Ji-Xin Cheng Group

Progress in 2021
Areas Representatives

Summer 2021
• SRS and Raman --- Xiaowei Ge
• Photothermal & photoacoustic --- Yeran Bai
• Cell biology --- Meng Zhang
• Microbiology --- Sebastian Jusuf
• Neuromodulation --- Yueming Li

Spring 2022
• SRS and Raman --- Hongli Ni
• Photothermal & photoacoustic --- Haonan Zong
• Cell biology --- Fukai Chen
• Microbiology --- Sebastian Jusuf
• Neuromodulation --- Nan Zheng

Fall 2021
• SRS and Raman --- Peng Lin
• Photothermal & photoacoustic --- Jian Zhao
• Cell biology --- Yuying Tan
• Microbiology --- Zian Wang
• Neuromodulation --- Linli Shi
Current funding

• NIH R35GM136223, R01HL125385, R01CA224275, R01AI141439, R01NS109794, R33CA261726
• NSF Chemical Imaging
• DoE
• Hologic
• Daylight Solutions
• Photothermal Spectroscopy Corp: R42CA244844, R43GM142346, R44EB027018
New Grants received in 2021

1. R33 CA261726 (2021 to 2024), $1.2 M
2. NIH SBIR Phase 1, Fluorescence enhanced-MIP, GM142346 $80,000, 2021
3. NIH R01 NS109794 admin supplement for dissemination of FOE, $300,000, 2021 to 2023
4. Daylight Solutions, Bond-selective phase imaging, $216,000, 2021 to 2022
5. Hologic, breast cancer detection by SRS microscopy, $300,000, 2021 to 2023
6. R01 EB032391-01, computational chemical imaging, $2,379,816, 2022 to 12/31/2025
Industrial Partners

- Hologic – breast cancer imaging
- Daylight Solutions – bond-selective phase imaging
- Photothermal Spectroscopy Corp
- Bruker – AFM
- Vibronix Inc -- AST
- Pendar Technologies – IR laser
Awards and honors

• Professor Hyeon Jeong Lee (former member), 35 innovators under 35!
• Carolyn Marar: Best poster award in 2021 QBP Research Symposium
• Haonan Lin: BME Department best paper of the year 2021
Career Advancement in 2021

1. Dr. Haonan Lin, graduated in Sept 2021, postdoc at BU till Aug 2022
3. Dr. Yeran Bai, joined UCSB as a postdoc.
4. Dr. Cheng Zong, joined Bay Spec as a scientist.
5. Dr. Ying Jiang, to join MIT as postdoc, Jan 1, 2022
6. Dr. Zhicong Chen, joined Center of Reproductive Medicine, Key Laboratory for Reproductive Medicine of Guangdong Province, The Third Affiliated Hospital of Guangzhou Medical University, Guangzhou, China
7. Fukai Chen, MS, graduated in Sept 2021, research fellow at BU till Aug 2022
8. Zian Wang, MS, to graduate in Jan 2022, research fellow at BU till Aug 2022
9. Ruyu Wang, MS, to graduate in Jan 2022.
10. Cheng is appointed as director of photonics center graduate student initiative.
New members who joined us in 2021

1. Ms. Yvonne Cancino as Lab manager
2. Hongjian He (postdoc Brandeis University)
3. Qing Xia (Postdoc from Nanjing University)
4. Carolyn Marar (BME PhD, year 2)
5. Chinmayee Dessai (BME PhD, year 2)
6. Danchen Jia (ECE PhD, year 2)
7. Yihong Xu (Phys PhD, year 2)
8. Chuan Li (ECE PhD, year 1)
9. Mingsheng Li (ECE PhD, year 1)
10. Xinyan Teng (Chem PhD, year 1)
11. Yongjie Yang (ECE MS)
12. Zian Wang (BME MS)
13. Runyu Wang (ECE MS)
14. Xinxin Xu (MSE MS)
Stimulated Raman Scattering Microscopy
Techniques and Applications

The first book to cover the rapidly emerging field of SRS Microscopy

Edited by
Ji-Xin Cheng, Boston University, Boston, USA
Wei Min, Columbia University, New York, USA
Yasuuki Ozeki, University of Tokyo, Tokyo, Japan
Dario Polli, Associate Professor of Physics, Politecnico di Milano, Italy

Stimulated Raman Scattering Microscopy Techniques and Applications describes innovations in instrumentation, technologies, chemical probe development, and various applications enabled by state-of-the-art stimulated Raman scattering (SRS) microscopy. Beginning with an introduction to the history of SRS, this book is composed of seven parts in depth exploring stimulation strategies that have been used to push the physical limits of SRS microscopy, educational probes (which increased the SRS imaging functionality), data science methods, and recent efforts in microstimulation.

This rapidly growing field needs a comprehensive resource that brings together the current knowledge on the topic, and this book does just that. Researchers who need to know the requirements for all aspects of the instrumentation as well as the requirements of different imaging applications such as different types of biological tissue will benefit enormously from the examples of successful demonstrations of SRS imaging in the book.

Led by Editor-in-Chief Ji-Xin Cheng, a pioneer in coherent Raman scattering microscopy, the editorial team has brought together various experts on each aspect of SRS imaging from around the world to provide an authoritative guide to this increasingly important imaging technology. This book is a comprehensive reference for researchers, faculty, postdoctoral researchers, and engineers.

Key Features:
- Includes every aspect from theoretical reviews of SRS microscopy to innovations in instrumentation and current applications of SRS microscopy
- Provides complete visual elements that illustrate key information, such as SRS images of various biological samples and instrument design and schematics
- Edited by leading experts of SRS microscopy, with each chapter written by experts in their given topics

Cover image: CC BY 4.0 licensed
Peer Reviewed Articles in 2021 (total 24)

Nature Reviews Methods Primers (1) review
Nature Communications (2)
Light S&A (1)
Science Advances (2)
Science Advances (1) review article
BME Frontiers (1)
Molecular Cell (1)
Matter (1)
JACS (1)
Chemical Science (1)
Advanced Science (1)
Cancer Research (1)
ACS Photonics (1)
Analytical Chemistry (3)
J Chem Phys (1)
Photobiology and Photochemistry (1)
J Phys D (1)
APL Photonics (1)
Cancers (1) review article
JoVE (1)
Peer Reviewed Articles in 2021


Peer Reviewed Articles in 2021


278. Jiabao Xu, Tong Yu, Christos E Zois, Ji-Xin Cheng, Yuguo Tang, Adrian L. Harris, Wei Huang, Unveiling cancer metabolism through spontaneous and coherent Raman spectroscopy and stable isotope probing. *Cancers*, 2021, 13, 1718. review


Important Group Events in 2021

• Group outing / Cheng’s 50th Birthday
• Yeran and Ying wedding ceremony