Wang, R., Wang, Y., Poudel, C., Glaser, A. K., Freedman, B. S., Vaughan, J. C., Allbritton, N. L., Liu, J. T. C.
  2025; 22 (6): 1167-1190

- **AI-driven Multi-cohort Analysis of 3D Prostate Gland-Skeleton Morphology for Prognosis of Biochemical Recurrence**
  Salguero, J., Medina, S., Serafin, R., Corredor, G., Manandhar, S., Mutha, P., Dhamdhere, R., Wang, R., Chow, S., Romero, E., Bishop, K., Daniel, R., Tokuyama, et al
  ELSEVIER SCIENCE INC.2025

- **A Foundation Model for Spatial Proteomics** *arXiv preprint*
  Shaban, M., et al

2025

- **Automated, Scalable, and Comprehensive Three-Dimensional Analysis of Glomeruli and Whole Nephrons in Kidney Tissues**
  Poudel, C., Brenes, D., Sandoval, R. M., Martinez-Irizarry, M. M., Dunn, K., Dagher, P. C., Liu, J. T. C., Vaughan, J. C.
  AMER SOC NEPHROLOGY.2024
- **LiverMap pipeline for 3D imaging of human liver reveals volumetric spatial dysregulation of cirrhotic vasculobiliary architecture.** *bioRxiv : the preprint server for biology*
  Fabyan, W. B., Fortin, C. L., Kenerson, H. L., Simmonds, S. P., Liu, J. T., Yeh, M. M., Carr, R. M., Yeung, R. S., Stevens, K. R.
  2024
- **Axially swept open-top light-sheet microscopy for densely labeled clinical specimens** *OPTICS LETTERS*
  Bishop, K. W., Barner, L., Baraznenok, E., Lan, L., Poudel, C., Brenes, D., Serafin, R. B., True, L. D., Vaughan, J. C., Glaser, A. K., Liu, J. T. C.
  2024; 49 (13): 3794-3797
- **Analysis of 3D pathology samples using weakly supervised AI** *CELL*
  Song, A. H., Williams, M., Williamson, D. F. K., Chow, S. S. L., Jaume, G., Gao, G., Zhang, A., Chen, B., Baras, A. S., Serafin, R., Colling, R., Downes, M. R., Farre, et al
  2024; 187 (10): 2502-2520.e17
- **Direct three-dimensional segmentation of prostate glands with nnU-Net** *JOURNAL OF BIOMEDICAL OPTICS*
  Wang, R., Chow, S. S. L., Serafin, R. B., Xie, W., Han, Q., Baraznenok, E., Lan, L., Bishop, K. W., Liu, J. T. C.
  2024; 29 (3): 036001
- **An end-to-end workflow for nondestructive 3D pathology** *NATURE PROTOCOLS*
  Bishop, K. W., Erion Barner, L. A., Han, Q., Baraznenok, E., Lan, L., Poudel, C., Gao, G., Serafin, R. B., Chow, S. S. L., Glaser, A. K., Janowczyk, A., Brenes, D., Huang, et al
  2024; 19 (4): 1122-1148
- **Triage of 3D pathology data via 2.5D multiple-instance learning to guide pathologist assessments**
  Gao, G., Song, A. H., Wang, F., Brenes, D., Wang, R., Chow, S. S. L., Bishop, K. W., True, L. D., Mahmood, F., Liu, J. T. C., IEEE
  IEEE COMPUTER SOC.2024: 6955-6965
- **Artificial Intelligence-Triaged 3-Dimensional Pathology to Improve Detection of Esophageal Neoplasia While Reducing Pathologist Workloads.** *Modern pathology : an official journal of the United States and Canadian Academy of Pathology, Inc*
  Erion Barner, L. A., Gao, G., Reddi, D. M., Lan, L., Burke, W., Mahmood, F., Grady, W. M., Liu, J. T.
  2023; 36 (12): 100322
- **Visual Assessment of 2-Dimensional Levels Within 3-Dimensional Pathology Data Sets of Prostate Needle Biopsies Reveals Substantial Spatial Heterogeneity** *LABORATORY INVESTIGATION*
  Koyuncu, C., Janowczyk, A., Farre, X., Pathak, T., Mirtti, T., Fernandez, P. L., Pons, L., Reder, N. P., Sera, R., Chow, S. S. L., Viswanathan, V. S., Glaser, A. K., True, et al
  2023; 103 (12): 100265
- **Engineering the future of 3D pathology** *JOURNAL OF PATHOLOGY CLINICAL RESEARCH*
  Liu, J. T. C., Chow, S. S. L., Colling, R., Downes, M. R., Farre, X., Humphrey, P., Janowczyk, A., Mirtti, T., Verrill, C., Zlobec, I., True, L. D.
  2024; 10 (1): e347
- **Tracking the 3D Architecture of Hundreds of Nephrons and Peritubular Capillaries in Health and Disease Using Light Sheet Microscopy and Deep Learning**
  Poudel, C., Sandoval, R. M., Wong, M. K., Liu, J. T., Vaughan, J. C., Vaughan Lab
  AMER SOC NEPHROLOGY.2023: 415
- **Miniature line-scanned dual-axis confocal microscope for versatile clinical use** *BIOMEDICAL OPTICS EXPRESS*
  Bishop, K., Hu, B., Yawhare, R., Yang, Z., Liang, D., Gao, G., Baraznenok, E., Han, Q., Lan, L., Chow, S., Sanai, N., Liu, J.
  2023; 14 (11): 6048-6059
- **Nondestructive 3D Pathology Image Atlas of Barrett Esophagus With Open-Top Light-Sheet Microscopy** *ARCHIVES OF PATHOLOGY & LABORATORY MEDICINE*
  Reddi, D. M., Barner, L. A., Burke, W., Gao, G., Grady, W. M., Liu, J. T. C.
  2023; 147 (10): 1164-1171

- **An end-to-end workflow for non-destructive 3D pathology.** *bioRxiv : the preprint server for biology*
  Bishop, K. W., Barner, L. A., Han, Q., Baraznenok, E., Lan, L., Poudel, C., Gao, G., Serafin, R. B., Chow, S. S., Glaser, A. K., Janowczyk, A., Brenes, D., Huang, et al
  2023
- **Weakly Supervised AI for Efficient Analysis of 3D Pathology Samples.** *ArXiv*
  Song, A. H., Williams, M., Williamson, D. F., Jaume, G., Zhang, A., Chen, B., Serafin, R., Liu, J. T., Baras, A., Parwani, A. V., Mahmood, F.
  2023
- **Comprehensive Surface Histology of Fresh Resection Margins With Rapid Open-Top Light-Sheet (OTLS) Microscopy** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
  Gao, G., Miyasato, D., Barner, L. A., Serafin, R., Bishop, K. W., Xie, W., Glaser, A. K., Rosenthal, E. L., True, L. D., Liu, J. T. C.
  2023; 70 (7): 2160-2171
- **3D open-top light-sheet microscopy and 3D microdissection of neuoadjuvant-treated primary prostate cancer reveals latent subclonal mutations.**
  Reder, N., Pritchard, C. C., Konnick, E. Q., Huang, H., Lerma, A., Glaser, A. K., True, L. D., Liu, J. T. C., Schweizer, M.
  LIPPINCOTT WILLIAMS & WILKINS.2023
- **Nondestructive 3D pathology with analysis of nuclear features for prostate cancer risk assessment** *JOURNAL OF PATHOLOGY*
  Serafin, R., Koyuncu, C., Xie, W., Huang, H., Glaser, A. K., Reder, N. P., Janowczyk, A., True, L. D., Madabhushi, A., Liu, J. T. C.
  2023; 260 (4): 390-401
- **Innovations in Remote Teaching of Engineering Design Teams.** *Annual Conference & Exposition : final program and proceedings. American Society for Engineering Education*
  Kang, S., Blakeney, E. A., Yasuhara, K., Kearney, K. E., Payne, S., Seibel, E., Liu, J. T., Reinhall, P., Posner, J.
  2023; 2023
- **Introduction to the Biophotonics Congress 2022 feature issue** *BIOMEDICAL OPTICS EXPRESS*
  Liu, J. T. C., Bale, G., Choe, R., Elson, D. S., Oldenburg, A., Ian, L., Tkaczyk, E. R.
  2023; 14 (1): 385-386
- **Nondestructive 3D Pathology with Light-Sheet Fluorescence Microscopy for Translational Research and Clinical Assays** *ANNUAL REVIEW OF ANALYTICAL CHEMISTRY*
  Liu, J. T. C., Glaser, A. K., Poudel, C., Vaughan, J. C.
  2023; 16: 231-252
- **A hybrid open-top light-sheet microscope for versatile multi-scale imaging of cleared tissues** *NATURE METHODS*
  Glaser, A. K., Bishop, K. W., Barner, L. A., Susaki, E. A., Kubota, S. I., Gao, G., Serafin, R. B., Balaram, P., Turschak, E., Nicovich, P. R., Lai, H., Lucas, L. A. G., Yi, et al
  2022; 19 (5): 613-+
- **In vivo microscopy as an adjunctive tool to guide detection, diagnosis, and treatment** *JOURNAL OF BIOMEDICAL OPTICS*
  Bishop, K. W., Maitland, K. C., Rajadhyaksha, M., Liu, J. T. C.
  2022; 27 (4)
- **3D Light-Sheet Microscopy and Microdissection of Primary Prostate Cancer Reveals Important Latent Sub-clonal Mutations**
  Lerma, L., Pritchard, C., Konnick, E., Haffner, M., Schweizer, M., Huang, H., Glaser, A., True, L., Liu, J., Reder, N.
  SPRINGERNATURE.2022: 620
- **Multiresolution nondestructive 3D pathology of whole lymph nodes for breast cancer staging** *JOURNAL OF BIOMEDICAL OPTICS*
  Barner, L. A., Glaser, A. K., Mao, C., Susaki, E. A., Vaughan, J. C., Dintzis, S. M., Liu, J. T. C.
  2022; 27 (3)
- **Fluorescent labeling of abundant reactive entities (FLARE) for cleared-tissue and super-resolution microscopy** *NATURE PROTOCOLS*
  Lee, M., Mao, C., Glaser, A. K., Woodworth, M. A., Halpern, A. R., Ali, A., Liu, J. T. C., Vaughan, J. C.
  2022; 17 (3): 819-+
- **Prostate Cancer Risk Stratification via Nondestructive 3D Pathology with Deep Learning-Assisted Gland Analysis** *CANCER RESEARCH*
  Xie, W., Reder, N. P., Koyuncu, C., Leo, P., Hawley, S., Huang, H., Mao, C., Postupna, N., Kang, S., Serafin, R., Gao, G., Han, Q., Bishop, et al

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- **Implementation and evaluation of team science training for interdisciplinary teams in an engineering design program** *JOURNAL OF CLINICAL AND TRANSLATIONAL SCIENCE*
  Blakeney, E., Kang, S., Henrikson, K., Liu, J. T. C., Seibel, E. J., Sprecher, J., Summerside, N., Vogel, M. T., Zierler, B. K., Posner, J. D.
  2021; 5 (1): e127
- **Intraoperative Fluorescence-Guided Surgery in Head and Neck Squamous Cell Carcinoma.** *The Laryngoscope*
  Lee, Y. J., Krishnan, G., Nishio, N., van den Berg, N. S., Lu, G., Martin, B. A., van Keulen, S., Colevas, A. D., Kapoor, S., Liu, J. T., Rosenthal, E. L.
  2021; 131 (3): 529-534
- **Harnessing non-destructive 3D pathology** *NATURE BIOMEDICAL ENGINEERING*
  Liu, J. T. C., Glaser, A. K., Bera, K., True, L. D., Reder, N. P., Eliceiri, K. W., Madabhushi, A.
  2021; 5 (3): 203-218
- **Microdissected "cuboids" for microfluidic drug testing of intact tissues** *LAB ON A CHIP*
  Horowitz, L. F., Rodriguez, A. D., Au-Yeung, A., Bishop, K. W., Barner, L. A., Mishra, G., Raman, A., Delgado, P., Liu, J. T. C., Gujral, T. S., Mehrabi, M., Yang, M., Pierce, et al
  2021; 21 (1): 122-142
- **Three-dimensional histo-morphometric features from light-sheet microscopy images result in improved discrimination of benign from malignant glands in prostate cancer**
  Koyuncu, C. F., Janowczyk, A., Lu, C., Leo, P., Alilou, M., Glaser, A. K., Reder, N. P., Liu, J. T. C., Madabhushi, A.
  edited by Tomaszewski, J. E., Ward, A. D.
  SPIE-INT SOC OPTICAL ENGINEERING.2021
- **Diagnosing 12 prostate needle cores within an hour of biopsy via open-top light-sheet microscopy** *JOURNAL OF BIOMEDICAL OPTICS*
  Xie, W., Glaser, A. K., Vakar-Lopez, F., Wright, J. L., Reder, N. P., Liu, J. T. C., True, L. D.
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- **Multi-resolution open-top light-sheet microscopy to enable efficient 3D pathology workflows** *BIOMEDICAL OPTICS EXPRESS*
  Barner, L. A., Glaser, A. K., Huang, H., True, L. D., Liu, J. T. C.
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- **FalseColor-Python: A rapid intensity-leveling and digital-staining package for fluorescence-based slide-free digital pathology** *PLOS ONE*
  Serafin, R., Xie, W., Glaser, A. K., Liu, J. T. C.
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- **Video-Mosaicked Handheld Dual-Axis Confocal Microscopy of Gliomas: Anex vivoFeasibility Study in Humans** *FRONTIERS IN ONCOLOGY*
  Fujita, Y., Wei, L., Cimino, P. J., Liu, J. T. C., Sanai, N.
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- **Performance tradeoffs for single- and dual-objective open-top light-sheet microscope designs: a simulation-based analysis** *BIOMEDICAL OPTICS EXPRESS*
  Bishop, K. W., Glaser, A. K., Liu, J. T. C.
  2020; 11 (8): 4627-4650
- **Feature-rich covalent stains for super-resolution and cleared tissue fluorescence microscopy** *SCIENCE ADVANCES*
  Mao, C., Lee, M., Jhan, J., Halpern, A. R., Woodworth, M. A., Glaser, A. K., Chozinski, T. J., Shin, L., Pippin, J. W., Shankland, S. J., Liu, J., Vaughan, J. C.
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- **Real-time video mosaicking to guide handheld in vivo microscopy** *JOURNAL OF BIOPHOTONICS*
  Yin, C., Wei, L., Kose, K., Glaser, A. K., Peterson, G., Rajadhyaksha, M., Liu, J. T. C.
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- **Light-Sheet Microscopy for 3D Pathology of a Variety of Human Tissues**
  Glaser, A., Reder, N., True, L., Liu, J.
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- **Diagnosis of All 12 Needle Cores within an Hour of a Prostate Biopsy Procedure**
  Xie, W., Reder, N., Vakar-Lopez, F., Liu, J., Glaser, A., True, L.
  SPRINGERNATURE.2020: 992-993
- **3D Open-Top Light-Sheet (OTLS) Fluorescence Microscopy of Entire Prostate Core Biopsies Improves Diagnostic Accuracy**
  Malleis, J., Glaser, A., Kang, S., Pang, K., True, L., Liu, J., Reder, N.
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- **Multi-immersion open-top light-sheet microscopy**
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- **INTRAOPERATIVE HAND-HELD LINE-SCANNED DUAL-AXIS CONFOCAL MICROSCOPY FOR VISUALIZING LOW-GRADE GLIOMAS**
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  OXFORD UNIV PRESS INC.2019: 240
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  Barner, L. A., Glaser, A. K., True, L. D., Reder, N. P., Liu, J. T. C.
  2019; 44 (18): 4451-4454
- **Open-Top Light-Sheet Microscopy Image Atlas of Prostate Core Needle Biopsies** *ARCHIVES OF PATHOLOGY & LABORATORY MEDICINE*
  Reder, N. P., Glaser, A. K., McCarty, E. F., Chen, Y., True, L. D., Liu, J. T. C.
  2019; 143 (9): 1069-1075
- **Multi-immersion open-top light-sheet microscope for high-throughput imaging of cleared tissues** *NATURE COMMUNICATIONS*
  Glaser, A. K., Reder, N. P., Chen, Y., Yin, C., Wei, L., Kang, S., Barner, L. A., Xie, W., McCarty, E. F., Mao, C., Halpern, A. R., Stoltzfus, C. R., Daniels, et al
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- **Toward Quantitative Neurosurgical Guidance With High-Resolution Microscopy of 5-Aminolevulinic Acid-Induced Protoporphyrin IX** *FRONTIERS IN ONCOLOGY*
  Wei, L., Fujita, Y., Sanai, N., Liu, J. T. C.
  2019; 9: 592
- **Trends and Challenges for the Clinical Adoption of Fluorescence-Guided Surgery** *JOURNAL OF NUCLEAR MEDICINE*
  Liu, J. T. C., Sanai, N.
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- **Label-free in vivo pathology of human epithelia with a high-speed handheld dual-axis confocal microscope** *JOURNAL OF BIOMEDICAL OPTICS*
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  Xie, W., Chen, Y., Wang, Y., Wei, L., Yin, C., Glaser, A. K., Fauver, M. E., Seibel, E. J., Dintzis, S. M., Vaughan, J. C., Reder, N. P., Liu, J. T. C.
  2019; 24 (2): 1-11
- **Modeling the binding and diffusion of receptor-targeted nanoparticles topically applied on fresh tissue specimens** *PHYSICS IN MEDICINE AND BIOLOGY*
  Kang, S., Xu, X., Navarro, E., Wang, Y., Liu, J. T. C., Tichauer, K. M.
  2019; 64 (4): 045013
- **Visualization technologies for 5-ALA-based fluorescence-guided surgeries** *JOURNAL OF NEURO-ONCOLOGY*
  Wei, L., Roberts, D. W., Sanai, N., Liu, J. T. C.
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- **Handheld line-scanned dual-axis confocal microscope with pistoned MEMS actuation for flat-field fluorescence imaging** *OPTICS LETTERS*
  Wei, L., Yin, C., Fujita, Y., Sanai, N., Liu, J. T. C.
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- **Dual-Axis Confocal Microscopy for Point-of-Care Pathology** *IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS*
  Wei, L., Yin, C., Liu, J. T. C.
  2019; 25 (1)
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  Davis, R. M., Campbell, J. L., Burkitt, S., Qiu, Z., Kang, S., Mehraein, M., Miyasato, D., Salinas, H., Liu, J. T., Zavaleta, C.
  2018; 8 (11)
- **Multidirectional digital scanned light-sheet microscopy enables uniform fluorescence excitation and contrast-enhanced imaging** *SCIENTIFIC REPORTS*
  Glaser, A. K., Chen, Y., Yin, C., Wei, L., Barner, L. A., Reder, N. P., Liu, J. T. C.
  2018; 8: 13878
- **Reaction-Driven Nucleation Theory** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Wall, M. A., Cossairt, B. M., Liu, J. T. C.
  2018; 122 (17): 9671-9679
- **Microscopic investigation of" topically applied nanoparticles for molecular imaging of fresh tissue surfaces** *JOURNAL OF BIOPHOTONICS*
  Kang, S., Wang, Y., Xu, X., Navarro, E., Tichauer, K. M., Liu, J. T. C.
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- **High-speed Raman-encoded molecular imaging of freshly excised tissue surfaces with topically applied SERRS nanoparticles** *JOURNAL OF BIOMEDICAL OPTICS*
  Wang, Y., Yang, Q., Kang, S., Wall, M. A., Liu, J. T. C.
  2018; 23 (4): 1-8
- **Identification of Tissue Invasive Fungi by 2D and 3D Light Sheet Microscopy**
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