

Yu-Cheng Chen

Curriculum Vitae

Nanyang Technological University, Singapore
School of Electrical & Electronics Engineering/ Biomedical Engineering
Centre of Bio-Devices and Bioinformatics
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Ph.D. Biomedical Engineering



EDUCATION & BACKGROUND

The University of Michigan, Ann Arbor, USA PhD, Biomedical Engineering (Bioelectronics)	2015-2017
National Taiwan University (NTU), Taipei, Taiwan MS, Photonics and Optoelectronics	2010-2012
The University of Arizona (UA), Tucson, USA Exchange Student, Optical Science Center	2008-2009
National Central University (NCU), Taiwan BS, Optics and Photonics	2006-2010

BIO & PRIMARY EXPERTISE

Dr. Chen is the first student from the University of Michigan to accomplish PhD degree in two years. Since 2012, he has already co-authored more than 40 scientific journals/proceedings, while a start-up company is being formed to market the optofluidic biolaser technology based on his pioneer work in PhD. His research mainly focuses in the 4 scopes:

1. Bio-Lasers, Optofluidics, Microresonator biosensors
2. Biophotonics, Biomedical imaging, Cancer diagnosis
3. Neural-engineering, Bioelectronics, Laser-on-chip
4. Nanophotonics, Plasmonics, Ultrafast Optics

RESEARCH EXPERIENCE

■ Postdoc Fellow, Center for Integrative Research in Critical Care, UM Ann Arbor Advisor: Prof. Xudong, Fan. [RSC, OSA, SPIE Fellow]	Sep'17 – July'18
■ PhD Fellowship student, Optofluidics Sensing Lab , UM Ann Arbor Advisor: Prof. Xudong, Fan. [RSC, OSA, SPIE Fellow]	Sep'15 – Sep'17
■ Research Associate, Molecular Imaging Center (Biophotonics Core), NTU Advisor: Prof. Chi-Kuang, Sun. [Chairman. SPIE, IEEE, OSA Fellow]	Sep'12 – Jun'15
■ Intern, Biomedical Optoelectronics Center, Medicine School, NTU	Jan' 12 – Mar'12
■ Grad. Research Assistant, Micro/Nano-Plasmonic Devices Lab. NTU Advisor: Prof. Si-Chen, Lee. [President, IEEE, SPIE Fellow]	Aug'10 – Aug'12
■ Undergrad. Research Student, III-V Semiconductor Devices Lab, NCU Advisor: Prof. Jen-Inn, Chyi. [Dean. IEEE, SPIE Fellow]	Sep'07 – Jun'10

AWARDS & HONORS

2018	Nanyang Assistant Professorship Award (1%)	2010	Outstanding Contribution Award
2017	Finalists of OSA Tingyeli Innovation Prize	2010	Best Leadership Student Award
2017	Rackham Doctoral Research Grant Award	2010	Best Student Poster Award, College of Science
2016	Rackham Precandidate Research Award	2010	Honor of Interdisciplinary Research in Science
2016	Rackham Research Travel Grant	2008	Research Fellowship (National Science Council)
2015	Carl. A. Gerstaker Merit Fellowship (UM)	2008	Outstanding Student Award of the Year
2012	GARMIN Outstanding Student Fellowship	2007	Outstanding Student Award of the Year

SELECTED PUBLICATIONS (since 2012)

1. R. Daniel, Z. Yuan, G.E. Chang, R.W. Lau, **Y.-C. Chen***, "Enhanced Bio-Phototelectricity in a Living Photosynthetic Optical Cavity" *Advanced Science* (2020)
2. Z. Yuan, P. Guan, Z. Wang, and **Y.-C. Chen***, "Lasing-Encoded Microsensors driven by Cavity Resonant Energy Transfer" *Adv. Opt. Matt.* 7(11) (2019)
Selected as Hot Article Collection
Selected as Journal Cover
3. **Y.-C. Chen*** and X. Fan*, "Biological Lasers for Biomedical Applications" *Adv. Opt. Matt.* 7(11) (2019)
4. **Y.-C. Chen***, X. Li, H. Zhu, W-H. Weng, X. Tan, Q. Chen, X. Wu, R. Colman, and X. Fan*, "Neuron Lasers: On chip Optical Recording of Calcium Activity in Neuronal Networks". *BioRxiv* (2019)
5. X. Tan, Q. Chen, X. Li, **Y.-C. Chen**, and X. Fan*, "A Fast and Reproducible ELISA Laser Platform for Ultrasensitive Protein Quantification", *ACS Sensors*, 5, 1, 110-117 (2019)
6. X. Li, Y. Chin, X. Tan, **Y.-C. Chen**, Q. Chen, and X. Fan*, "Ultrasound Modulated Droplet Lasers". *ACS Photonics*, 6 (2), 531-537 (2019)
7. **Y.-C. Chen**, A. Nadeem, Q. Chen, and X. Fan*, "Chromatin Laser Imaging Reveals Metabolic Studies in Colon Tissue". *Biomed. Opt. Express* (2019)
8. X. Wu, Y. Wang, Q. Chen, **Y.-C. Chen**, and X. Fan*, "High-Q, low-mode-volume microsphere-integrated Fabry-Pérot cavity for optofluidic lasing applications". *Photon. Res.* 7 (1), 50-60 (2019)
Top downloads of the season
9. X. Wu, Q. Chen, P. Xu, **Y.-C. Chen**, B. Wu, R. Coleman, L. Tong, and X. Fan*, "Nanowire lasers as intracellular probes", *Nanoscale*, 10, 9729 – 9735 (2018) IF=7.1
10. **Y.-C. Chen**, X. Tan, Q. Chen, R. Coleman, and X. Fan*, "A Robust Tissue Laser Platform for FFPE Tumor Biopsy". *Lab. Chip*, 18(3) (2018)
11. **Y.-C. Chen**, X. Tan, Q. Sun, Q. Chen, W. Wang, and X. Fan*, "Laser-emission Imaging of Nuclear Biomarkers for High-contrast Cancer Screening and Immunodiagnosis". *Nature Biomed. Eng.* 1(9) 724-735. (2017)
Featured in *Nature- News and Reviews*.
Reported by *Nature Methods, Nature BME, Michigan News, ElectroOptics story*
12. Q. Chen, **Y.-C. Chen**, Z. Zhang, B. Wu, R. Colman, and X. Fan*, "An Integrated Microwell Array Platform for Cell Lasing Analysis", *Lab. Chip*, 17, 2814-2820 (2017) IF: 6.1 n/m=7%
13. **Y.-C. Chen**, Q. Chen, W. Wang, T. Zhang, and X. Fan*, "Versatile Tissue Lasers based on High-Q Microcavities", *Lab Chip*, 17, 538-548 (2017) IF: 6.1 n/m=7%
14. **Y.-C. Chen**, Q. Chen, X. Fan*, "Lasing in Blood", *Optica*, 3(8) 809-815. (2016) IF: 7.7; n/m= 5.6%
Featured as *Optica Journal Cover Story*.
Top downloads of the year in 2016.
More than 30 media coverages worldwide by:
"The New Scientists", "RSC-Chemistry World", "Daily Mail", "BioOptics World", "Phys. Org.", "Science-Alert", "Michigan Engineering", "Mirrors", "Singapore News", "Francais-Express", "Digital Trends", "YAHOO News!", "MedGadget", "Truebreaking-news", "i-Tech Post", "Engadget", "Futurism", "Big Ten Network", etc.
15. **Y.-C. Chen**, Q. Chen, X. Fan*, "Optofluidic Chlorophyll Lasers", *Lab Chip*, 16, 2228-2235. (2016) IF: 6.1, n/m=7%
Selected as HOT Article
Reported by *Lab on a Chip Blogs*
16. K.-S. Brink**, **Y.-C. Chen***, Y. Wu, D.-B. Shieh, R.-R. Reisz, C.-K. Sun, "Dietary Adaptions in the Ultrastructure of Dinosaur Dentine via Harmonic Generation Microscopy", *J. R. Soc. Interface* 13-25 (2016) * equal
Featured as *Journal Cover Story by Royal Society of Chemistry*
17. **Y.-C. Chen**, Y. Wu, K. Brink, D.-B. Shieh, R.-R. Reisz, C.-K. Sun*, "Third Harmonic Generation Microscopy Reveals Dental Anatomy in Ancient Fossils", *Opt. Lett.* 40(7): 1354-1357 (2015)

Highlighted by Optics & Photonics News

18. **Y.-C. Chen**, H.-C. Hsu, Y.-H. Cheng, C.-K. Sun*, "Third Harmonic Generation Susceptibility Spectroscopy in Free Fatty Acids", *J. Biomed. Opt.*, 9:095013 (2015)
19. M.-Y. Lin, T.-H. Tsai, Y.-L. Kang, **Y.-C. Chen**, Y.-H. Huang, L.-A. Wang, and S.-C. Lee, "Design and Fabrication of Birefringent Nano-grating Structure for Circularly Polarized Light Emission", *Opt. Express*, 2 (7). (2014)
20. M.-Y. Lin, Y.-L. Kang, **Y.-C. Chen**, C.-C. Wu and S.-C. Lee, "Plasmonic ITO-Free Polymer Solar Cell", *Opt. Express*, 52(S2). (2014)
21. **Y.-C. Chen**, Y.-T. Chang, F.-T. Chuang and S.-C. Lee*, "Enhanced Transmission of Higher Order Plasmon Modes with Random Au Nanoparticles in Periodic Hole Arrays", *IEEE Photon. Technol. Lett.*, Vol.25 No.1, (2013)
22. Y.-T. Chang*, **Y.-C. Chen**, M.-R. Tang, M.-H. Tsai, "Emission Enhancement in Tri-Layer Ag/SiO₂/Ag Plasmonic Thermal Emitter by Using Hexagonal Dimple Array as Top Layer", *IEEE Photon. Technol. Lett.*, 25 (14), (2013)
23. C.-H. Cheng, **Y.-C. Chen**, H.-H. Chen and S.-C. Lee*, "Improved Performance of Plasmonic Thermal Emitter via Incorporation of Gold Nanoparticles", *IEEE Photon. Technol. Lett.*, 25(17). (2013)
24. **Y.-C. Chen**, H.-H. Hsiao, C.-T. Lu, H.-H. Chen, H.-C. Chang and S.-C. Lee*, "Effect of Paired Apertures in a Periodic Hole Array on Higher Order Plasmon Modes", *IEEE Photon. Technol. Lett.*, Vol.24 No.22. (2012)
25. C.-T. Huang, **Y.-C. Chen** and S.-C. Lee*, "Improved photoresponse of InAs/GaAs quantum dot infrared photodetectors by using GaAs_{1-x}Sb_x strain reducing layer", *Appl. Phys. Lett.*, 100 (4) (2012)

Featured as AIP Top Frontier News

Editor's Top Picks of in 2012

26. F.-T. Chuang, P.-Y. Chen, Y.-W. Jiang, M. Farhat, H.-H. Chen, **Y.-C. Chen** and Si-Chen Lee*, "Nanoprojection Lithography Using Self-Assembled Interference Modules for Manufacturing Plasmonic Gratings", *IEEE Photon. Technol. Lett.*, (2012)

PATENTS & INVENTIONS

1. X. Fan, **Y.-C. Chen**, Q. Chen, "Laser Emission Based Microscopy", U.S. Patent No. 62/439,367. 2018
2. X. Fan, X. Li, Q. Yu, Q. Chen, **Y.-C. Chen**, "Ultrasound Modulated Lasers", U.S. Patent files 2019

SELECTED MEDIA COVERAGE

- "Microscopy: Laser-emission microscopy", *Nature Methods Research Highlights*. 2017
- "Lasing cancer biomarkers", *Nature Biomedical Engineering*. 2017
- "Laser made from human blood could help hunt down tumours", *New Scientists*. 2016
- "Scientists build a laser using human blood", *Endgadget*, 2016
- "Scientists Just Made Lasers Out of Human Blood", *ScienceAlert*. 2016
- "Laser made from human BLOOD could help find tumours". *Daily Mails*. 2016
- "Blood becomes a laser emitter for drug testing, cancer treatment", *BioOptics*. 2016
- "Turning blood into a laser emitter for drug testing, cancer treatment", *Phys. Org*. 2016
- "Revealing the Dental Anatomy of Ancient Fossils", *Optics and Photonics News*. 2014