Lun-De Liao, PhD
Associate Principal Investigator,
Institute of Biomedical Engineering and Nanomedicine,
National Health Research Institutes, Taiwan.

➢ Honor/Awards

National Innovation Award (國家新創獎), the 19th National Innovation Award by Research Center for Biotechnology and Medicine Policy, Taiwan.	2022
Tatler Generation T Award (Generation T 最具影響力且表現優秀的傑出青年), one of the most promising young leaders in Asia, selected by Tatler Taiwan.	2022
59th Ten Young Outstanding Persons (第 59 屆十大傑出青年), Ten Outstanding Young Persons Foundation, Taiwan, ROC.	2021
Taiwan TIE Award (63 of 200), selected by the Department of Industrial Technology (DoIT) from by the Ministry of Economic Affairs (MOEA) for Taiwan Innotech Expo (TIE) 2021.	2021
Selected as Featured Paper and Editor's Choice, A published paper "*In Vivo* Assessment of Hypoxia Levels in Pancreatic Tumors Using a Dual-Modality Ultrasound/Photoacoustic Imaging System" in *Micromachines* (2021, 12(6), 668) has been selected by the scientific editor of *Micromachines* journal.	2021
Young Scientist Award (年輕學者研究獎), 2021 NHRI Research Achievement Award by National Health Research Institutes (NHRI), Taiwan.	2021
National Innovation Award (國家新創獎), the 17th National Innovation Award by Research Center for Biotechnology and Medicine Policy, Taiwan.	2020
Young Investigator Award, the 9th World Congress on Bioengineering (WACBE), WACBE 2019, Taiwan.	2019
Young Investigator Award, the award was presented to Dr. Lun-De Liao by the Global Conference on Biomedical Engineering (GCBME) President at the banquet of the GCBME 2018, Taiwan.	2018

➢ Biography Brief

Lun-De Liao received his Ph.D. degree in Electrical Engineering from National Chiao Tung University (NCTU), Taiwan in February of 2012. He was a Postdoctoral Researcher at the Brain Research Center (BRC) in NCTU, Taiwan from Feb - July 2012. He proposed the world's first bio-inspired dry EEG sensors and their corresponding circuit to intelligent image the human brain dynamics under the guidance of Prof. Chin-Teng Lin (Fellow of IEEE) at BRC in NCTU, Taiwan. After that, he was a Research Scientist at the Singapore Institute for Neurotechnology (SINAPSE) at the National University of Singapore from Aug 2012-May 2014. He was a Senior Research Scientist and led the Neurophotonics Group at SINAPSE from May 2014-2016. Since 2015, he served as the Head of Publicity/Memberships for The Society for Neuroscience (SfN), Singapore Chapter, providing membership service to SfN members in Singapore. In Nov 2015, he join the Institute of Biomedical Engineering and Nanomedicine, National Health Research Institutes, Taiwan as an Assistant Principal Investigator and leading NanoNeurophotonics Lab there. In July 2020, he was promoted to Associate Principal Investigator in IBEN, NHRI, Taiwan.

Dr. Liao's research activity and expertise are focused on the topic of neurophotonics, nano-biosensors, brain-computer interfaces, biomedical devices, and their applications. Dr. Liao has made many important discoveries after he joined IBEN, NHRI. He was the first in the world to show that how the neurovascular coupling works in single cortical blood vessels via the novel photoacoustic technique with the skull intact of rats and disease models. These have been presented at both national and international meetings and received numerous recognitions. He has published over 108 peer-reviewed SCI journal papers, including Journal of Cerebral Blood Flow & Metabolism (IF: 6.2) and Pain (IF: 6.961), Advanced Materials (IF: 30.84), and Small (IF: 10.856) journals, and more than 14 issued patents.

He was selected/nominated for more than 50 international awards since 2004, including 2005 Best Paper Award from the National Society of Engineers, Taiwan; 2009 SID Travel Fellowship; 2009 IEEE Intermag Travel Fellowship; 2010 Best Paper Award from International Symposium on Biomedical Engineering. In 2011, he also won 1st place of the Young Investigator's Awards from the world association for Chinese biomedical

engineers for his contributions on the medical imaging & bioelectronics domain. He was also selected for an Outstanding Research Award of 2012 from National Chiao Tung University, for his outstanding research performance. In 2014, he was selected as First Place of IFMBE Young Investigator Award from IFMBE society. In 2021, he was selected as the 59th Ten Outstanding Young Persons in Taiwan (第 59 屆十大傑出青年) from Ten Outstanding Young Persons Foundation, Taiwan. In 2021, he was selected for the Young Scientist Award from NHRI, Taiwan. In 2022, he was selected as the Generation T Award, one of the the most promising young leaders in Asia, selected by Tatler Asia.

➢ **Selected Publications**

1. Shaoyu Yen, Hong-Yi Wu, Yuhling Wang, Chih-Mao Huang, Changwei W. Wu, Jyh-Horng Chen, and **Lun-De Liao***, "Revisiting the Effects of Exercise on Cerebral Neurovascular Functions in Rats using Multimodal Assessment Techniques," 26, 106354, *iScience,* 2023. (IF: 6.10) [*Corresponding author]
2. Yuhling Wang, Yu-Lin Chen, Chih-Mao Huang, Li-Tzong Chen, and **Lun-De Liao***, "Visible CCD Camera-Guided Photoacoustic Imaging System for Precise Navigation during Functional Rat Brain Imaging," 13(1), 107, *Biosensors,* 2023. (IF: 5.743) [*Corresponding author]
3. Ju-Yu Wu, Congo Tak-Shing Ching, Hui-Min David Wang, and **Lun-De Liao***, "Emerging Wearable Biosensor Technologies for Stress Monitoring and Their Real-World Applications," (12), 12, *Biosensors,* 2022. (IF: 5.743) [*Corresponding author]
4. Yuhling Wang, Chia-Hua Tsai, Tsung-Sheng Chu, Yun-Ting Hung, Mei-Yi Lee, Hwei-Hsien Chen, Li-Tzong Chen, Tzong-Rong Ger, Nai-Jung Chiang, Yung-Hsuan Wang, and **Lun-De Liao***, "Revisiting the cerebral hemodynamics of awake, freely moving rats with repeated ketamine self-administration using a miniature photoacoustic imaging system," 9(4):045003, *Neurophotonics*, 2022. (IF: 4.2) [*Corresponding author]
5. Chin-Teng Lin, Yanqiu Tian, Yu-Kai Wang, Tien-Thong Nguyen Do, Yao-Lung Chang, Jung-Tai King, Kuan-Chih Huang, and **Lun-De Liao***, "Effects of Multisensory Distractor Interference on Attentional Driving," DOI: 10.1109/TITS.2022.3149884, *IEEE Transactions on Intelligent Transportation Systems*, 2022. (IF: 9.1) [*Corresponding author]
6. Yuhling Wang, Tsung-Sheng Chu, Chia-Hui Tsao, Chia-Hua Tsai, Tzong-Rong Ger, Li-Tzong Chen, Wun-Shaing Wayne Chang*, and **Lun-De Liao***, "Assessment of Brain Functional Activity Using Miniaturized Head-Mounted Scanning Photoacoustic Imaging System in Awake and Freely Moving Rats," 2021, (11), 429, *Biosensors,* 2021. (IF: 5.519) [*Corresponding author]
7. Chin-Teng Lin*, Wei-Ling Jiang, Sheng-Fu Chen, Kuan-Chih Huang and **Lun-De Liao***, "Design of a Wearable Eye-Movement Detection System Based on Electrooculography Signals and Its Experimental Validation," 11 (9), 343, *Biosensors,* 2021. (IF: 5.519) [*Corresponding author]
8. Yuhling Wang, De-Fu Jhang, Tsung-Sheng Chu, Chia-Hui Tsao, Chia-Hua Tsai, Chiung-Cheng Chuang, Tzong-Rong Ger, Li-Tzong Chen*, Wun-Shaing Wayne Chang*, and **Lun-De Liao***, "An Adjustable Dark-Field Acoustic-Resolution Photoacoustic Imaging System with Fiber Bundle-Based Illumination," 11 (8), 262, *Biosensors,* 2021. (IF: 5.519) [*Corresponding author]
9. Chin-Teng Lin*, Yi-Hsin Yu, Jung-Tai King, Chi-Hsien Liu, and **Lun-De Liao***, "Augmented Wire-Embedded Silicon-Based Dry-Contact Sensors for Electroencephalography Signal Measurements," 20 (7), 3831-3837, *IEEE Sensors Journal*, 2019. (IF: 3.301) [*Corresponding author]
10. Beh Suet Theng, Yu-Min Kuo, WS Chang Wayne, Einar Wilder-Smith, Chia-Hui Tsao, Chia-Hua Tsai, Li-Tzong Chen, **Lun-De Liao***, "Preventive Hypothermia as A Neuroprotective Strategy for Paclitaxel-Induced Peripheral Neuropathy," Jul;160(7):1505-1521, *Pain*, 2019. (IF: 6.961) [*Corresponding author]
11. Aishwarya Bandla, **Lun-De Liao***, Su Jing Chan, Ji Min Ling, Yu-Hang Liu, Yen-Yu Ian Shih, Han-Chi Pan, Peter Tsun-Hon Wong, Hsin-Yi Lai, Nicolas KK King, You-Yin Chen, Wai Hoe Ng and Nitish V. Thakor, "Simultaneous Functional Photoacoustic Microscopy and Electrocorticography Reveal the Impact of rtPA on Dynamic Neurovascular Functions after

Cerebral Ischemia," Vol 38, Issue 6, *Journal of Cerebral Blood Flow & Metabolism*, 2018. (IF: 6.045) [*Corresponding author]

12. Mein Jin Tan, Han-Chi Pan, Zi-Yao Hong, **Lun-De Liao*** and Kien Voon Kong*, "Flexible Modulation of CO-Release using Various Nuclearity of Metal Carbonyl Clusters on Graphene Oxide for Stroke Remediation," Vol. 7, No. 5, *Advanced Healthcare Materials*, 2018. (IF: 6.27) [*Co-Corresponding author]
13. Jie Liu, Xiaolei Cai, Han-Chi Pan, Aishwarya Bandla, Chan Kim Chuan, Shaowei Wang, Nitish Thakor, **Lun-De Liao***, and Bin Liu*, "Molecular Engineering of Photoacoustic Performance by Chalcogenide Variation in Conjugated Polymer Nanoparticles for Brain Vascular Imaging," 1703732, *Small*, 2018. (IF: 10.856) [*Co-Corresponding author]
14. Yu-Hang Liu, Su Jing Chan, Han-Chi Pan, Aishwarya Bandla, Nicolas KK King, Peter Tsun Hon Wong, You-Yin Chen, Wai Hoe Ng, Nitish V Thakor, **Lun-De Liao***, "Integrated Treatment Modality of Cathodal-Transcranial Direct Current Stimulation With Peripheral Sensory Stimulation Affords Neuroprotection In A Rat Stroke Model," 4(4), 045002, *Neurophotonics*, 2017. (IF: 4.129) [*Corresponding author]
15. Han-Chi Pan, **Lun-De Liao**$^{+}$, Yu-Chun Lo, Jia-Wei Chen, Han-Lin Wang, Li Yang, Yao-Wen Liang, Po-Yu Huang, Ming-Hsun Yang, You-Yin Chen, "Neurovascular Function Recovery After Focal Ischemic Stroke By Enhancing Cerebral Collateral Circulation Via Peripheral Stimulation-Mediated Interarterial Anastomosis," 4(3), 035003, *Neurophotonics*, 2017. (IF: 4.129) [$^{+}$Co-first author]
16. Yang Sheng^{+}, **Lun-De Liao**$^{+}$, Aishwarya Bandla, Yu-Hang Liu, Nitish V Thakor, Mei Chee Tan, "Enhanced Near-Infrared Photoacoustic Imaging of Silica-Coated Rare-Earth Doped Nanoparticles," 70, 340-346, *Materials Science and Engineering: C,* 2017. [$^{+}$Co-first author] (IF: 5.080)
17. Xiaolei Cai, Aishwarya Bandla, Duo Mao, Guangxue Feng, Wei Qin, **Lun-De Liao***, Nitish Thakor, Ben Zhong Tang, Bin Liu*, "Biocompatible Red Fluorescent Organic Nanoparticles with Tunable Size and Aggregation-Induced Emission for Evaluation of Blood-Brain Barrier Damage," DOI: 10.1002/adma.201601191, *Advanced Materials*, 2016. (IF: 25.809) [*Co-corresponding author]
18. Xiaolei Cai, Chong-Jing Zhang, Frances Lim, Su Jing Chan, Aishwarya Bandla, Chan Kim Chuan, Fang Hu, Shidang Xu, Nitish V. Thakor, **Lun-De Liao*** and Bin Liu*, "Organic Nanoparticles with Aggregation-induced Emission for Bone Marrow Stromal Cell Tracking in a Rat PTI Model," DOI: 10.1002/smll.201601630, *Small*, 2016. (IF: 10.856) [*Co-corresponding author]
19. Yu-Hang Liu, **Lun-De Liao***, Stacey Sze Hui Tan, Ki Yong Kwon, Ji Min Ling, Aishwarya Bandla, Wen Li, Hsin-Yi Lai, You-Yin Chen and Nitish V. Thakor, "Assessment of Neurovascular Dynamics During Transient Ischemic Attack by the Novel Integration of Micro-Electrocorticography Electrode Array with Functional Photoacoustic Microscopy," 82, 455-465, *Neurobiology of Disease*, 2015. [*Corresponding author] (IF: 5.227)