Med-X SPRINGER NATURE

# Med-X IC 2026

The 3rd Med-X International Conference

## CONFERENCE PROGRAM



**July 31- August 2, 2026**

Shanghai, China

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# WELCOME

***Theme*: *Med-X Integration & Digital-Intelligent Innovation***

Welcome to the 3rd Med-X International Conference (Med-X IC 2026), held from July 31 to August 2, 2026, in Shanghai, China.

As healthcare challenges continue to evolve, innovation increasingly relies on the convergence of medicine, engineering, and digital technologies. Biomedical engineering has become a driving force in advancing precision medicine, intelligent healthcare, medical devices, regenerative medicine, and translational research. Meanwhile, rapid developments in artificial intelligence and data-driven technologies are creating unprecedented opportunities to reshape the future of healthcare.

Organized by Med-X Journal, Med-X IC 2026 serves as an international forum for researchers, clinicians, engineers, and industry leaders from around the world. Through plenary lectures, parallel symposia, panel discussions, and academic exchanges, the conference aims to showcase the latest scientific advances, encourage interdisciplinary collaboration, and promote the translation of innovative research into clinical and societal impact.

We sincerely thank all speakers, authors, reviewers, sponsors, partners, volunteers, and participants for their invaluable support and contributions. Your engagement is what makes this conference possible and enriches the exchange of ideas across disciplines and borders.

We hope that Med-X IC 2026 will inspire new perspectives, foster lasting collaborations, and contribute to the continued advancement of biomedical engineering. We wish you a productive conference and an enjoyable stay in Shanghai.



**Prof. Lisa X. Xu**

***General Chair, Med-X IC 2026***

**Professor, Vice President, Shanghai Association for Science and Technology Co-Editor-in-Chief, Med-X Journal**



**Prof. Song Li**

***General Chair, Med-X IC 2026***

**Professor and Chair, Department of Bioengineering University of California, Los Angeles**

# Med-X IC 2026

The 3rd Med-X International Conference

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Chinese Society of Biomedical Engineering

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# Med-X IC 2026

The 3rd Med-X International Conference

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**Fang Chen & Bing Han**

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### Biophotonics & Biosensors

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### Biomaterials & Regeneration Medicine

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### Cell & Molecular Engineering

**Fangfang Zhu & Weiqiang Gao**

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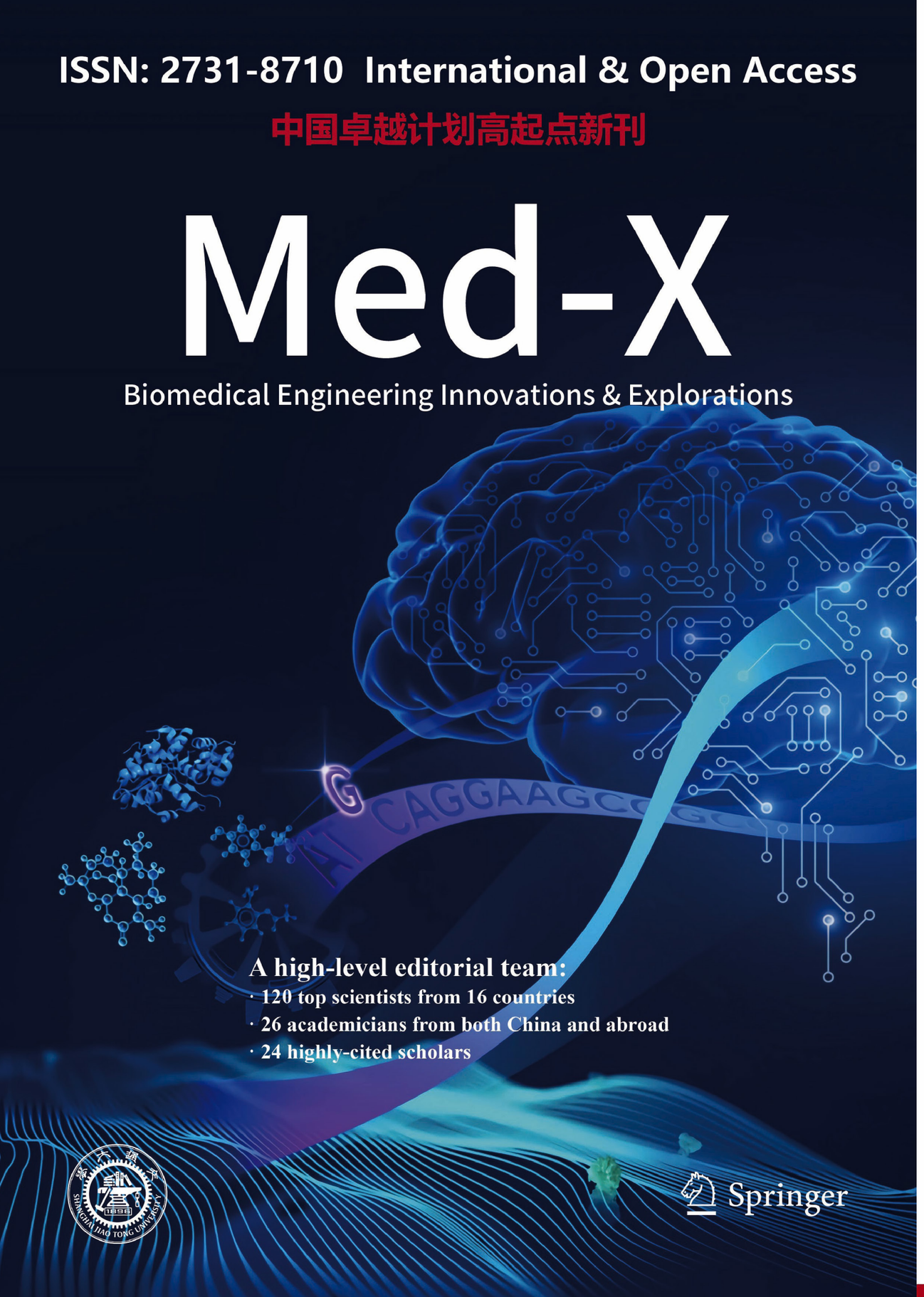


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# Med-X

Biomedical Engineering Innovations & Explorations



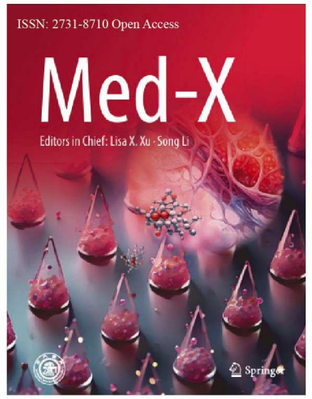
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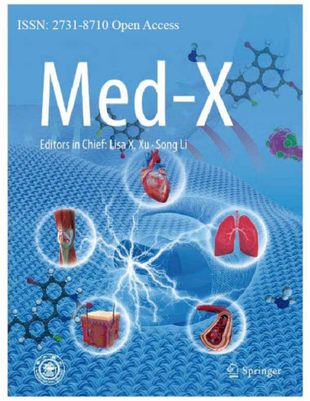
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- 24 highly-cited scholars

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# CALL FOR PAPERS




## Journal Aim & Scope

***Med-X*** was launched in 2023 by Shanghai Jiao Tong University and is published by Springer Nature.

***Med-X*** aims to provide an interdisciplinary platform for communicating the latest important discoveries and innovations in basic and applied biomedical sciences and technologies, through publishing state-of-the-art *research articles, rapid communications, case reports, reviews, perspectives and commentaries.*

## Topics Include But Not Limited To

01 Molecular & Cellular Engineering
02 Biomaterials & Tissue Engineering Drug
03 Gene and Cell Delivery Systems
04 Immunoengineering
05 Biomechanics & Mechanobiology
06 Thermal Science & Engineering
07 Biomedical Devices & Biosensors
08 Medical Robotics, Artificial Intelligence & Telemedicine
09 Biomedical Imaging

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# Conference Program

## The 3rd (2026) Med-X International Conference

**PROGRAM AT A GLANCE**
**July 31–August 2, 2026 · Bao Zhaolong Library 1954 Huashan Road, Xuhui District Shanghai**

| Time | | Content |
|---|---|---|
| July 31 (Fri) | 13:00–17:00 | Registration<br>Lobby, 1F, East Building of Bao Zhaolong Library |
| | 18:00–19:30 | Buffet<br>Please refer to your meal voucher |
| August 1 (Sat) | 09:00–12:00 | Opening · Group Photo · Plenary Talks · Panel Discussion<br>Main Venue · Room A300 |
| | 12:00–13:00 | Lunch<br>Please refer to your meal voucher |
| | 13:00–17:00 | Parallel Symposia<br>Room A303 · Room A305 · Room A403 |
| | 18:00–19:30 | Welcome Reception<br>Crowne Plaza Shanghai |
| August 2 (Sun) | 08:30–12:00 | Parallel Symposia<br>Room A303 · Room A305 · Room A403 |
| | 12:00–13:00 | Lunch<br>Please refer to your meal voucher |
| | 13:00–13:30 | Plenary Talk<br>Main Venue · Room A300 |
| | 13:30–16:30 | Parallel Symposia<br>Room A303 · Room A305 · Room A403 |
| | 16:30–17:00 | Poster<br>Corridor outside Main Venue Room A300 and Room A301 |
| | 17:00–18:00 | Plenary Talk · Award & Closing<br>Main Venue · Room A300 |
| | 18:00–19:30 | Buffet<br>Please refer to your meal voucher |

## *Detailed Program*

**Friday · 31 July**

| Time | Program |
|---|---|
| 13:00-17:00 | Registration |
| 18:00-19:30 | Buffet |

### Saturday · Main Program

**Main Venue · Room A300**

**Moderator / Chair**
**Hongen Liao / Jian Ye / Song Li**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1· Chair: Hongen Liao** | | | |
| 9:00-9:25 | | Opening | |
| 9:25-9:30 | | Group Photo | |
| **SESSION 2· Chair: Jian Ye** | | | |
| 9:30-10:00 | Plenary Talk | AI and the Future of Sports Medicine and Bioengineering (AIFX3.2): View from 10,000 Meters | Savio Lau-Yuen Woo<br>University of Pittsburgh |
| 10:00-10:30 | Plenary Talk | Powering Healthcare Intelligence with Wearable Sensing Technologies & AI | Chwee Teck Lim<br>National University of Singapore |
| 11:00-11:15 | | Break | |
| **SESSION 3· Chair: Song Li** | | | |
| 11:15-12:00 | Panel discussion | AI in Biomedical Engineering | Savio Lau-Yuen Woo, Cheng Zhu, Rong Fan, Bingmei Fu, Guoyan Zheng |
| 12:00-13:00 | | Lunch | |

## Saturday · August 1
## Medical Device

**Room A403**

**Moderator / Chair**
**Fang Chen / Bing Han**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Fang Chen** | | | |
| 13:00-13:20 | Keynote Talk | Explainable LLMs and AI agent: Problem, clinical application and future directions | Zhijian Song<br>Fudan University |
| 13:20-13:35 | Invited Talk | 非侵入式脑机接口无创深部脑刺激技术与临床研究 | Bensheng Qiu<br>University of Science and Technology of China |
| 13:35-13:50 | Invited Talk | 跨模态医学影像合成技术 | Yong Xia<br>Northwestern Polytechnical University |
| 13:50-14:05 | Invited Talk | 医学影像 AI 模型的弱标注训练和高效跨域适应研究 | Guotai Wang<br>University of Electronic Science and Technology of China |
| 14:05-14:20 | Invited Talk | 血管介入导航研究与应用 | Danni Ai<br>Beijing Institute of Technology |
| 14:20-14:35 | Invited Talk | 微创血管介入智能机器人系统 | Xianqiang Bao<br>Southeast University |
| 14:35-14:50 | Invited Talk | 全球首款高清摄像磁共振新技术汇报 | Jingfei Shen<br>United Imaging Healthcare |
| 14:50-15:10 | Break | | |
| **SESSION 2 · Chair: Bing Han** | | | |
| 15:10-15:30 | Keynote Talk | Intracellular 3D Printing | Liang Ma<br>Zhejiang University |
| 15:30-15:50 | Keynote Talk | Magnetic Microrobots for Translational Biomedicine | Li Zhang<br>The Chinese University of Hong Kong |
| 15:50-16:05 | Invited Talk | 基于智能算法与 MEMS 传感器的心血管疾病评估 | Zheng Duanmu<br>Beijing Information Science and Technology University |
| 16:05-16:20 | Invited Talk | Wearable Bioelectronics for Personalized Medicine | Minqiang Wang<br>Shanghai Jiao Tong University |
| 16:20-16:35 | Invited Talk | Wireless and Flexible Bioelectronics for Digital Healthcare | Ze Xiong<br>ShanghaiTech University |
| 16:35-16:50 | Invited Talk | Application of Intelligent Biointerfaces to Translational Neuro-Treatment | Yiyuan Yang<br>National University of Singapore |
| 16:50-17:05 | Invited Talk | Flexible Wearable Electronic Sensors for Proactive Health Management | Cui Ye<br>Shanghai Jiao Tong University School of Medicine |



## Saturday · August 1
## AI for Medicine

**Room A305**

**Moderator / Chair**
**Guoyan Zheng / Cheng Jin**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Guoyan Zheng** | | | |
| 13:00-13:20 | Keynote Talk | Artificial Intelligence in Life-Span Brain Health Study | Dinggang Shen<br>ShanghaiTech University |
| 13:20-13:35 | Invited Talk | Interpretable Medical Artificial Intelligence | Xiahai Zhuang<br>Fudan University |
| 13:35-13:50 | Invited Talk | Intelligent Medical Imaging and Analysis For Some BME Applications | Yang Chen<br>Southeast University |
| 13:50-14:05 | Invited Talk | Artificial Intelligence for Digital Pathology: From Algorithmic Innovation to Clinical Translation | Lei Cui<br>Northwestern University |
| 14:05-14:20 | Invited Talk | AI for Brain Gut Analysis | Yixuan Yuan<br>The Chinese University of Hong Kong |
| 14:20-14:35 | Invited Talk | Intelligent Microsurgical Robots | Guibin Bian<br>Institute of Automation, Chinese Academy of Sciences |
| 14:35-14:50 | Invited Talk | Artificial Intelligence in Medicine: Our Journey at West China Hospital | Kang Li<br>West China Hospital, Sichuan University |
| 14:50-15:05 | Invited Talk | 数字细胞和组织器官再生重构 | Yang Zhao<br>Peking University |
| 15:05-15:25 | Break | | |
| **SESSION 2 · Chair: Cheng Jin** | | | |
| 15:25-15:45 | Keynote Talk | Hand Perception and Interaction | Jianjiang Feng<br>Tsinghua University |
| 15:45-16:05 | Keynote Talk | From Language Harmonization to World Model: The Two Tales of Building AIVC | Qi Liu<br>Tongji University |
| 16:05-16:20 | Invited Talk | 生物医学大数据和人工智能驱动的精准医学研究 | Jia You<br>Fudan University |
| 16:20-16:35 | Invited Talk | 3D Reconstruction and Simulation of Deformable Tissues in Surgical Scenes | Wei Shen<br>Shanghai Jiao Tong University |
| 16:35-16:55 | Invited Talk | Building Scalable Perturbation Platforms for AI-Driven Drug Discovery | Dongxin Zhao<br>Shanghai Institute of Materia Medica, Chinese Academy of Sciences |

## Saturday · August 1
## Biomechanics
Room A303

**Moderator / Chair**
**Yuan Feng / Fei Fang**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Yuan Feng** | | | |
| 13:00-13:20 | Keynote Talk | Subcondral Bone in Human Osteoarthritis | X. Edward Guo<br>Columbia University |
| 13:20-13:35 | Invited Talk | Cooperative cis-interactions between ectodomains of TCRαβ and CD3 subunits enable mechanotransduction | Cheng Zhu<br>Georgia Institute of Technology and Emory University |
| 13:35-13:50 | Invited Talk | Live Cell Imaging and Sonogenetics for Cell Therapy | Peter Yingxiao Wang<br>University of Southern California |
| 13:50-14:05 | Invited Talk | Precision Diagnostics Anywhere: Digital Partitioning, Melt Coding, and Magnetofluidic Automation – From Infection/AMR to Epigenetic Cancer Detection | Jeff Tza-Huei Wang<br>Johns Hopkins University |
| 14:05-14:20 | Invited Talk | The interplay between mechanomemory and mechanohomeostasis in living cells | Ning Wang<br>Northeastern University |
| 14:20-14:35 | Invited Talk | Median Nerve Decompression by Carpal Arch Space Augmentation | Zong-Ming Li<br>University of Arizona |
| 14:35-14:50 | Invited Talk | Overcoming Cellular Mechano-Adaptation with Curved Material Interfaces | Yang Song<br>Sichuan University |
| 14:50-15:10 | | Break | |
| **SESSION 2 · Chair: Fei Fang** | | | |
| 15:10-15:30 | Keynote Talk | Watching the Chemistry of Life Unfold | Lingyan Shi<br>University of California San Diego |
| 15:30-15:50 | Invited Talk | Targeting the Coupling of Type H-like Blood Vessels and Cell Fate Transition to Delay Soft Tissue Aging | Xiao Chen<br>Zhejiang University |
| 15:50-16:05 | Invited Talk | Metastatic Lymph Node Stiffness Primes T Cell Activation Through a Mechanotransduction Axis Suppressed by PD-1 | Min Lin<br>Xi'an Jiaotong University |
| 16:05-16:20 | Invited Talk | Study mechenical regulation of cholestatic liver diseases with microphysiological systems | Yu Du<br>Institute of Mechanics, Chinese Academy of Sciences |
| 16:20-16:35 | Invited Talk | Mechanism of mechanical force upregulating gene expression and its application in mechanomedicine | Junwei Chen<br>Huazhong University of Science and Technology |
| 16:35-16:50 | Invited Talk | Mechanical Regulation of Protein Homodimerization | Mingxi Yao<br>Southern University of Science and Technology |
| 18:00-19:30 | | Welcome Reception | |

## Sunday · August 2
## Bioimaging
Room A303

**Moderator / Chair**
**Yao Li / Dengrong Jiang**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Yao Li** | | | |
| 8:30-8:50 | Keynote Talk | Preclinical models of addiction: from neural mechanisms to neuromodulation-based interventions | Yihong Yang (online)<br>National Institute on Drug Abuse, USA |
| 8:50-9:10 | Keynote Talk | Charting structural and functional connectomes across the human lifespan | Yong He<br>Beijing Normal University |
| 9:10-9:30 | Keynote Talk | Clinical Application of Brain Charts in Brain Diseases | Yaou Liu<br>Beijing Tiantan Hospital, Capital Medical University |
| 9:30-9:50 | Keynote Talk | Multimodal Neuroimaging Research on Depression Disorder | Hong Yang<br>Shanghai Children's Hospital, School of Medicine, Shanghai Jiaotong University |
| 9:50-10:10 | Keynote Talk | Non-viral vector-mediated tumor immunotherapy | Shen Liu<br>Shanghai Sixth People's Hospital, Shanghai Jiao Tong University School of Medicine |
| 10:10-10:25 | | Break | |
| **SESSION 2 · Chair: Dengrong Jiang** | | | |
| 10:25-10:45 | Keynote Talk | SIAT Advancements in MRI | Dong Liang<br>Institute of Biomedical and Health Engineering, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science |
| 10:45-11:05 | Keynote Talk | Overview of the State Key Laboratory of Magnetic Resonance Spectroscopy and Imaging and Frontiers in Medical Instrumentation | Hui Han<br>Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences |
| 11:05-11:25 | Keynote Talk | Development of Ultra-high-gradient MRI System and its Applications | Dan Wu<br>Zhejiang University |
| 11:25-11:45 | Keynote Talk | Medical imaging reconstruction via generative representations of original data | Qiegen Liu<br>Nanchang University |

## Sunday · August 2
## Biophotonics & Biosensors
**Room A305**

**Moderator / Chair**
**Bobo Gu / Ping Song**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Bobo Gu** | | | |
| 8:30-8:50 | Keynote Talk | 高非线性稀土上转换荧光及超分辨生物成像 | Qiuqiang Zhan(online)<br>South China Normal University |
| 8:50-9:10 | Keynote Talk | Stimulated Raman Histology for Label-free Cancer Diagnosis | Minbiao Ji<br>Fudan University |
| 9:10-9:25 | Invited Talk | Modulation of frontal cortical ignition during NREM sleep and general anesthesia | Bing Li<br>Shanghai Jiao Tong University School of Medicine Songjiang Research Institute |
| 9:25-9:40 | Invited Talk | Mitochondrial Homeostasis and Intelligent Diagnosis & Treatment | Lin Li<br>Xiamen University |
| 9:40-9:55 | Invited Talk | Manipulating Intermolecular Electron Transfer in Organic Photosensitizers for Type I Photodynamic Therapy | Wenbo Hu<br>Northwestern Polytechnical University |
| 9:55-10:10 | Invited Talk | Glia control of meningeal lymphatic development | Jia Li<br>ShanghaiTech University |
| 10:10-10:25 | Break | | |
| **SESSION 2 · Chair: Ping Song** | | | |
| 10:25-10:45 | Keynote Talk | DNA Frameworks-based Biosensors | Xiaolei Zuo<br>Institute of Molecular Medicine, Renji Hospital, School of Medicine, Shanghai Jiao Tong University |
| 10:45-11:05 | Keynote Talk | DNA-Encoded Bioanalysis | Yongxi Zhao<br>Xi'an Jiaotong University |
| 11:05-11:20 | Invited Talk | Size-Selective Molecular Recognition Probes | Guoliang Ke<br>Hunan University |
| 11:20-11:35 | Invited Talk | Biomedical applications of nucleases | Xin Su<br>Beijing University of Chemical Technology |
| 11:35-11:50 | Invited Talk | Development of Precise Labeling and Nano-Delivery Toolkits for Glycan Research | Peng Dai<br>Peking University |
| 11:50-12:05 | Invited Talk | Integrated Non-invasive Sweat Metabolic Sensing System for Healthcare | Shichao Ding<br>Westlake University |



## Sunday · August 2
## Biomaterials & Regenerative Medicine
**Room A403**

**Moderator / Chair**
**Song Li / Jun Fang**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Song Li** | | | |
| 8:30-8:50 | Keynote Talk | Applications of Organoids in Cardiovascular Regenerative Medicine | Chuhong Zhu<br>Army Medical University |
| 8:50-9:10 | Keynote Talk | Intervertebral disc regeneration: biomaterials and multimodal mechano-regulation | Bin Li<br>Soochow University |
| 9:10-9:25 | Invited Talk | Injectable vascular organoids for ischemic diseases | Kai Wang<br>Peking University |
| 9:25-9:40 | Invited Talk | Engineering Mechanical Immune Interfaces to Enhance CAR-T Cell Expansion and Functional Persistence | Zeyang Liu<br>Peking University |
| 9:40-9:55 | Invited Talk | AI-guided Design of Antimicrobial Polymers | Peng Zhang<br>Zhejiang University |
| 9:55-10:10 | Invited Talk | Bioactive Materials for Cardio-Oncology | Zhenhua Li<br>Southern Medical University |
| 10:10-10:25 | Break | | |
| **SESSION 2 · Chair: Jun Fang** | | | |
| 10:25-10:45 | Keynote Talk | Epigenetic editing for the treatment of cardiopulmonary fibrosis | Xiaoxiang Yan<br>Ruijin Hospital, Shanghai Jiao Tong University School of Medicine |
| 10:45-11:05 | Keynote Talk | Non-viral vector-mediated tumor immunotherapy | Xiang Gao<br>Sichuan University |
| 11:05-11:20 | Invited Talk | Early-Cannulation and Anticoagulating Small-Diamter Vascular Graft | Yuan Zhao<br>Sunna Technologies (Shanghai) Co., Ltd. |
| 11:20-11:35 | Invited Talk | First-in-man feasibility study of a decellularized biologic graft (LineMatrix®) for hemodialysis access: 12-month results | Xuefeng Qiu<br>Humatrix Medical Technology (Suzhou) Co., Ltd |
| 11:35-11:50 | Invited Talk | Quantitative analysis of biological effects of cardiac repair biomaterials | Yang Zhu<br>Zhejiang University |
| 11:50-12:05 | Invited Talk | Humanized Immune Reconstitution Mouse Models: Characteristics, Applications and Improvements | Zhenchuan Miao<br>Beijing Vitalstar Biotechnology Co. Ltd. |

## Sunday · August 2
## Cell & Molecular Engineering

**Room A303**

**Moderator / Chair**
**Weiqiang Gao / Fangfang Zhu**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Weiqiang Gao** | | | |
| 13:30-13:50 | Keynote Talk | Presentation Title: KRAS$^{G12D}$ targeted therapy sensitivity depends on interferon signaling activation in pancreatic cancer | Dong Gao<br>Shanghai Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences |
| 13:50-14:10 | Keynote Talk | Deciphering Aging Mechanisms and Developing Interventions Based on Aging Clocks | Weiqi Zhang<br>Beijing Institute of Genomics, Chinese Academy of Sciences / China National Center for Bioinformation |
| 14:10-14:25 | Invited Talk | Metabolically Armored CAR-T: From Bench to Bedside | Yugang Guo<br>Zhejiang University |
| 14:25-14:40 | Invited Talk | Chemical Decoding of Tissue Regeneration | Sida Shao<br>Westlake University |
| 14:40-14:55 | Invited Talk | Human Pluripotent Stem Cell-Derived Complex Organoid Models for Disease Modeling and Drug Discovery | Liuliu Yang<br>Institute of Hematology, Chinese Academy of Medical Sciences |
| 14:55-15:10 | | Break | |
| **SESSION 2 · Chair: Fangfang Zhu** | | | |
| 15:10-15:30 | Keynote Talk | CD300ld/ld-L orchestrates neutrophil state transition in cancer | Min Luo<br>Fudan University |
| 15:30-15:50 | Keynote Talk | Organoid Engineering and Disease Models | Donghui Zhang<br>Hubei University |
| 15:50-16:05 | Invited Talk | Development of micro/nanoscale sensing structures for biomedical applications | Xiao Li<br>Xi'an Jiaotong University |
| 16:05-16:20 | Invited Talk | Application of Blood Vessel Organoids in Deciphering the Mechanism of Toxoplasma-Induced Vascular Damage | Yang Yang<br>Nanjing Medical University |
| 16:20-16:35 | Invited Talk | Illuminating a Full-Dimensional View of Innovative Drug Research: Revvity Fluorescent Probe Labeling and In Vivo Imaging System (IVIS) | Yong Zhang<br>Shanghai Hinata Biotechnology Co., Ltd. |



## Sunday · August 2
## Soft Bioelectronics

**Room A305**

**Moderator / Chair**
**Jun Chen / Yuan Feng**

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Jun Chen** | | | |
| 13:30-13:50 | Keynote Talk | Drawn-on-Skin Bioelectronics for High-Fidelity Health Monitoring | Cunjiang Yu<br>University of Illinois Urbana-Champaign |
| 13:50-14:10 | Keynote Talk | Microfluidics towards exosomes detection and applications to cancer diagnosis | Bifeng Liu<br>Huazhong University of Science and Technology |
| 14:10-14:25 | Invited Talk | Semiconductor Fibers and Textile Systems for Embodied Intelligence | Gang Wang<br>Donghua University |
| 14:25-14:40 | Invited Talk | Flexible Self-Powered Mechanical Sensors and Their Applications in Healthcare Monitoring | Yannan Xie<br>Nanjing University of Posts and Telecommunications |
| 14:40-14:55 | Invited Talk | Sensing Mechanisms and Devices of Flexible Force Sensors | Zhihao Zhou<br>Chongqing University of Posts and Telecommunications |
| 14:55-15:10 | | Break | |
| **SESSION 2 · Chair: Yuan Feng** | | | |
| 15:10-15:30 | Keynote Talk | From 2D planar electronics to 3D gel electronics: The rise of π-conjugated hydrogel semiconductors and transistors | Shiming Zhang<br>The University of Hong Kong |
| 15:30-15:50 | Keynote Talk | Discovering Magnetoelasticity in Soft Matter for Bioelectronics | Jun Chen<br>University of California, Los Angeles |
| 15:50-16:05 | Invited Talk | Design and fabrication of in situ multifunctional sensing devices for myocardial injury repair | Kaichen Xu<br>Zhejiang University |
| 16:05-16:20 | Invited Talk | 智能可穿戴生物医学超声设备 | Yunsheng Fang<br>Xi'an Jiaotong University |
| 16:20-16:35 | Invited Talk | Flexible Piezoelectric Devices for Healthcare Monitoring | Weili Deng<br>Southwest Jiaotong University |

## Sunday · August 2
## Journal Editor Forum

**Moderator / Chair**
**Shanbao Tong / Yue Zhou**

Room A403

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| **SESSION 1 · Chair: Shanbao Tong** | | | |
| 13:30-13:50 | Keynote Talk | 从交叉创新到全球传播：医工融合时代科研成果价值提升的新路径 | Yunze Cai<br>Shanghai Jiao Tong University |
| 13:50-14:10 | Keynote Talk | Why Papers Get Rejected? - Editor in Chief's Perspective | Shanbao Tong<br>Shanghai Jiao Tong University |
| 14:10-14:25 | Invited Talk | Research Integrity in Biomedical Engineering | Karen Cheng<br>Springer Nature |
| 14:25-14:40 | Invited Talk | How High-Quality Papers Take Shape | Ze Xiong<br>ShanghaiTech University |
| 14:40-14:55 | Invited Talk | The Research Skill Library for Global Scholars | Yizhe Yuan<br>Shanghai Jiao Tong University |
| 14:55-15:10 | | Break | |
| **SESSION 2 · Chair: Shanbao Tong** | | | |
| 15:10-15:30 | Keynote Talk | The Common Statistical Misuse and Misinterpretation in Biomedical Papers | Shanbao Tong<br>Shanghai Jiao Tong University |
| 15:30-16:15 | Discussion | How AI is changing the scientific research ? | Yunze Cai<br>Shanghai Jiao Tong University<br>Karen Cheng<br>Springer Nature<br>Ze Xiong<br>Shanghai Tech University<br>Yizhe Yuan<br>Shanghai Jiao Tong University |

## Sunday · Closing Program

**Moderator / Chair**
**Jian Ye**

Main Venue ·Room A300

| Time | Talk Type | Title | Speaker |
|---|---|---|---|
| 13:00-13:30 | Plenary Talk | Repair the Heart without Touching the Heart | Ke Cheng<br>Columbia University |
| 17:00-17:30 | Plenary Talk | Intelligent Drug Delivery Cells and Devices | Zhen Gu<br>Zhejiang University |
| 17:30-18:00 | | Award & Closing | |
| 18:00-19:30 | | Buffet | |

# Plenary Speakers





# Savio Lau-Yuen Woo

**University of Pittsburgh**

## PRESENTATION TITLE

**AI and the Future of Sports Medicine and Bioengineering (AIFX3.2): View from 10,000 Meters**

## BIOGRAPHY

Dr. Savio L-Y. Woo is a Distinguished University Professor Emeritus of Bioengineering at the University of Pittsburgh. After spending 20 years at the University of California in San Diego as a Professor of Surgery and Bioengineering, he came to the University of Pittsburgh and founded the world-renowned Musculoskeletal Research Center (MSRC), a diverse multidisciplinary research and educational center in the Departments of Orthopaedic Surgery and Bioengineering. Over 645 bioengineering students, orthopaedic residents, postdoctoral fellows and staff have studied and worked with Dr. Woo.

Dr. Woo, a pioneer in bioengineering, is renowned for his more than 50 years of translational research to improve the healing and repair of tissues. Together with his team, their work has significantly impacted the management of ligament and tendon injuries including clinical paradigm shifts that have led to improved patient outcome.

Dr. Woo has been elected to the National Academy of Medicine (USA), the National Academy of Engineering (USA) and Academia Sinica (Taiwan), only one of five people who have gained all three of these honors. In 1998, he received the Olympic Prize for Sports Medicine from the International Olympic Committee and the first Olympic Gold Medal at the Nagano Games in Japan.

He has published 311 original refereed journal papers, 158 review papers and book chapters, and has edited 14 books. In addition, he has presented over 980 lectures.

## ABSTRACT

To-date, the words AI have the highest search frequency worldwide – almost twice that of words like ‘OK’ and ‘Love’ and more than four times ‘Mom’ and ‘Dad’ and the frequency continues to move upwards exponentially. Similarly, the growth curve of the AI industry matches closely in shape. For those of us engaged in the fields of bioengineering, medicine and technology, we also find it necessary to learn, to understand, and to integrate AI into our daily endeavors.

background on AIs

Around 2020, it was said that medical knowledge was doubling every 73 days. As such, generative AI (GenAI) has become well suited to harvest the large amount of data because of its tremendously high speed of calculation (upwards of 1012 to 1015 per second (teraflops and petaflops, respectively). With intelligent algorithm, Gen AI can deliver new knowledge, ideas, and solutions. To-date, Neural Network Models and Transformer (Large Language) Models are used by many platforms (Anthropic, ChatGPT, Deepseek, Gemini, LLaMA, Meta AI and so on) for simple tasks like writing text to complex grand challenges like food production, climate change and so on. Agentic AI (helps to decide what to do) and Technical AI (executive tasks with precision and reliability) are following GenAI to form a layered intelligence stack, augmenting each other to create, to coordinate, and to ensure correctness.

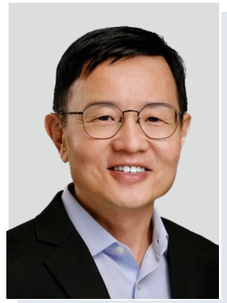
OUTLOOK

AI is predicted to revolutionize many areas of bioengineering and medicine. We will discuss the systematic usage of AI to study ACL injury and management in order to gain new scientific knowledge. These findings can then be used for injury prevention, better treatment procedures and clinical solutions for improved patient outcome.

PHILOSOPHY AND TECHNOLOGY

There are many upcoming challenges and serious concerns including societal transformation in an AI dominated world. This lecturer will present an optimistic view on using old philosophy to adopt the new AI technology.





# Chwee Teck Lim

**National University of Singapore**

## PRESENTATION TITLE

**Powering Healthcare Intelligence with Wearable Sensing Technologies & AI**

## BIOGRAPHY

Professor Chwee Teck Lim is the NUSS Chair Professor and Director of the Institute for Health Innovation and Technology at the National University of Singapore. An internationally renowned pioneer in biomedical engineering, his research in microfluidics, flexible bioelectronics, and wearable sensing technologies has not only advanced scientific frontiers but also translated into impactful healthcare innovations. He has co-authored over 520 journal publications, delivered more than 550 plenary/keynote/invited lectures worldwide, and co-founded six deep-tech startups, including one that was publicly listed in 2018, which reflects his commitment to transforming research into real-world impact.

Professor Lim is an elected Member or Fellow of 11 prestigious academies, including the US National Academy of Engineering, Royal Society (UK), Royal Academy of Engineering (UK), National Academy of Inventors (US), IUPESM, AIMBE, IAMBE, ASEAN Academy of Engineering and Technology, Singapore National Academy of Science, and Academy of Engineering, Singapore. He and his team have received over 100 national and international honours, including Singapore’s President’s Science Award, President’s Technology Award, Nature Lifetime Achievement Award for Mentoring in Science, Asia’s Most Influential Scientist Award, Clarivate Highly Cited Researcher recognition, ASEAN Outstanding Engineering Achievement Award, Asian Scientist 100, and the Wall Street Journal Asian Innovation Award. These achievements reflect the global recognition of his standing as a pioneering scientist, engineer, innovator, and entrepreneur whose work has had a profound impact on both academia and society.

## ABSTRACT

The convergence of advanced sensing hardware and artificial intelligence (AI) is reshaping the paradigm of traditional healthcare from reactive treatment to continuous, personalized, and immersive care. This presentation explores how emerging wearable sensing technologies, powered by AI, enable continuous real-world capture of physiological and behavioral data, converting complex biological streams into actionable clinical intelligence. We will highlight advancements in wearable sensors tracking vital signs, biomechanics, and biochemical markers, demonstrating their role in early disease detection and tailored interventions. Extending beyond data collection, the talk examines how integrating wearable haptics, AI analytics, and digital twins supports the creation of health metaverse platforms, opening new frontiers in realistic simulation, data visualization, and remote patient management. Ultimately, we will demonstrate how combining intelligent sensing with immersive technologies unlocks novel modalities for diagnosis and therapy, laying the foundation for a more precise, proactive, and accessible healthcare ecosystem.



# Ke Cheng

**Columbia University**

## PRESENTATION TITLE

**Repair the Heart without Touching the Heart**

## BIOGRAPHY

Dr. Cheng is the Alan L. Kaganov Professor of Biomedical Engineering at Columbia University. He currently also serves as the founding chair of Bioengineering Science Committee of American Heart Association (AHA) and chair of board of directors of American Association of Extracellular Vesicles (AAEV). He served as the Chair of the NIH Biomaterials and Biointerfaces (BMBI) study section (2022-2024). He also co-directed the NIH Comparative Molecular Medicine T32 Training Program and served as the Executive Director of Interdisciplinary Scholarship in NC State's Office of the Provost. Dr. Cheng received his B.S. degree in Pharmaceutical Engineering from Zhejiang University (2004) and Ph.D. degree in Bioengineering from University of Georgia (2008). He has been consistently name as a"highly cited researchers" by Clarivate. Research from Dr. Cheng's lab has been summarized in publications in Science, Lancet, Nature Biotechnology, Nature Materials, Nature Nanotechnology, Nature Biomedical Engineering, Science Translational Medicine, Circulation Research, European Heart Journal, and more. Dr. Cheng is an elected international member of the French National Academy of Medicine (ANM), an elected international member of Academia Europaea, an elected fellow of the Biomedical Engineering Society (BMES), International Association of Medical and Biological Engineering (IAMBE), the American Institute of Medical and Biological Engineering (AIMBE), the AAEV, and the AHA. Additionally, he currently serves as the Editor-in-Chief for Extracellular Vesicle (Elsevier) and Associate Editor for Bioactive Materials. Dr. Cheng has been devoted to the clinical application of stem cells and exosomes. He led several Investigational New Drug (IND) applications obtained from the FDA. Dr. Cheng has been recognized by numerous awards, including the prestigious Wallace H. Coulter Award for Healthcare Innovation, Clemson Award for Applied Research, AIMBE Professional Impact Award for Mentoring, AAEV Founder's Award etc.

## ABSTRACT

Delivering therapeutics to the injured heart poses significant challenges due to the need for invasive procedures and the low retention rates of those agents in cardiac tissue. While systemic approaches, such as intravenous infusion, are safe, they struggle to deliver sufficient therapeutic agents to the myocardium. Tissue engineering strategies, like cardiac patches, typically necessitate open-chest surgeries. In this talk, I will explore minimally invasive and noninvasive methods for delivering therapeutic agents to the heart for repair. Additionally, I will introduce the translational efforts in developing cardiac repair therapies and offer an outlook on the future of those drug-device combination products.



# Zhen Gu

**Zhejiang University**

## PRESENTATION TITLE

**Intelligent Drug Delivery Cells and Devices**

## BIOGRAPHY

Dr. Zhen Gu is Qiushi Distinguished Chair Professor and Associate Vice President at Zhejiang University. He also serves as the Director of the National Key Laboratory of Advanced Drug Delivery and Release Systems, and Deputy Director of the Drug Delivery Committee of Chinese Pharmaceutical Association. He is the recipient of the National Innovation Competition Award (2026), National Natural Science Award (second place) in China (2024), Sloan Research Fellowship (2016), and was selected as one of TR35 Top Innovators by the MIT Technology Reviews (2015). Dr. Gu's group studies controlled drug delivery, biomaterials, drug delivery devices, and cell therapy. As a lead contact, he has published over 300 research papers in high-profile journals, including Cell and Nature. He has also applied over 200 patents (issued: 75) that have been licensed to over 10 companies. His major inventions include glucose-responsive insulin, transdermal microneedle patch and platelet-drug conjugate, which are under clinical trials. He serves as the Executive Editor of Engineering and Associate Editor of Biomaterials, Nano Research, and Regenerative Biomaterials.

## ABSTRACT

We have long been interested in the design and delivery of intelligent therapeutics based on bioinspired strategies, particularly through engineered cells and cell-inspired systems. The precise regulation achieved by genetic circuits and mechanical/electronic devices often provides inspiration and stimulates new imagination. In this lecture, I will introduce our lab's recent innovations and translational efforts in intelligent drug delivery systems that can be triggered by disease-associated physiological and pathological signals. First, I will present biomimetic platforms based on cell-drug conjugates, including platelet-drug conjugate and mast cell-mediated delivery technique for targeted cancer therapy, and cell-/tissue-based drug release systems enabled by "cryogenic inactivation" strategies. In addition, I will discuss progress in glucose-responsive smart insulin and related controlled-release devices, as well as our recent advances in the development of long-acting drug delivery formulations and device-integrated platform technologies. I will also highlight AI technologies for augmenting performance of drug delivery devices.

# PANEL DISCUSSION
# AI in Biomedical Engineering

**Moderator**



## Song Li

**University of California, Los Angeles**

Dr. Song Li is a Chancellor's Professor in the Department of Bioengineering and Associate Dean of the Samueli School of Engineering at UCLA. He chaired the Department of Bioengineering from 2016 to 2024 and directed the Bioengineering Institute for California from 2022 to 2025. Dr. Li's work reveals how mechanical forces and engineered biomaterials regulate stem cell fate, epigenetic plasticity, and immune responses, translating mechanobiology into regenerative medicine, immunoengineering, and disease therapy. He has published over 200 peer-reviewed articles and filed 23 patents. His achievements have been recognized by many awards and honors, including the Global Biomaterials Leadership Award from the Chinese Association of Biomaterials, and election as a Fellow of the American Institute of Medical and Biological Engineering (AIMBE), the Biomedical Engineering Society, and the International Academy for Medical and Biological Engineering (IAMBE). Dr. Li is also the Co-Editor-in-Chief of Med-X Journal.



## Savio Lau-Yuen Woo

**University of Pittsburgh**

Savio L-Y. Woo is a Distinguished University Professor Emeritus of Bioengineering at the University of Pittsburgh and founder of the internationally renowned Musculoskeletal Research Center (MSRC). A pioneer in bioengineering, he has devoted more than 50 years to translational research on tissue healing and repair. His groundbreaking work on ligament and tendon injuries has transformed clinical practice and significantly improved patient outcomes. Dr. Woo is one of only a handful of scientists elected to the U.S. National Academy of Medicine, the U.S. National Academy of Engineering, and Academia Sinica (Taiwan). He received the International Olympic Committee Olympic Prize for Sports Medicine in 1998. He has published over 460 journal papers, reviews, and book chapters, edited 14 books, and delivered more than 980 invited lectures worldwide.







## Cheng Zhu

**Georgia Institute of Technology**

Dr. Cheng Zhu is Regents' Professor of Biomedical Engineering at Georgia Institute of Technology and Emory University and holds the J. Erskine Love Jr. Endowed Chair in Engineering. His research focuses on the molecular biophysics and mechanobiology of the immune and vascular systems. He pioneered the analysis of two-dimensional receptor–ligand interactions and discovered multiple force-regulated mechanisms governing protein binding and unfolding, fundamentally advancing mechanobiology. Dr. Zhu has published more than 200 peer-reviewed papers, including many in Cell, Nature, and Science family journals. He founded the joint Ph.D. program between Georgia Tech, Emory University, and Peking University in 2007. He is a Fellow of the American Institute for Medical and Biological Engineering (AIMBE) and the Biomedical Engineering Society (BMES).



## Rong Fan

**Yale University**

Dr. Rong Fan is the Harold Hodgkinson Professor of Biomedical Engineering and Pathology at Yale University. His research focuses on single-cell and spatial omics technologies for studying development, aging, and disease. He developed high-throughput platforms for multiplexed single-cell protein analysis, including the IsoCode chip and IsoLight system, which have been widely applied to CAR-T and cancer immunotherapy research. He pioneered spatial multi-omics sequencing and developed DBiT-seq for spatial co-profiling of transcriptomes and proteins, as well as spatial-ATAC-seq and spatial-CUT&Tag for spatial epigenomics. Dr. Fan co-founded IsoPlexis, Singleron Biotechnologies, and AtlasXomics. His honors include the NCI Howard Temin Career Transition Award, NSF CAREER Award, and Packard Fellowship for Science and Engineering. He is an elected Fellow of the American Institute for Medical and Biological Engineering and a member of the Connecticut Academy of Science and Engineering and the National Academy of Inventors.



## Bingmei Fu

**The City College of the City University of New York**

Dr. Bingmei Fu is a Herbert G. Kayser Professor of Biomedical Engineering at City College of New York. Her major research interest is to understand the structure-function of blood vasculature related to the transport of water, solutes and cells, including 1) the blood-brain barrier and transport in the brain, 2) glycocalyx in health and disease, and 3) tumor metastasis in the microcirculation. She is an Associate Editor of Frontiers in Physiology and has been on the editorial board of many journals including
Scientific Reports and Mechanobiology in Medicine. She is a fellow of American Institute for Medical and Biological Engineering and a fellow of Biomedical Engineering Society. Dr. Fu received her B.S., M.Eng. from the Department of Modern Mechanics of the University of Science and Technology of China, and a Ph.D. in Mechanical Engineering (Mentor: Dr. Sheldon Weinbaum) from the City University of New York.



## Guoyan Zheng

**Shanghai Jiao Tong University**

Prof. Dr. Guoyan Zheng received his Ph.D. degree from University of Bern, Switzerland in 2002. He was an associate professor at the same university until the end of 2018. In 2019, he joined Shanghai Jiao University as a full professor. His main research interest is within the field of medical image computing and computer assisted interventions. He has co-authored over 300 technical publications, patents, and peer-reviewed journal articles. His work has received more than 12000 times Google citations and won dozens of national and international awards including the second prize of the 2024 Natural Science Award of Shanghai Municipality, the Medtronic Pitvis Award of the Endoscopic Vision Challenge at MICCAI 2023, and the first prize of the 2019 Global Innovation Design Competition of Medical Robotics. He was a member of the board of directors of the International Society for Medical Image Computing and Computer Assisted Interventions (MICCAI). At this moment, he serves as a program co-chair for MICCAI 2026 and an associate editor for IEEE Transactions on Medical Imaging, Neutal Networks, IEEE Journal of Biomedical and Health Informatics, and Computerized Medical Imaging and Graphics.

# Parallel Symposia





## Zhijian Song

**Fudan University**

**PRESENTATION TITLE**

**Explainable LLMs and AI agent: Problem, clinical application and future directions**

## BIOGRAPHY

Prof. Zhijian Song is a Distinguished Professor and Ph.D. Supervisor at Fudan University. He currently serves as the Director of the Digital Medicine Research Center at Fudan University, Director of the Shanghai Key Laboratory of Medical Image Computing and Computer Assisted Intervention (MICCAI), and Chair of the Digital Medicine Technical Committee of the China Computer Federation (CCF), among other positions.

Prof. Song has long been engaged in theoretical research, technological innovation, and high-tech product development in the fields of medical image processing and computer-assisted surgery. In recent years, he has achieved outstanding accomplishments in computer-assisted surgery, medical foundation models, intelligent diagnosis and big data analytics, visual tracking, and spatial localization. He has proposed a series of novel theories, methodologies, and key technologies for intelligent diagnosis and surgical navigation.Over the past several years, Prof. Song has published more than 60 SCI-indexed journal papers and 16 papers at top-tier international conferences, authored one academic monograph, obtained 12 domestic and international invention patents, and led 12 national and provincial-level research projects. He has received four major scientific and technological awards at the provincial level or above, including the Second Prize of the National Technological Invention Award, one of China's highest honors for technological innovation.

Prof. Song has also led the development of several high-tech medical navigation systems, including the Excelim-04, Excelim-116, and Excelim-118 series neurosurgical navigation systems, as well as the Spine Nav spinal navigation system. These products have been widely adopted both domestically and internationally, entering markets across Europe, Asia, and Africa. To date, they have been used in more than 80,000 navigation-assisted surgical procedures. His contributions have significantly advanced technological innovation in China's medical equipment industry and promoted the localization of high-end medical devices.




# Bensheng Qiu

**University of Science and Technology of China**


## PRESENTATION TITLE

**非侵入式脑机接口无创深部脑刺激技术与临床研究**

## BIOGRAPHY

Professor Bensheng Qiu is Director of the Biomedical Engineering Center and Medical Imaging Center at the University of Science and Technology of China. He previously held research and faculty positions at the Shenzhen Institutes of Advanced Technology, Washington University School of Medicine, Johns Hopkins University School of Medicine, the Chinese PLA General Hospital, and the National University of Defense Technology. He has led more than 30 major research projects supported by national and international programs, including China's 973 Program, major instruments and research initiatives of the National Natural Science Foundation of China, and NIH R01 grants. Professor Qiu has received seven international awards from organizations including the RSNA, AHA, and ISMRM. He has published more than 300 SCI-indexed papers, holds over 140 patents, and has supervised more than 100 graduate students. In recent years, his team has developed innovative clinical technologies—including intraoperative MRI systems, mobile MRI diagnostic vehicles, and neuromodulation systems—that have been deployed in more than 1,000 healthcare institutions. He also serves on several national academic and professional committees in biomedical engineering, medical physics, and medical imaging.

## ABSTRACT

随着脑机接口上升为国家新兴产业，无创精准的神经调控技术成为前沿热点。传统深部脑刺激存在有创与费用高等局限，而常规无创神经调控技术难以兼顾刺激的深度与精度。时域干涉刺激（TIS）创新性地利用高频交流电干涉，能够实现对深部脑区的无创精准调控。本报告将介绍团队在该领域的研究进展，重点展示自主研究的多通道 TIS 系统与参数优化算法，成功实现了多靶点的协同精准调控。最后，结合动物实验与多中心临床数据，证实 TIS 的高全性以及在改善帕金森病、抑郁症、特发性震颤等疾病的疗效性，并展望其在脑卒中、阿尔茨海默病等神经系统疾病中的应用前景。




# Yong Xia

**Northwestern Polytechnical University**


## PRESENTATION TITLE

**跨模态医学影像合成技术**

## BIOGRAPHY

夏勇，西北工业大学人工智能学院教授、博士生导师、空天地海一体化大数据应用技术国家工程实验室成员，研究方向为医学影像智能计算，近 5 年在该方向学术期刊和会议上发表论文 100 余篇，谷歌引用 2.1 万次，H-index=72，担任中国体视学学会理事、中国计算机学会数字医学分会常委、IEEE-TMI Guest AE 等，多次担任 MICCAI、ICASSP、IJCAI、AAAI 等国际会议 Area Chair，入选全球前 2% 顶尖科学家终身科学影响力排行榜。个人主页：https://teacher.nwpu.edu.cn/yongxia.html

## ABSTRACT

由于不同影像模态存在一定互补性，多模态影像在临床应用中通常能够比单模态影像提供更多信息。然而，多模态医学影像的获取会遇到采集时间长、费用高、可能增加辐射剂量等困难。因此，人们期待能够使用图像处理技术进行跨模态医学影像合成，即使用某一种（或一些）模态的医学影像去生成另一种（或一些）模态的医学影像。跨模态医学影像合成虽然能为多模态影像诊断带来便利，但也存在一些技术挑战，例如临床失效问题，即合成影像和真实影像在诊断性能上具有明显的差异。当前，研究者们大多从模型本身入手，通过提高模型的表示能力或者设计针对具体任务的约束条件来提高合成影像的质量，所开发的跨模态医学影像合成技术已在医学影像智能计算的诸多方向中有所应用，给许多问题的解决带来了新思路。本报告将围绕神经退化性疾病和脑胶质瘤的影像诊断，介绍报告人课题组开展的跨模态医学影像合成技术研究和经验体会，并探讨相关研究的机遇与挑战。




# Guotai Wang

**University of Electronic Science and Technology of China**


## PRESENTATION TITLE

**医学影像 AI 模型的弱标注训练和高效跨域适应研究**

## BIOGRAPHY

王国泰，电子科技大学教授，博导。2011 年取得上海交通大学生物医学工程和智能科学与技术双学位，2018 年取得伦敦大学学院博士学位，同年 10 月回国加入电子科技大学机械与电气工程学院任特聘副教授，2023 年入选国家万人计划青年拔尖人才，并晋升教授。研究方向为人工智能、机器视觉、医学图像计算，在领域顶级期刊及会议 IEEE TPAMI、IEEE TIP、IEEE TMI、Medical Image Analysis、IPMI、MICCAI、CVPR 等发表高水平论文 100 余篇，谷歌学术引用量 19000 余次，8 篇论文入选 ESI 高被引，入选斯坦福大学发布的《年度科学影响力排行榜》全球前 2%。担任 Pattern Recognition、Medical Physics 期刊副主编，Medical Image Analysis 客座编辑，四川省肿瘤学会大数据与人工智能专委会委员、医学图像计算青年研讨会（MICS）委员。指导学生多次在 MICCAI 医学图像分割挑战赛中获得国际冠军、亚军。

## ABSTRACT

近年来，医学影像 AI 模型取得了显著的进步，然而在实际开发和部署过程中面临两个重要难题：一是模型训练阶段需要海量的标注数据，存在标注成本高、精确标注难以获取的问题；二是部署阶段面临测试数据和训练数据的分布差异，导致难以在未见过的数据域上保持稳定的性能。针对上述问题，报告人近年来在降低 AI 模型的标注成本、提高其测试时的泛化性和适应性进行了系列研究。本报告将首先介绍报告人在弱监督、半监督、噪声标签学习、主动学习、自监督学习等多种学习范式中的探索，以从低质量标注中训练较高性能的 AI 模型，其次介绍基于特征解耦、伪标签过滤等方法的模型跨域泛化和适应的工作。最后，探讨如何利用影像基础模型减少下游任务中的标注成本并实现基础模型的高效适配。




# Danni Ai

**Beijing Institute of Technology**


## PRESENTATION TITLE

**血管介入导航研究与应用**

## BIOGRAPHY

准聘教授，国家级青年人才，北京市重点实验室副主任，主持国自然面上 / 青年项目、国家重点研发计划课题、国家重大科技专项子课题等，以第一 / 通讯作者在 IEEE TPAMI、IJCV 等权威明刊发表 SCI 论文 35 篇，以第二完成人出版专著，以第一发明人授权国家发明专利 23 项，成果转化获国家三类医疗器械注册证 1 项、二类证 2 项，作为主要完成人获中国电子学会科技进步奖一等奖、日内瓦发明展金奖、北京市教学成果一等奖等。

## ABSTRACT

本报告围绕 X 光引导血管介入导航的临床需求、关键理论、核心部件与转化应用展开，系统介绍了多模态影像融合与智能感知赋能血管介入精准诊疗的新路径。报告首先分析血管介入手术在病变诊断、空间定位和动态导航方面面临的复杂挑战，指出病变评估依赖术者经验、二维投影图像空间信息不足，以及患者体位变化、呼吸和心搏运动导致术前术中血管形态与位置不一致等共性问题。报告重点展示了血管结构清晰化识别、弹性形变精细化补偿、时空运动精准化跟踪等方面的理论与方法创新，并介绍了团队自主研发的高精度磁定位跟踪核心部件，其性能达到医疗级质量标准，具备稳定量产能力，突破了手术导航核心部件长期依赖进口的技术瓶颈。相关技术在提升病变诊断客观性、介入器械定位精度和复杂手术导航能力等方面具有重要应用价值与产业转化前景，为推动血管介入治疗向智能化、精准化和国产化发展提供了新思路。




# Xianqiang Bao

**Southeast University**


## PRESENTATION TITLE

**微创血管介入智能机器人系统**

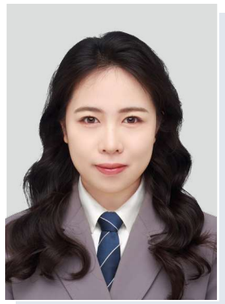
## BIOGRAPHY

包贤强，东南大学教授，博士生导师，国家高层次青年人才，德国洪堡学者。研究方向包括医疗机器人、磁控机器人、人工智能交叉等。以第一 / 共一在 Nature、Science Advances、以及 IEEE Transactions 系列 ( 包括 TRO、TMECH、TIE 等 ) 期刊或会议上发表研究论文 20 余篇，其中 1 篇论文被遴选为 Science Advances 封面文章。以科研骨干研发的血管介入手术机器人，完成了人体临床实验和动物实验，目前已实现技术转化，获得了三类医疗器械许可证，并实现了销售。以科研骨干参与开发的超声胎儿检测机器人，目前已成立初创公司来推进产业化。申请欧盟专利 1 项，授权中国发明专利 15 项。获得 IEEE ICMA 国际会议自动化最佳论文奖、MARSS 国际会议最佳大会论文奖提名奖、自动化学会科技进步奖二等奖等。研究获多个官方及权威平台报道，包括学术期刊《Science》官方账号介绍，德国联邦研究、技术与航天部官方平台 Research in Germany 报道，以及德国科研新闻平台 idw 报道等。

## ABSTRACT

心脑血管疾病发病率持续上升，血管介入手术因其创伤小、恢复快、疗效明确，已成为临床诊疗的重要手段。传统介入手术高度依赖医生经验，术中长期暴露于 X 射线环境，并存在操作精度、力感知不足及复杂血管导航困难等问题。围绕上述临床需求，开展了血管介入手术遥操作机器人及新型主动导丝的系统研究。基于商用导管和导丝，构建了血管介入遥操作机器人系统，重点研究了主从遥操作、多器械协同操作、术中力感知与力反馈、安全控制策略等关键技术，提升了介入操作的精准性、安全性与可控性。该系统已完成动物实验和临床实验验证，并实现了初步临床转化。进一步地，自主开发了一种磁驱动导丝，结合光声成像技术，在无需依赖 X 射线的条件下，实现血管内导航、高精度成像以及射频治疗和光动力治疗等多功能集成，为未来低辐射、精准化、智能化血管介入诊疗提供了技术参考。






# Jingfei Shen

**United Imaging Healthcare**


## PRESENTATION TITLE

**全球首款高清摄像磁共振新技术汇报**

## BIOGRAPHY

Please provide a brief professional biography in English (approximately 100–200 words), written in the third person, for inclusion in the conference program booklet and conference website.

Jingfei Shen currently works as a Product Support Engineer at Shanghai United Imaging Healthcare Co., Ltd. She earned both her Bachelor’ s and Master’ s Degrees in Biomedical Engineering from Southeast University. Throughout her academic training, she contributed to multiple research activities, including the Chinese Child Brain Development Project (CCBD), a major research program under the National Science and Technology Innovation 2030 - Brain Science and Brain-inspired Intelligence Initiative that tracks brain and cognitive development of school-age children. She also took part in a virtual simulation experiment on magnetic resonance imaging principles, laying a solid technical foundation for her understanding of MRI systems and neuroimaging workflows.

## ABSTRACT

The uMR Ultra developed by Shanghai United Imaging Healthcare (UIH) revolutionizes traditional magnetic resonance by shifting static anatomical ‘photography‘ to real-time physiological ‘videography’, fundamentally overcoming the long-standing industry bottleneck of motion artifacts in MR scanning.

The system is constructed upon the proprietary uAIFI.LIVE integrated intelligent architecture, which synergizes high-performance hardware arrays and end-to-end artificial intelligence algorithms to achieve comprehensive spatio-temporal decoding of in vivo human states. Its hardware framework comprises a 70 cm wide patient bore, a 3.5 MW gradient power amplifier supplying a peak gradient strength of 100 mT/m and slew rate of 200 T/m/s, a 144-channel parallel radiofrequency (RF) transmission system, and a full series of high-density SuperFlex coil arrays with 24–48 dedicated channels for whole-body, thoracic, articular and extremity imaging. These configurations enhance signal sensitivity for high-resolution anatomical delineation while reducing acoustic noise to improve patient tolerance during scanning.

Embedded AI modules cover the entire imaging pipeline, including automated motion capture (MoCap), deep learning-based 2D/3D reconstruction, inline K-space motion correction and automated image quality surveillance (ImageGuard). Such algorithmic optimizations shorten scan duration without deteriorating signal-to-noise ratio or spatial resolution, and standardize imaging reproducibility across multi-center clinical practices.

As a LIVE-capable MR platform, the uMR Ultra provides novel access to real-time in vivo physiological information, optimizes clinical scanning workflows, facilitates consistent full-body diagnostic evaluation, and supports advanced translational imaging research.



# Liang Ma

Zhejiang University

## PRESENTATION TITLE

**Micro/nano Biomanufacturing**

## BIOGRAPHY

Liang Ma, Associate Professor at the School of Mechanical Engineering, Zhejiang University, and Visiting Scholar at the University of Cambridge. He obtained his Ph.D. from Mechanical Engineering Department in University of Washington in 2012. His research includes the use of 3D bioprinting technology, micro nano biomanufacturing technology, and microfluidic chip technology to accurately construct in vitro pharmacological models of diseases, and to conduct a series of new biomedical diagnostic and therapeutic methods such as drug delivery micro nano robots and disease drug screening chips. He has completed the world's first 3D micro nano structure printing in suspended living cells. He has published more than 80 high-level SCI papers including Advanced Materials, Biomaterials, Bioactive Materials, International Journal of Extreme Manufacturing, Engineering and have been cited more than 4000 times. He served as the Deputy Director of the editorial office for the journal Bio-Design and Manufacturing. (JCR Q1, IF=7.9) .He serves as a committee member of multiple societies and industry associations, including the standing committee member of Organoids and Organ- on-Chip Branch of the Chinese Society of Biomedical Engineering. Authorized over 20 invention patents and won one gold medal at the 2022 Geneva Invention Exhibition.

## ABSTRACT

Micro/nano biomanufacturing is a cutting-edge interdisciplinary field that integrates micro/nano manufacturing technology in biomedicine. It is committed to designing, processing, and constructing structures, devices, or systems with biological functions at the micrometer to nanometer scale, and is widely used in biomedical, tissue engineering, drug development, and precision medicine. We have successfully constructed vascularized liver tissue models and liver fibrosis models, microfluidic circulating tumor cell capture chips. Using advanced additive manufacturing technologies such as suspension extrusion printing, two-photon polymeration (TPP), and volumetric 3D printing. We have completed the world's first micro nano three-dimensional structure manufacturing in suspended living cells. This provides a new manufacturing method for the construction of in vitro pharmacological models and the development of precision biomedicine.



# Li Zhang

The Chinese University of Hong Kong

## PRESENTATION TITLE

**Magnetic Microrobots for Translational Biomedicine**

## BIOGRAPHY

Li Zhang is a Professor in the Department of Mechanical and Automation Engineering (MAE) and a Professor by Courtesy in the Department of Surgery at The Chinese University of Hong Kong (CUHK). Dr. Zhang's primary research interests include small-scale robotics and their applications for translational biomedicine. He has authored or co-authored over 400 publications (H-index: 98), including Science Robotics (5), Nature Machine Intelligence (3), Nature Reviewers Bioengineering (3), Nature Materials, Nature Biomedical Engineering, Nature Synthesis as the corresponding author. His research work on artificial bacterial flagella was indexed by the Guinness Book of World Records 2012 for the "Most Advanced Mini Robot for Medical Use." And his research works on magnetic slime robot and microrobotic swarm for endovascular application was selected as "Top 10 Innovation and Technology News in Hong Kong" in 2022, 2023 and 2024. Dr. Zhang is elected as Fellow of ASME, IEEE, RSC, AAIA, HKIE, and is recognized as a distinguished young scholar of China-America Frontiers of Engineering in CAFOE 2026. He serves as Senior Editor for IEEE T-ASE and IEEE T-RO, and as Associate Editor for Science Advances (AAAS)

## ABSTRACT

Magnetic microrobots represent an emerging minimally invasive platform with tremendous potential for precision medicine and translational biomedicine. This presentation will systematically introduce our recent progress in magnetic microrobots, from individual and modular designs to microswarms.




# Zheng Duanmu

**Beijing Information Science and Technology University**


## PRESENTATION TITLE

**基于智能算法与 MEMS 传感器的心血管疾病评估**

## BIOGRAPHY

端木正，北京信息科技大学仪器科学与光电工程学院副教授、硕士生导师，西安交通大学博士，曾于英国格拉斯哥大学 SoftMech 数学研究中心开展访问研究。曾任职于乐普（北京）医疗器械股份有限公司，具有心血管医疗器械产业研发与高校科研的交叉经历。

主要从事 MEMS 芯片与智能传感器、人工智能与图神经网络、多模态医学图像建模、计算生物力学及医疗器械研究。主持国家重点研发计划课题“高性能声音敏感元件及传感器——硅基 MEMS 膜结构热—电—力—声耦合机理及特性”，围绕 MEMS 压力与声振传感器、冠状动脉血流动力学、连续动脉血压预测、物理信息神经网络及新型医疗器械开展系统研究。

近年来，相关成果发表于 Applied Physics Letters、Annals of Biomedical Engineering、International Journal of Oral Science、Engineering Applications of Artificial Intelligence 等期刊。近期完成的主要成果 A Physics-Informed Kolmogorov–Arnold Graph Attention Network for Solid Mechanics on Arbitrary Geometries 研究融合 Kolmogorov–Arnold 网络、图注意力机制和最小势能原理，面向复杂非结构几何建立物理约束快速力学仿真方法，为个体化生物力学分析和医疗器械优化提供了新的技术路径。

相关研究还形成了微元神经算子血流动力学计算、MEMS 膜图神经网络仿真、硅基 MEMS 器件多物理场性能评估及人工智能辅助材料设计等多项授权发明专利。其研究致力于贯通“敏感材料—MEMS 芯片—生理信号—物理模型—人工智能—医疗器械”的技术链条，为精准医疗和智能医疗装备提供兼具物理可信性与工程可实施性的解决方案。

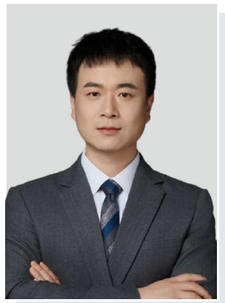
## ABSTRACT


随着微纳传感、人工智能和计算医学的快速发展，生物医学工程正在由单一生理参数测量，逐步转向多模态感知、个体化建模和智能辅助决策。然而，现有医疗智能系统仍面临生理信号质量不稳定、复杂人体机制难以描述、数据驱动模型缺乏物理一致性以及算法与医疗器械相互割裂等问题。本报告围绕“感知—建模—智能—应用”的技术链条，介绍基于智能算法与 MEMS 传感器的心血管疾病评估的研究进展。

在智能感知方面，报告将介绍面向心血管和低频生理信号检测的 MEMS 压力传感器、声振一体化 MEMS 传感器及相关医疗仪器，通过敏感结构设计、多物理场耦合仿真、封装测试与智能补偿，提高微弱生理信号的获取能力。在智能计算方面，结合连续动脉血压波形预测、冠状动脉多尺度血流动力学、图注意力网络、Kolmogorov–Arnold 网络和神经算子等研究，探索数据驱动模型与生理机制、控制方程和能量约束的深度融合。同时，进一步介绍大语言模型与先进晶体表示在压电半导体材料逆向设计中的应用，以及图神经网络在 MEMS 器件和复杂生物组织快速仿真中的研究。

上述研究逐步形成了从新型敏感材料和 MEMS 芯片、智能生理信号处理、个体化物理建模，到医疗器械设计与临床辅助评估的完整技术路径。报告最后将讨论智能感知、物理模型和人工智能协同发展的关键问题，包括跨患者泛化、不确定性量化、多模态信息融合、端侧实时计算以及临床验证。相关研究有望为心血管疾病无创评估、个体化生物力学分析和新型智能医疗器械提供具有物理可信性和工程可实施性的技术基础。




# Minqiang Wang

**Shanghai Jiao Tong University**


## PRESENTATION TITLE

**Wearable Bioelectronics for Personalized Medicine**

## BIOGRAPHY

Dr. Minqiang Wang is currently tenure-track associate professor in Shanghai Jiao Tong University at Global Institute of Future Technology, before joining SJTU, he was a postdoctoral scholar at California Institute of Technology, under the supervision of Dr. Wei Gao. His research is interdisciplinary and focused on developing new types of versatile energy materials and bioelectronic wearable systems that could be used for fundamental and applied biomedical studies. His research interests include Nano-materials, Wearable devices, Biosensors, Bioelectronics, Analytical electrochemistry, Nanotechnology, Microfluidics, Personalized medicine, Electrocatalysis.

Dr. Minqiang Wang has published 21 scientific papers in journals such as “Nature Materials, Nature Biomedical Engineering, Nature Nanotechnology, Chemical Reviews, etc.” as the first author or corresponding author. A total of citations is over 8,000, and h-index is 41. He won the first-tier prize of Baxter Young Investigator (one out of six around the world).

## ABSTRACT


The rising research interest in personalized medicine promises to revolutionize traditional medical practices. This presents a tremendous opportunity for developing wearable devices toward predictive analytics and treatment. In this talk, I will introduce our efforts in developing wearable biosensors for non-invasive molecular analysis. Such wearables can autonomously access body fluids (e.g., human sweat) across the activities and continuously measure a broad spectrum of analytes including metabolites, nutrients, hormones, and drugs. Laser engraving and inkjet printing are used to manufacture high-performance nanomaterials-based biosensors at large scale and low cost. The clinical value of our wearable systems is evaluated through various human trials toward precision nutrition, stress/mental health assessment, chronic disease management, and drug personalization. These wearable technologies could open the door to a wide range of personalized monitoring, diagnostic, and therapeutic applications.




# Ze Xiong

**ShanghaiTech University**


## PRESENTATION TITLE

**Wireless and Flexible Bioelectronics for Digital Healthcare**

## BIOGRAPHY

Dr. Xiong is an Assistant Professor at ShanghaiTech University. His research focuses on the development and application of wireless and flexible bioelectronics to bring digital intelligence to clinical and personalized healthcare. He has published more than 60 papers in journals including Nature Biomedical Engineering, Nature Materials, Science Advances, and Advanced Materials. His work has been featured by media outlets such as Reuters, Scientific American, AAAS, AIChE, People's Daily, and XinhuaNet. He has filed 15 patent applications (2 PCT and 1 U.S.), and has contributed one book chapter. He serves on the Youth Editorial Boards of Med-X, FlexMat, and The Innovation Materials. His honors include the Distinguished Young Scholar of China-America Frontiers of Engineering, jointly issued by the U.S. National Academy of Engineering and the Chinese Academy of Engineering, as well as the Emerging Investigator of China Award, the MINE Young Scientist Award, the Journal of Materials Chemistry C Emerging Investigator, the iCANX Young Scientist Award Finalist, the Shanghai Overseas High-Level Talent award, and the Swissnex Fellowship. He was awarded the Young Scientists Fund B, formerly known as the Excellent Young Scientists Fund in 2025.

## ABSTRACT

The seamless integration of advanced wireless technologies with flexible electronics is enabling a new generation of wearable and implantable bioelectronic sensors, with strong potential to advance digital healthcare. Among the many unmet clinical needs, postoperative wound management remains a critical challenge. Early detection of surgical complications is often limited by the lack of technologies that can directly interface with wound sites and reliably transmit data to caregivers for timely intervention. This talk will highlight three recent developments: (1) a wireless, flexible DNA–hydrogel biosensor that conformally interfaces with wounds and enables smartphone-based infection monitoring; (2) a wirelessly operated bioelectronic suture capable of in situ monitoring of physicochemical conditions in deep surgical wounds; and (3) a lotus-inspired, low-friction multiphasic minisensor for wireless intracranial pressure monitoring, exhibiting near-ideal aeroelastic performance. Collectively, these wireless and flexible bioelectronic platforms represent an important step toward scalable digital medicine and improved patient outcomes.






# Yiyuan Yang

**National University of Singapore**


## PRESENTATION TITLE

**Application of Intelligent Biointerfaces to Translational Neuro-Treatment**

## BIOGRAPHY

Dr. Yang joined the Department of Biomedical Engineering and N.1 Institute for Health at NUS in August 2024 as an Assistant Professor. He was awarded for the Presidential Young Professorship. He earned his Ph.D. in Mechanical Engineering from Northwestern University in 2021 and completed his postdoctoral research at the Massachusetts Institute of Technology in 2024. His research focuses on developing wireless optogenetic devices for exploring neural dynamics and biorobotics. Additionally, he is working on ingestible devices designed for long-term continuous monitoring of activity and pathology in the gastrointestinal tract, as well as closed-loop medication delivery. His contributions have resulted in world-class publications, garnering international recognition; his work was ranked #1 among similarly aged articles in Nature Neuroscience according to Altmetric and featured in over 50 news outlets, including "The Times," "New York Times," and "Science News." In 2024, he received the "Outstanding Young Scientist" award from Microsystems & Nanoengineering.

## ABSTRACT

The convergence of bioelectronics, micro/nanofabrication, and intelligent data analytics is creating new opportunities to interface with living systems across multiple biological scales. In this talk, I will present our recent efforts to develop intelligent biointerfaces for both in vivo neural modulation and in vitro organoid monitoring, with the shared goal of advancing translational neuro-biomedicine. On the in vivo side, we are developing thin, flexible, battery-free wireless optogenetic devices that integrate microscale light sources, active electronics, and mechanically compliant architectures for subdermal implantation, enabling programmable and high-resolution neuromodulation in freely behaving animals. These systems provide new tools to study neural encoding, artificial perception, and social behavior with minimal disruption to natural movement. On the in vitro side, we are developing an intelligent multimodal electrochemical sensing platform compatible with conventional culture well plates for continuous, real-time, and label-free monitoring of organoids. By combining arrayed biosensors with AI-driven signal interpretation, this platform aims to transform organoid cultures from endpoint "black-box" assays into dynamic, feedback-enabled systems for disease modeling and drug screening. Together, these two research directions establish a unified framework in which advanced biointerfaces not only interrogate and modulate complex biological systems, but also support the development of scalable, human-relevant technologies for neuroscience, precision medicine, and translational biomedical innovation.



# Cui Ye

**School of Public Health, Shanghai Jiao Tong University**
**School of Medicine**

## PRESENTATION TITLE

**Flexible Wearable Electronic Sensors for Proactive Health Management**

## BIOGRAPHY

Dr. Cui Ye completed her postdoctoral training at the California Institute of Technology (Caltech) in early 2025 and subsequently joined Shanghai Jiao Tong University School of Medicine as an independent Principal Investigator, doctoral supervisor, and discipline leader, where she leads the Flexible Sensing and Proactive Health research group. Her research centers on flexible electronic sensing technologies, with particular emphasis on wearable biosensors, noninvasive sweat monitoring, electrochemical analysis, microfluidics, and personalized digital health management. Dr. Ye has published over 50 peer-reviewed articles, receiving more than 4,550 citations with an h-index of 32. As a first or corresponding author, she has authored 22 publications in leading journals including Nature Nanotechnology, Nature Materials, and Chemical Society Reviews, with her work highlighted by Nature and other major scientific outlets.

She is a recipient of China's National High-Level Young Talent Program and the Shanghai Magnolia Young Talent Program. Dr. Ye has led three national and provincial research projects and holds four authorized Chinese patents and one international patent, which has been licensed and supported by external funding. She also received the MINE Distinguished Young Scientist Award. She currently serves as a Scientific Advisor to Persperity Health and as a Youth Editorial Board Member of The Innovation, Med-X, and Soft Science.

## ABSTRACT

With the deepening of national digital transformation and the "Healthy China" initiative, non-invasive wearable sensing technologies are emerging as a research frontier in the field of health management. Ultra-sensitive wearable sweat analysis platforms that integrate flexible electronics, microfluidics, and electrochemical analysis enable real-time and continuous monitoring of physiological and metabolic signals, offering new opportunities for early disease screening, personalized diagnosis, and proactive health management. Sweat, as a biofluid rich in diverse biomarkers, reflects key physiological parameters such as metabolic status and hormone levels. Its non-invasive and continuously accessible nature makes it especially valuable for the digital and intelligent management of women's health. For instance, fluctuations in female hormone levels are closely associated with fertility, menstrual disorders, and menopause, and are critical for monitoring, intervention, and therapeutic evaluation in conditions such as infertility, polycystic ovary syndrome (PCOS), and menopausal transition [1, 2]. This report focuses on the precise detection of ultra-low concentration biomarkers in sweat, introducing the development of high-performance sweat sensing platforms from the perspectives of molecular recognition mechanisms, microfluidic chip design, and wearable system integration. It systematically reviews recent advances in sensor sensitivity, selectivity, and stability, and highlights strategies to address challenges such as signal interference, miniaturization, and long-term wearability. Furthermore, it explores the promising applications of these platforms in the digital and intelligent management of women's health, particularly in scenarios requiring continuous, real-time hormone monitoring for reproductive health tracking, menstrual cycle analysis, early diagnosis of endocrine disorders, and personalized intervention.





# Dinggang Shen

**School of Biomedical Engineering, ShanghaiTech University**
**Shanghai United Imaging Intelligence Co., Ltd.**

## PRESENTATION TITLE

**Artificial Intelligence in Life-Span Brain Health Study**

## BIOGRAPHY

Dinggang Shen, PhD is a Professor and a Founding Dean with School of Biomedical Engineering, ShanghaiTech University, and also a Co-CEO of United Imaging Intelligence (UII), Shanghai, China. He is a Fellow of IEEE, AIMBE, IAPR, MICCAI, ISMRM, and IAMBE. He was a recipient of the Distinguished Investigator Award from The Academy for Radiological & Biomedical Imaging Research, USA (2019), Technical Achievement Award from IEEE EMBS (2024), and Enduring Impact Award from MICCAI (2025). He was a Jeffrey Houpt Distinguished Investigator and a Full Professor (Tenured) with University of North Carolina at Chapel Hill, USA. He was also a tenure-track assistant professor in University of Pennsylvanian, and an Instructor in Johns Hopkins University. His research interests include medical image analysis and artificial intelligence, in which he published >760 SCI papers, with H-index 169 and 120K+ citations. He serves as Senior Editor for Medical Image Analysis, IEEE TBME, and IEEE TMI, and also editorial board member for six international journals. He has served in the Board of Directors, The Medical Image Computing and Computer Assisted Intervention (MICCAI) Society, in 2012-2015, and was the General Chair for MICCAI 2019.

## ABSTRACT

In this talk, I will introduce our recently-developed AI methods for 1) infant brain development study from 0 to 6 years old, for precise charting of dynamic early brain developmental trajectories in understanding normative and aberrant brain growth, and 2) aging study (over 60 years old), for characterizing normal aging and unnormal aging related to Alzheimer's disease.



# Xiahai Zhuang

**Fudan University**

**PRESENTATION TITLE**

**Interpretable Medical Artificial Intelligence**

## BIOGRAPHY

Xiahai Zhuang is Vice Dean and Professor at the School of Data Science, Fudan University. He is internationally recognized for his work in medical image analysis and artificial intelligence, with research spanning cardiac image computing, multimodal medical image analysis and explainable AI.

Professor Zhuang has made significant contributions to medical imaging, especially in cardiac image analysis and computational methods for clinical imaging applications. He has published over 100 peer-reviewed articles, among which several has been highly recognized with major awards such as the Second Prize of the Shanghai Natural Science Award, the Elsevier-MedIA and MICCAI Best Paper Award, and MICCAI Young Scientist Award. He currently serves as Executive Director & Treasurer, Board of the MICCAI Society and as Associate Editor of numerous top journals including IEEE TPAMI, Medical Image Analysis, and IEEE TMI.

## ABSTRACT

Medical AI has advanced rapidly, yet its clinical adoption remains limited. This talk addresses three fundamental challenges—black-box decision-making, limited generalizability, and concerns about safety and reliability—and presents recent advances in explainable AI for computer-aided diagnosis. First, it explores how clinically relevant features can be represented through concept learning and integrated with model editing, making diagnostic decisions interpretable and open to targeted intervention. Second, it investigates model reasoning through learnable binary logic rules, seeking to uncover new diagnostic patterns consistent with clinical knowledge. Third, it examines explainable mechanisms for generalization by combining rule-based and Bayesian modeling with modular neural network design, thereby enhancing the robustness and transferability of medical image analysis models across clinical centers and imaging modalities.





# Yang Chen

**Southeast University**

**PRESENTATION TITLE**

**面向应用的智能医学成像和处理**

## BIOGRAPHY

陈阳教授围绕医学成像算法和智能影像分析开展科研工作，服务国产高端医疗设备，发表论文一百多篇，是爱思唯尔发布的 2022-2025 年中国高被引学者。目前是东南大学计算机科学与工程学院教授、国家杰出青年科学基金获得者和科技部重点研发专项负责人。

## ABSTRACT

The report centers on intelligent medical imaging and image analysis processing cases tailored to enterprise demands and clinical applications. It elaborates on high-quality medical imaging technologies, the research and development of domestic medical imaging equipment, as well as clinical task-driven medical image processing. Specific contents cover intelligent medical imaging algorithms for diverse application scenarios, equipment deployment of imaging algorithms, and intelligent image processing. Finally, the report also presents reflections on future digital twin technologies and interdisciplinary research integrating medicine and engineering.



# Lei Cui

**Northwestern University**

## PRESENTATION TITLE

**Artificial Intelligence for Digital Pathology: From Algorithmic Innovation to Clinical Translation**

## BIOGRAPHY

Prof. Lei Cui is an Associate Professor at the School of Computer Science, Northwest University, China. He received his Ph.D. through a joint doctoral training program with Northwestern University and the Department of Biomedical Engineering at the University of Florida. His research focuses on artificial intelligence in medicine, particularly computational pathology, medical image analysis, and intelligent diagnostic systems.

He has led multiple research projects supported by the National Natural Science Foundation of China and provincial-level programs. His work has appeared in leading journals and conferences, including Nature Machine Intelligence, IEEE Transactions on Medical Imaging, Medical Image Analysis, Allergy, AAAI, and MICCAI. His research has been recognized by several awards, including the Special Prize for Outstanding Scientific Research Achievement of Higher Education Institutions in Shaanxi Province.

## ABSTRACT

Artificial intelligence (AI) is rapidly reshaping healthcare, and digital pathology has become one of the most promising areas for clinical AI translation. Although major progress has been made in algorithm development, the routine adoption of AI in pathology still faces important challenges, including complex diagnostic workflows, limited high-quality annotations, cross-center variability, and the need for reliable and interpretable decision support.

This presentation introduces recent advances in AI-powered digital pathology, covering the development from conventional deep learning algorithms to pathology foundation models and intelligent clinical systems. It reviews large-scale vision and vision-language models for whole-slide image understanding, multimodal representation learning, and AI-assisted diagnostic support. The talk will also present representative work from the research team, including weakly supervised learning, multi-scale pathology image analysis, interpretable AI, and pathology-specific multimodal foundation models.

Beyond algorithmic research, the presentation emphasizes how pathology AI is moving toward real clinical use. Representative applications include AI-assisted diagnosis, immunohistochemistry and molecular marker analysis, pathology quality control, digital workflow optimization, and intelligent pathology information platforms. These examples illustrate how AI can support pathologists not only in image interpretation, but also in quality assurance, workflow management, and diagnostic standardization. By integrating computer science, pathology, and clinical medicine, AI-driven digital pathology has the potential to improve diagnostic efficiency, consistency, and accessibility, and to accelerate the translation of intelligent systems into cancer diagnosis and precision oncology.



# Yixuan Yuan

**The Chinese University of Hong Kong**

## PRESENTATION TITLE

**AI for Brain Gut Analysis**

## BIOGRAPHY

Prof. Yixuan Yuan is currently an Associate Professor in the Department of Electronic Engineering at The Chinese University of Hong Kong. Her research focuses on AI for brain-gut analysis. She has received the NSFC Young Scientist Scheme Type B project, the Young Scientist Award in Engineering from Hong Kong Institution of Science, the School of Medicine Dean's Fellowship at Stanford University, and the Outstanding Teaching Award. Her publications have received multiple awards, including AAAI Top 1 Most Influential Paper recognition (2025), ICCV Spotlight paper with full marks (2025), ICBIR Best Paper Award (2023), CVPR Best Paper Nomination (2022), MICCAI Young Scientist Award (2022) and the ICMA Best Paper Award (2013). As first or corresponding author, Prof. Yuan has published papers in Nature Biomedical Engineering, npj Digital Medicine, Cell Reports Medicine, IEEE TMI, TPAMI, IJCV, and MedIA, as well as in conferences such as MICCAI, CVPR, ICCV, ECCV, ICLR, and ICRA.

## ABSTRACT

The rapid development of deep learning has brought transformative advances to medical image analysis, significantly improving the accuracy of clinical diagnosis and the efficiency of treatment decision-making. However, the clinical translation of current deep learning methods still faces several key challenges, including insufficient utilization of available data, limited model generalizability and interpretability, and concerns regarding safety, robustness, and reliability in real-world applications.

This seminar will focus on AI for brain-gut analysis. It will first introduce recent advances in data-driven artificial intelligence for medical imaging and discuss emerging methods for addressing these challenges in medical image analysis. The seminar will then explore new opportunities enabled by foundation models for brain-gut imaging analysis, with particular emphasis on clinical applications such as disease assessment and automated medical report generation. Finally, in the era of agentic AI, the seminar will discuss how multi-agent collaboration can support medical image analysis and accelerate research workflows.



# Guibin Bian

**Institute of Automation, Chinese Academy of Sciences**

## PRESENTATION TITLE

**Intelligent Microsurgical Robots**

## BIOGRAPHY

Gui-Bin Bian is a Professor at the Institute of Automation, Chinese Academy of Sciences. His research focuses on intelligent surgical robotics. He has authored over 190 high-quality academic papers, 99 of which are indexed by SCI, and received seven international paper awards. He holds 72 granted domestic and international invention patents and participated in drafting one national standard. His honors include the First Prize of the China Instrument and Control Society's Technological Invention Award, the First Prize of the China Invention Association's Invention & Innovation Award, the "Strengthening-Nation Young Scientist" nomination from the Communist Youth League and China Youth Daily, and the Robot Science Leading Award. He serves on expert panels for the 14th Five-Year National Key R&D Program (Special Projects on "Fundamental Research Infrastructure and Major Scientific Instruments and Equipment Development" and "Intelligent Robotics"), and is a member of the expert working group for the AI domain guideline of the "Strategic Science & Technology Innovation Cooperation" key program. He is President of the Chinese Academy of Sciences Youth Innovation Promotion Association, and an editorial board member of IEEE Transactions on Instrumentation and Measurement (TIM), IEEE Transactions on Automation Science and Engineering (TASE), and The Innovation.

## ABSTRACT

Microscopic surgical robots represent an integrated advancement in precision surgery and intelligent control. They assist surgeons in a variety of microsurgical procedures by enabling highly accurate, dexterous, and standardized operations, and constitute a significant branch of medical surgical robotics. Focusing on microscopic ophthalmic surgery, this lecture reviews the historical development and leading advances in the field, and describes how innovations in surgical microscopes and instruments have catalyzed progress. The next generation of microscopic ophthalmic surgical robots is characterized by greater operational autonomy and flexibility, higher control precision, more comprehensive assistive functions, and improved postoperative feedback. The talk details several key enabling technologies, including the development of intelligent surgical instruments, intraoperative real-time multimodal navigation methods, robotic intelligent control strategies, and automated surgical assessment. The lecture concludes with an outlook on future opportunities and challenges for microscopic ophthalmic surgical robotics.





# Kang Li

**West China Hospital, Sichuan University**

## PRESENTATION TITLE

**Artificial Intelligence in Medicine: Our Journey at West China Hospital**

## BIOGRAPHY

Kang Li received the Ph.D. degree in Mechanical Engineering from University of Illinois at Urbana Champaign, Champaign, IL, USA, in 2009. He is now a full professor of the Biomedical Big Center at West China Hospital and Associate Dean for Research at Sichuan University Pittsburgh Institute (SCUPI). Before joining West China Hospital, He was an associate professor with the Department of Orthopaedics, Rutgers New Jersey Medical School (NJMS) and an assistant professor with Department of Industrial and Systems Engineering, Rutgers University. He was also a graduate faculty member in the Departments of Biomedical Engineering and Computer Science at Rutgers University. He serves as an associate editor of IEEE Transactions on Human-Machine Systems. His research interests include AI in healthcare, healthcare systems engineering, medical imaging, biomechanics, biorobotics, and human factors/ergonomics.

## ABSTRACT

The integration of Artificial Intelligence into healthcare demands more than theoretical breakthroughs; it requires robust validation within the chaotic, high-stakes environments of real-world clinical practice. This talk outlines our comprehensive journey at West China Hospital, illustrating how we bridge the critical gap between algorithmic innovation and frontline medical reality. We will explore our multidisciplinary milestones across three foundational pillars of intelligent medicine: System-Level Clinical Optimization Diagnostic Intelligence & Imaging Embodied AI & Surgical Robotics. Ultimately, this presentation serves as a blueprint for translating deep technological capabilities into systemic hospital transformation, redefining human-machine collaboration, and delivering next-generation care to the patients who need it most.



# Yang Zhao

Peking University

## PRESENTATION TITLE

**数字细胞和组织器官再生重构**

## BIOGRAPHY

赵扬，本科和博士毕业于北京大学生命科学学院，目前任北京大学临床医学高等研究院研究员、博士生导师，北大 - 清华生命科学联合中心、天然药物及仿生药物全国重点实验室及细胞稳态及衰老性重大疾病北京市研究中心研究员；担任国家重点研发计划“合成生物学”重点专项项目负责人；获评“万人计划“青年拔尖人才和自然基金委优青项目。中国细胞生物学会标准工作委员会、中国细胞生物学会细胞与基因治疗分会委员。以第一或通讯作者在 Science、Cell、Cell Stem Cell、Circulation 等杂志发表论文 30 余篇，相关成果曾获评“中国科学年度十大进展”等。

## ABSTRACT

细胞重编程和多能干细胞（PSC）分化技术为药物发现、疾病建模和再生医学提供了前景广阔的解决方案。然而，再生医学的新发展仍然需要更为系统的方法鉴定细胞命运决定因子及其组合，并对细胞命运进行定量精准操控。本次报告将介绍 2 个方向的研究内容：(1) 通过结合活细胞明场成像的视频流数据与机器学习动态识别并解读多能干细胞分化过程中的细胞状态，实现对人 iPSC 分化全过程的实时细胞识别和“智能”监控。(2) 基于 DRUG-seq2/PHDs-seq 等药物扰动转录图谱构建技术，绘制细胞命运扰动图谱，鉴定调控细胞命运转化的小分子化合物。



# Jianjiang Feng

Tsinghua University

## PRESENTATION TITLE

**Hand Perception and Interaction**

## BIOGRAPHY

His research interests cover biometric recognition, human-computer interaction, and medical image analysis. He has presided over key national R&D projects funded by the Ministry of Science and Technology, the Excellent Young Scientists Fund of the National Natural Science Foundation of China, and other research programs. He serves as an Editorial Board Member of IEEE Transactions on Information Forensics and Security (T-IFS) and IEEE Transactions on Biomedical Engineering (T-BIOM). He acted as Program Chair of the Chinese Conference on Biometric Recognition (2015–2021), and Area Chair of the International Conference on Biometrics (2014–2016, 2021, 2025). He has published more than 50 journal papers in IEEE and ACM transactions, and co-authored the 3rd edition of Handbook of Fingerprint Recognition published by Springer. His research awards include the Second-Class National Technical Invention Award (2018), First-Class Award of the China Institute of Electronics Science and Technology (2011), First-Class Public Security Science and Technology Progress Award (2024), First-Class Zhejiang Provincial Natural Science Award (2022), two Second-Class Ministry of Education Natural Science Awards (2011, 2015), and the Silver Award of China Invention Patent (2019). He has won six Best Paper Awards or Best Paper Nominations at international conferences.

## ABSTRACT

The human hand is the most dexterous manipulative organ of the human body and serves as the core interaction medium for all types of computing devices. Input peripherals including computer keyboards and mice, smartphone touchscreens, and VR controllers all rely on hand movements to realize human-computer input. Nevertheless, existing hand interaction technologies suffer from numerous drawbacks that severely undermine user operational experience and interaction efficiency. For instance, multi-touch technology only captures the coordinate information of finger contact points and fails to acquire full hand states; VR interaction, on the other hand, is plagued by insufficient tracking precision and rapid operator fatigue. Against this backdrop, this paper elaborates on our team’s research explorations and technical practices in the fields of hand state perception and novel human-computer interaction.



# Qi Liu

**Tongji University**

## PRESENTATION TITLE

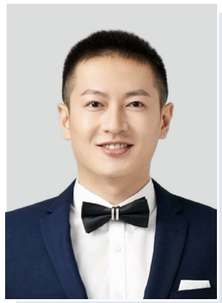
**From Language Harmonization to World Model: The Two Tales of Building AIVC**

## BIOGRAPHY

Qi Liu is a Tenured Distinguished Professor of Tongji University, China; PI at Shanghai Institute of Autonomous Intelligent Unmanned Systems. He has long been committed to developing AI-enabled omics analysis and precise medicine. He has published a series of research papers in top-tier journals including Nature Methods, Nature Machine Intelligence, and Nature Computational Science et c.

## ABSTRACT

This report focuses on the two core fundamental elements of digital cell computing construction from the perspective of AI, namely Representation Learning and Dynamic Modeling. It will systematically elaborate the relevant research and development work conducted by our team on the architecture of digital cell computing centered on these two elements, and highlight the two recently released AIVC platforms: CellHermes and AlphaCell. Specifically, CellHermes achieves multi-dimensional integrated representation with the language model as a bridge, while AlphaCell implements dynamic modeling based on a well-constructed Virtual Cell World Model. The two platforms respectively explore the generalizable computing methodology and technical implementation paths for AIVC from the corresponding dimensions.



# Jia You

**Fudan University**

## PRESENTATION TITLE

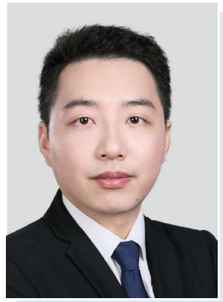
**生物医学大数据和人工智能驱动的精准医学研究**

## BIOGRAPHY

Dr. You Jia, is a Young Principal Investigator at the Institute of Science and Technology for Brain-Inspired Intelligence (ISTBI) at Fudan University. Dr. You obtained his PhD in Statistics from the University of Hong Kong in 2020. He is mainly engaged in interdisciplinary research related to machine learning and biological/clinical medicine, especially the intelligent diagnosis and prediction of brain diseases using multi-scale and multi-omics biomedical big data. Over the past five years, Dr. You has published more than 20 papers as first author (including co-first author) in high-impact international journals such as Cell (2025), Nature Metabolism (2025), Nature Aging (2024/2025), Nature Mental Health (2026) and Nature Human Behaviour (2024a/2024b/2025). Dr. You has been recognized with the Shanghai Science and Technology 35U35 Award, the Shanghai Pujiang Talent, the Xiaomi Young Scholar, and the Qiyuan Young Scholar.

## ABSTRACT

The accelerating aging of the population, coupled with the high prevalence of major chronic diseases, has become a critical public health issue that threatens residents' health and exacerbates the healthcare burden. Artificial intelligence offers significant advantages in understanding complex information, integrating multimodal data, and reasoning with medical knowledge. It can extract key health- and disease-related information from heterogeneous, multi-source data, including electronic health records, biochemical tests, medical imaging, and behavioral exposures, providing a new breakthrough for precision medicine in major diseases. This report will introduce our research group's prior work on early risk prediction, precise diagnosis, and personalized intervention for major brain diseases such as Alzheimer's disease, leveraging artificial intelligence and biomedical big data. Furthermore, we will elaborate on our current exploratory applications involving cross-scale, multi-omics data.



# Wei Shen

Shanghai Jiao Tong University

## PRESENTATION TITLE

### 3D Reconstruction and Simulation of Deformable Tissues in Surgical Scenes

## BIOGRAPHY

Wei Shen is a professor at the Institute of Artificial Intelligence, Shanghai Jiao Tong University. He received NSFC Excellent Young Scientists Fund. He has over 100 peer-reviewed publications in computer vision and machine learning related areas, including IEEE Trans. PAMI, IJCV, IEEE Trans. Medical Imaging, NeurIPS, ICML, ICCV, CVPR, etc. He served as an Area Chair for multiple top-tier international conferences, such as ICCV, CVPR, NeurIPS and ICML. He is an Associate Editor for Pattern Recognition and SCIENCE CHINA Information Sciences. He received the MICCAI Young Scientist Award in 2023 and CSIG Young Scientist Award in 2025.

## ABSTRACT

Reconstructing the dynamic 3DI structure of tissues from surgical videos and constructing a simulation environment can help surgical medical students understand the surgical process and improve their training efficiency. This talk will focus on the theme of 3D reconstruction and simulation of deformable tissues in surgical scenes, and introduce a series of progress made by our team in tasks such as endoscopic video depth estimation, 3D reconstruction of human tissues, and simulation of deformable tissues.





# Dongxin Zhao

Shanghai Institute of Materia Medica, Chinese Academy of Sciences

## PRESENTATION TITLE

### Building Scalable Perturbation Platforms for AI-Driven Drug Discovery

## BIOGRAPHY

Dongxin Zhao is a Principal Investigator and Professor at the Shanghai Institute of Materia Medica, Chinese Academy of Sciences. She received her B.S. and Ph.D. degrees from the School of Life Sciences at Peking University, where she completed her doctoral training in the laboratory of Prof. Hongkui Deng. She subsequently conducted postdoctoral research in the laboratory of Prof. Prashant Mali at the University of California, San Diego. Prior to joining the Shanghai Institute of Materia Medica, she served as a Principal Scientist in the Oncology Research and Development Division at Pfizer Inc., where she developed innovative functional genomics approaches for cancer drug target discovery.

## ABSTRACT

Artificial intelligence is transforming drug discovery, but its predictive power ultimately depends on the availability of large-scale, high-quality perturbation data that systematically link genetic and chemical interventions to cellular phenotypes. Scalable perturbation platforms capable of generating such AI-ready datasets are therefore becoming a critical foundation for next-generation drug discovery.

To address this need, we developed complementary genetic and chemical perturbation platforms that enable systematic profiling of cellular responses across diverse biological contexts. Leveraging recent advances in combinatorial indexing single-cell sequencing, multiplexed cell tagging, and treatment hashing, we constructed a single-cell chemical perturbation atlas comprising over two million transcriptomes from 15 liver cancer cell lines treated with 90 preclinical and clinical-stage compounds across multiple concentrations. Integration with pooled viability assays enabled parallel quantification of both transcriptional and phenotypic responses, providing a comprehensive resource for characterizing drug activity and mechanism of action. In parallel, we established a prime editing-based saturation genome editing platform to systematically quantify the effects of individual amino acid substitutions on drug response at single-residue resolution, generating high-resolution genotype–phenotype maps for functional variant interpretation.

Together, these complementary platforms generate scalable, multimodal perturbation datasets that capture context-dependent cellular responses to both genetic and chemical perturbations. By integrating high-throughput perturbation technologies with AI, this framework establishes a foundation for training predictive models of cellular behavior, enabling context-aware target discovery, mechanism inference, and therapeutic prediction. More broadly, it provides a scalable data-generation paradigm that bridges experimental biology and artificial intelligence, accelerating the development of next-generation, data-driven drug discovery.



# X. Edward Guo

**Columbia University**

**PRESENTATION TITLE**

**Subcondral Bone in Human Osteoarthritis**

## BIOGRAPHY

Dr. X. Edward Guo is the Stanley Dicker Professor of Biomedical Engineering and Professor of Medical Sciences (in Medicine) at Columbia University. He directs the Bone Bioengineering Laboratory in the Department of Biomedical Engineering at Columbia, focusing his research on the micromechanics of bone tissue, computational biomechanics, and the mechanobiology of bone. His past honors include the Young Investigator Recognition Award from the Orthopaedic Research Society, the National Research Service Award from the NIH, a CAREER award from the NSF, Funds for Talented Professionals (Joint Research Fund for Overseas Chinese Young Scholars) from the NSFC, Christopher R Jacobs Award from BMES, and the Adele Boskey Award from ASBMR. He was elected a fellow of the AIMBE, ASMR, BMES, ASBMR, ICORS, IAMBE, and ORS. He served as President of the ICMRS and the Chair of the Department of Biomedical Engineering at Columbia University from 2017 to 2023. He also recently founded the Northeast BME League and served as its inaugural President.

## ABSTRACT

Subchondral bone is increasingly recognized as a key driver in the initiation and progression of primary osteoarthritis (OA). This talk highlights advances in understanding how alterations in subchondral bone microarchitecture and mechanics contribute to disease development independent of overt injury. Using high-resolution imaging techniques, including second-generation HR-pQCT and MRI, combined with Individual Trabecula Segmentation (ITS) and micro–finite element analysis, we characterize changes in trabecular plate–rod morphology, bone mineral density, and mechanical properties in human OA. Early-stage primary OA is associated with selective loss of trabecular rods, compensatory thickening of trabecular plates, and increased heterogeneity in tissue mineralization, alongside changes in subchondral plate thickness and porosity. These adaptations alter load transmission across the osteochondral unit, disrupting the mechanical and biological balance between bone and cartilage. The resulting changes in stress distribution and mechanobiological signaling contribute to progressive cartilage degeneration. By integrating structural and functional metrics, this work provides new insights into bone–cartilage crosstalk in primary OA and identifies subchondral bone as a promising target for early diagnosis and therapeutic intervention.





# Peter Yingxiao Wang

**University of Southern California**

**PRESENTATION TITLE**

**Live Cell Imaging and Sonogenetics for Cell Therapy**

## BIOGRAPHY

Dr. Peter Yingxiao Wang, Department Chair, Dwight C. and Hildagarde E. Baum Professor, Alfred E. Mann Dept. of Biomedical Engineering, University of Southern California (USC), Los Angeles, USA; Email: ywang283@usc.edu; Phone: 217-898-2810

Dr. Wang obtained his bachelor's and master's degrees in Mechanics and Fluid Mechanics from Peking University, Beijing, P.R. China, in 1992 and 1996, respectively. He received his Ph.D. degree in Bioengineering from the University of California, San Diego Jacobs School of Engineering in 2002 and continued his postdoctoral work at UC San Diego working under Bioengineering Professor Shu Chien and Professor Roger Y. Tsien in the Department of Pharmacology. He is current the department chair and a professor in the department of Biomedical Engineering at USC and a fellow of American Institute of Medical and Biological Engineering (AIMBE), International Academy of Medical and Biological Engineering (IAMBE), and Biomedical Engineering Society (BMES). Before joining the USC in 2023, he was a faculty of Bioengineering at the University of Illinois, Urbana-Champaign (UIUC), and University of California, San Diego (UCSD). Dr. Wang is the recipient of the Wallace H. Coulter Early Career Award (both Phase I and Phase II), the National Science Foundation CAREER Award, and National Institutes of Health Independent Scientist Award. His research is on cellular and molecular engineering for live cell imaging and controllable cell-based therapy. His lab is supported by the National Institutes of Health, National Science Foundation, and private foundations.

## ABSTRACT

Cell-based cancer immunotherapy is quickly emerging as a promising therapeutic intervention for cancer treatment. However, non-specific killing against healthy tissues (e.g. on-target/off-tumor effect) is a major hurdle for solid tumor treatment. Here we show that the genetics and cellular functions of chimaeric antigen receptor T cells (CAR-T cells) within tumors can be remotely controlled by focused ultrasound (FUS) via a CAR cassette under a controllable promoter. In mice with subcutaneous tumors, locally injected T cells with the inducible CAR and activated via FUS guided by magnetic resonance imaging (MRI) mitigated on-target off-tumor activity and enhanced the suppression of tumor growth, compared with the performance of standard constitutive CAR-T cells. We have also developed controllable on-switch gene cassettes to reprogram the target cancer cell by FUS. Viral vectors were used to deliver the gene cassettes into the tumor cells, which will be activated by FUS and then targeted by CAR T for cancer immunotherapy. We applied this system to successfully treat prostate cancer cells whose locally metastasized tumors are confined in space but intermingled with vessels and nerves, with surgery or radiation therapy targeting the whole prostate gland potentially having adverse urinary and sexual effects on the patients. This local activation of engineered cells by FUS should allow a high precision and safety in eradicating tumors. Recently, we have also integrated FUS and CRISPR technologies to remotely guide the focused genomic editing and regulations in vivo. Hence, this approach for immunotherapy should open new opportunities to integrate engineering physics with genetic medicine and lead to successful translation from fundamental science and engineering to cancer therapy and clinical applications.



# Jeff Tza-Huei Wang

**Johns Hopkins University**

## PRESENTATION TITLE

**Precision Diagnostics Anywhere: Digital Partitioning, Melt Coding, and Magnetofluidic Automation – From Infection/AMR to Epigenetic Cancer Detection**

## BIOGRAPHY

Tza-Huei (Jeff) Wang is the Louis M. Sardella Professor of Mechanical Engineering and Biomedical Engineering at Johns Hopkins University, where he has been a faculty member since 2002. He received his Ph.D. in Mechanical Engineering from UCLA. Dr. Wang's research focuses on developing micro- and nano-biotechnologies for molecular analysis and biomedical diagnostics, with an emphasis on technologies that are sensitive, specific, affordable, and accessible. His group has pioneered microfluidic point-of-care platforms for rapid infectious disease diagnostics and antimicrobial susceptibility testing, enabling pathogen identification and resistance profiling near the patient. He has also developed highly sensitive and cost-effective molecular detection strategies, including digital high-resolution melt analysis, for detecting rare genetic and epigenetic biomarkers relevant to cancer detection and disease monitoring. Dr. Wang has published more than 200 peer-reviewed journal articles, delivered over 150 invited talks, and holds 27 U.S. and 12 international patents. His research has contributed to four spin-off companies, including Circulomics, which was acquired by Pacific Biosciences. He is a Fellow of AAAS, AIMBE, ASME, IEEE, RSC, and IAMBE.

## ABSTRACT

Precision medicine depends on molecular measurements that are sensitive, multiplexed, and actionable on the timescale of clinical decision-making. Yet many genetic and epigenetic assays remain too slow, costly, or infrastructure-dependent to be used routinely at the point of care or in low-resource settings. In this talk, I will present micro/nano-enabled diagnostic systems that convert complex molecular assays into portable, affordable, sample-to-answer workflows.

The core strategy integrates three complementary elements: (i) digital partitioning in microfluidic arrays and droplets to detect rare targets, achieve single-molecule/single-cell sensitivity, and resolve biological heterogeneity; (ii) melt-coded sensing as an information-rich transducer that enables compact multiplexing with simplified optical hardware; and (iii) magnetofluidic automation using magnetic beads to integrate nucleic acid extraction, washing, and amplification/detection in low-cost cartridges with portable instrumentation.

I will highlight applications spanning two time-critical clinical needs: rapid pathogen identification with antimicrobial resistance testing to guide evidence-based therapy, and high-precision DNA methylation analysis for early cancer detection from scarce circulating DNA. Together, these examples illustrate how digitization, melt coding, and cartridge automation can help democratize precision diagnostics by bringing actionable molecular results closer to patients.





# Ning Wang

**Northeastern University**

## PRESENTATION TITLE

**The interplay between mechanomemory and mechanohomeostasis in living cells**

## BIOGRAPHY

Ning Wang is the Founding Director of Institute for Mechanobiology at Northeastern University in Boston and Professor of Bioengineering in Department of Bioengineering, College of Engineering, Northeastern University. Wang was Leonard C and Mary Lou Hoeft Endowed Professor in Engineering from 2014 to 2023 and Professor from 2006 to 2023 at University of Illinois at Urbana-Champaign. Prior to that, Wang was on the faculty at Harvard-Chan School of Public Health (HCSPH) from 1994 to 2006 and a research fellow/associate at HCSPH and Harvard Medical School/Children's Hospital from 1990 to 1994. Dr. Wang received Doctor of Science degree in Physiology from Harvard University in 1990.

In early 1990s, Wang and Ingber discovered integrins are mechanosensors using the Magnetic Twisting Cytometry (MTC) technology that he and colleagues invented. Wang's lab developed 3D-MTC and the 3D in-vivo traction and modulus dual probes. Together with atomic force microscopy and laser tweezers, MTC technology is one of the three cell mechanics tools used worldwide. Wang was the first to provide experimental evidence that endogenous pre-stress regulates cell stiffness in early 2000s and controls gene expression. Wang's lab discovered the fundamental differences between force-based signaling and soluble growth factor-based signaling. Wang's lab developed a novel mechanical method using soft fibrin gels that selects and isolates a small subpopulation of malignant tumor cells, independent of surface stem-cell markers, that drive metastasis. Wang and colleagues synthesized a rigidified small molecule retinoid (WYC-209) that efficiently inhibits malignant drug-resistant tumor metastasis with little toxicity. Wang proposed the tumor cell softness model in cancer progression that has been supported by findings from numerous labs around the worlds. Wang's lab discovered that rapid gene expression is directly upregulated by stretching chromatin via forces on cell surface to integrins without cytoplasmic biochemical cascades His lab recently discovered direct chromatin stretching-dependent mechanomemory in nucleoplasm.

## ABSTRACT

It is well-established that mechanical stimulation play critical roles in functions of cells and tissues in physiology and diseases. However, how do cells transduce mechanical signals into biochemical signals and biological responses, i.e., mechanotransduction, remains incompletely understood. A decade ago we presented experimental evidence of direct chromatin-stretch induced rapid gene transcription in living cells1, complementing the slow and indirect signaling pathways of mechanotransduction. Recently we discovered nuclear mechanomemory (the persistent response of a biological system after cessation of mechanical perturbation) that was dependent on chromatin stretching2, 3. Recently we have identified and proposed cytoskeletal prestress homeostasis as a third fundamental principle conserved across all living species4, in addition to the two well-established biological principles of the Central Dogma that governs the flow of genetic information and of the Metabolism that dictates the flow of energy in biological systems. In this talk we discuss the interplay between mechanotransduction, mechanomemory and prestress homeostasis in living cells and organisms. Understanding the relationships between these critical processes may uncover novel insights into development, physiology and pathology and identify new mechanical-targeted strategies that will address the most challenging unmet clinical needs in medicine to advance mechanohealth.

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# Zong-Ming Li

**University of Arizona**


**PRESENTATION TITLE**

## Median Nerve Decompression by Carpal Arch Space Augmentation

## BIOGRAPHY

Zong-Ming Li, PhD, is currently Chair Professor and Dean of Faculty of Biomedical Engineering, Shenzhen University of Advanced Technology. Prior to join the current position in 2026, he was the William and Sylvia Rubin Chair of Orthopedic Research and Professor of Orthopedic Surgery and Biomedical Engineering at the University of Arizona. With more than 35 years of research in musculoskeletal biomechanics, Dr. Li's work has not only advanced scientific understanding but also informed clinical applications that improve patient outcomes. He is the recipient of the ASME Savio L-Y. Woo Translational Biomechanics Medal, recognizing his contribution to the field. Dr. Li has been recognized as a fellow of several leading science and engineering organizations, including American Institute for Medical and Biological Engineering (AIMBE), American Society of Mechanical Engineers (ASME), American Society of Biomechanics (ASB), Institute of Electrical and Electronics Engineers (IEEE), International Academy of Medical and Biological Engineering (IAMBE), International Combined Orthopaedic Research Societies (ICORS), International Academy of Artificial Intelligence Sciences (AAIS), International Society of Biomechanics (ISB), and Orthopaedic Research Society (ORS).

## ABSTRACT

The median nerve, bounded in the carpal tunnel, is prone to abnormal compression, leading to clinical symptoms of carpal tunnel syndrome. Carpal tunnel release surgery transects the transverse carpal ligament to expand the tunnel arch space, decompress the median nerve, and relieve the associated symptoms. However, the surgical procedure unavoidably disrupts essential anatomical, biomechanical and physiological functions of the wrist, potentially causing reduced grip strength, pillar pain, carpal bone instability, scar tissue formation, and perineural fibrosis. It is desirable to decompress the median nerve without surgically transecting the transverse carpal ligament. This talk is to review several approaches we have developed for nonsurgical carpal arch space augmentation, namely, radioulnar wrist compression, muscle-ligament interaction, palmar pulling, and collagenolysis of the transverse carpal ligament. I will summarize our work about theoretical considerations, in vitro and in situ experiment, computational modeling, tissue engineering approach, and human subject studies with asymptomatic and carpal tunnel syndrome hands.






# Yang Song

**West China Medical Center**


**PRESENTATION TITLE**

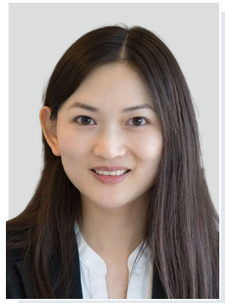
## Overcoming Cellular Mechano-Adaptation with Curved Material Interfaces

## BIOGRAPHY

Yang Song is a Professor at the West China Medical Center, Sichuan University. He finished his research training the University of California, Los Angeles (UCLA). He is also a co-founder of Sparkgene Biotechnology and serves as a Young Committee Member of the International Chinese Musculoskeletal Research Society. His research focuses on integrating biomechanics, mechanobiology, and epigenetic engineering to understand and manipulate cellular identity and aging memory. By developing multidimensional mechanical approaches, his group aims to enable accessible and personalized healthcare through advances in tissue regeneration, cell-based therapies, and therapeutic discovery. In recent years, Prof. Song has published more than 30 peer-reviewed research articles, including Nature Materials (2021, 2022, 2024), Science Advances (2024, 2025), Nature Communications (2022, 2025), Advanced Science (2021, 2023), and Chemical Society Reviews (2025).

## ABSTRACT

Cells rapidly adapt to external mechanical cues, which often limits the persistence and efficacy of material-based mechanopriming strategies for cell fate control. To address this challenge, we developed a polydimethylsiloxane (PDMS) microcurvature array that imposes a sustained geometric boundary condition, preventing cells from reaching mechanical equilibrium and thereby maintaining a prolonged non-adapted state for at least 72 h. Using time-resolved live-cell imaging, mechanical analyses, epigenetic profiling and targeted perturbation experiments, we uncovered a stage-gated mechano-epigenetic cascade through which persistent curvature progressively remodels cell state. In this process, curvature first enhances cellular contractility, followed by reorganization of the actin cytoskeleton and subsequent changes in nuclear mechanics. These mechanically coupled events sequentially regulate distinct chromatin-associated marks over a three-day period, including H3K4me3, histone H3 acetylation and H3K9me3, indicating that sustained geometric confinement is translated into temporally ordered epigenetic reprogramming. This time-integrated remodeling substantially increases global chromatin accessibility and markedly improves fate conversion efficiency, elevating fibroblast-to-neuron reprogramming from approximately 3% to over 50%, while also enhancing induced pluripotent stem cell reprogramming. Importantly, when the geometric boundary condition is removed by returning cells to a flat substrate, mechano-adaptation is re-established and the priming effect is lost, directly demonstrating that persistent mechanical disequilibrium is required to maintain the permissive epigenetic state. To explore the translational utility of this platform, we further integrated the curvature array with a pilot high-throughput small-molecule screen and identified Butein as a candidate neuroprotective compound, highlighting the broader potential of this system as a functional discovery platform. Collectively, our findings establish persistent geometric programming as a materials-based design principle for bypassing mechano-adaptation, enabling durable epigenetic priming and more efficient cell fate engineering. This work provides a conceptual and technological framework for leveraging sustained mechanical disequilibrium in regenerative medicine, reprogramming biology and mechano-medicine.



# Lingyan Shi

University of California, San Diego

## PRESENTATION TITLE

**Watching the Chemistry of Life Unfold**

## BIOGRAPHY

Lingyan Shi is a tenured Associate Professor of Bioengineering at UC San Diego, where her lab invented new microscopes that reveal the chemistry of life inside living tissue. She discovered the “Golden Window” (1550–1870 nm) — a band of light that can see unusually deep into tissue. She further pioneered DO-SRS, an imaging method that uses tagged water and nutrients to watch cells build brand-new molecules in real time, and developed a family of techniques (A-PoD, PRM, and SuMMIT-SRS) that push this imaging technique to super-resolution and let it track many molecules at once.

Dr. Shi holds 10 awarded and 18 pending patents. Her honors include the Blavatnik Regional Award for Young Scientists (2018), the Hellman Fellowship (2021), Scialog Fellowships in Advancing Bioimaging from RCSA and the Chan Zuckerberg Initiative (2021–2023), and the Sloan Research Fellowship in Chemistry (2023). She received the Cellular and Molecular Bioengineering Rising Star Award (2024), the IUPS Young Faculty Award (2024), and the Emerging Leader in Molecular Spectroscopy Award (2025), and was elected to the National Academy of Inventors in 2025.

## ABSTRACT

Every living thing runs on metabolism — the constant chemical activity that builds, powers, and repairs our cells. When that activity goes off the rails, the result can be aging or disease. Yet it is extremely difficult to watch the dynamics of metabolism happening inside living tissues. Most methods cannot show us where the reactions take place, does not work in living cells, or cannot follow more than one thing at a time.

My lab has built a novel microscope to solve these problems. It combines several advanced imaging techniques into a single platform which we call multimodal metabolic nanoscopy. The idea is simple at heart: we feed cells harmless, “tagged” versions of everyday nutrients — water, carbohydrates, amino acids, and fats — that carry a subtle chemical marker. As the cells use those nutrients to construct brand-new molecules, our microscope can literally watch the new material appears, at a scale finer than a single cell, without harming the living tissue.

This allows us to see the dynamics if biology as it happens. For example, we have found that in developing, aging, and Alzheimer’s-affected brains, certain stresses cause the supporting cells in the brain to pile up abnormal fat droplets. By simultaneous tagging multiple nutrients at once, we can also map how different building programs work together and trace the amino-acid pathways right where they occur in cancer models, fruit-fly tissues, human kidney, lung, lymph node, and fallopian-tube, aged human neurons, and mouse livers.  In each case, we can reveal how specific cell types rewire their chemistry. Together, these tools offer a precise, non-invasive way to discover how the dynamics of metabolism drive health, aging, and disease, and to uncover new biomarkers that could provide new ways to guide diagnosis and treatment.





# Xiao Chen

Zhejiang University

## PRESENTATION TITLE

**Targeting the Coupling of Type H-like Blood Vessels and Cell Fate Transition to Delay Soft Tissue Aging**

## BIOGRAPHY

陈晓，浙江大学医学院教授，浙大医学院附属第二医院双聘教授，运动医学专业博士生导师，国家基金委优秀青年基金、浙江省杰出青年基金获得者。聚焦肌腱纤维化与再生，以成熟胶原为目标，建立肌腱分化与抗纤维化新理念，取得肌腱再生成果：1）率先将正常胶原形成分为早期与成熟双阶段，鉴定 CD271+SCX+ 等关键干细胞亚群，阐明 Ngf-Shp2 轴等胶原成熟核心机制；2）促肌腱分化制剂：研发抑制病理纤维化的肌腱分化体系，实现 GMP 级肌腱细胞规模化制备与临床再生研究备案。3）促腱骨分化支架发现 33% 矿化的胶原诱导 Gli+ 干细胞向腱骨分化，大动物腱骨的纤维软骨再生率从 0 升至 82% 以上。以上成果在 Science Translationl Medicine，Science Advances, Cell Reports, Nature Communications 等主流期刊发表肌腱再生文章 110 余篇 ( 第一和通讯作者 50 余篇 .SCI 他引 5500 余次 ,H 指数 43)，并完成专利转让。研究成果多次在国际肌腱韧带年会，国际软骨修复学会年会获得最佳论文奖。获得浙江省自然科学奖一等奖等多项省部级奖项。担任中国生物医学工程学会组织工程与再生医学分会副主任委员等。

## ABSTRACT

The aging process exhibits tissue-specific characteristics, yet its underlying mechanisms remain poorly understood. While it is widely accepted that a reduction in blood vessels in hard tissues contributes to aging, such as in osteoporosis, the vascular changes driving soft tissue aging and degeneration remain unclear. Here, by integrating single-cell transcriptomics and light-sheet imaging, we uncover a striking infiltration of type H-like blood vessels and an aging-specific Coch+ cell subpopulation in aging soft tissues. In a tamoxifen-induced type H-like blood vessel proliferation mouse model, type H-like blood vessel expansion correlates with impaired locomotor function and accelerated senescence in soft tissues. Following infiltration, type H-like blood vessels secrete CXCL12, driving aberrant differentiation of stem/progenitor cells. Furthermore, Coch+ cell subpopulation promotes type H-like blood vessel invasion via ANG2/VEGF-A signaling. Notably, reducing type H-like blood vessels or inhibiting ANG2/VEGF-A in aging mice, we observed delayed soft tissues aging and improved locomotor function. These findings reveal an underlying mechanism linking vascular infiltration and pathological cell fate transitions in soft tissue aging, highlighting the therapeutic potential of targeting the coupling of type H-like blood vessels and cell fate transition to delay soft tissue aging.




# Min Lin

**Xi'an Jiaotong University**


## PRESENTATION TITLE

**Metastatic Lymph Node Stiffness Primes T Cell Activation Through a Mechanotransduction Axis Suppressed by PD-1**

## BIOGRAPHY

He is a Professor and Associate Dean at Xi'an Jiaotong University, and a recipient of the National Excellent Young Scientist Fund. His research centres on cell biomechanics, with a focus on mechanobiological mechanisms of adhesion-mediated cellular regulation. He has published over 100 papers (68 as first/corresponding author) in high profile journals, including Nature Reviews Physics, Nature Materials, Nature Communications, and Science Advances, with >7,600 citations and an h-index of 42. He has received the Second Prize of the National Natural Science Award and the First Prize of the Ministry of Education Natural Science Award. He serves on several editorial boards and has delivered many invited talks and chaired sessions at major conferences.

## ABSTRACT


Background & Objective:
T cell activation is governed by antigen receptor signaling and mechanical cues from the tissue microenvironment. During metastasis, lymph nodes (LNs) become markedly stiffer, raising the possibility that metastatic LNs mechanically prime anti-tumor T cells. However, the pathway linking LN stiffness to T cell activation remains unclear. Moreover, although PD-1 suppresses T cell immunity, whether it inhibits this same mechanical activation pathway is unknown. Here, we investigated whether T cell activation is controlled by a shared cytoskeleton-to-nucleus mechanotransduction axis that is enhanced by integrin-mediated stiffness sensing and suppressed by PD-1 engagement.

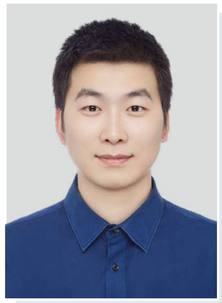
Methods:
We engineered PEG-based hydrogels with independently tunable stiffness and ligand presentation. LN-mimetic gels spanning 1–40 kPa were functionalized with RGD and anti-CD3 to decouple ECM–integrin and TCR signals, whereas PD-1-mimetic gels of 0.6–6 kPa presented anti-CD3 with immobilized anti-PD-1. We combined traction force microscopy, confocal imaging, nuclear morphometry, qRT-PCR, ELISA, siRNA knockdown, pharmacological perturbation, mathematical modeling, clinical analysis of lung cancer patients, and ex vivo LN characterization.

Results:
Patients with LN metastasis showed better immunotherapy responses, and metastatic LNs exhibited an approximately threefold stiffness increase with enhanced CD8+ T cell activation. In vitro, T cells sensed matrix stiffness only in the presence of RGD/integrin ligation. Stiff matrices promoted F-actin aggregation rather than myosin-driven contractility, generating vertical cytoskeletal forces that induced nuclear deformation, YAP nuclear translocation, IL-2 expression, and T cell activation. Mathematical modeling confirmed that actin-polymerization-derived vertical forces efficiently deform the nucleus. After defining this stiffness-induced actin–nucleus pathway, we found that PD-1 engagement suppressed it by promoting cofilin dephosphorylation, disrupting actin polymerization, reducing traction forces, preventing nuclear deformation, and impairing YAP/NFAT1 nuclear translocation, thereby reducing cytokine production and cytotoxicity. Restoring actin polymerization or nuclear transport rescued YAP/NFAT1 localization and partially restored T cell function.

Conclusion:
These findings establish a unified mechanical framework in which metastatic LN stiffness activates T cells through an integrin–F-actin–nucleus–YAP axis, whereas PD-1 acts as a mechanical checkpoint that suppresses this same pathway. This mechanism suggests that restoring cytoskeletal force transmission may complement immune checkpoint blockade.


Keywords: T cell mechanotransduction; immune checkpoint; nuclear deformation; integrin; YAP/NFAT1






# Yu Du

**Institute of Mechanics, Chinese Academy of Sciences**


## PRESENTATION TITLE

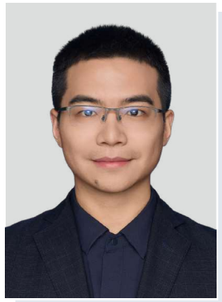
**Study mechenical regulation of cholestatic liver diseases with microphysiological systems**

## BIOGRAPHY

Yu Du is a Professor at the Institute of Mechanics, Chinese Academy of Sciences. His research focuses on organ-on-a-chip technology to construct in vitro models with controllable mechanical microenvironments, particularly investigating the regulatory roles of mechanical forces in liver function. By developing liver chips with tunable structural and mechanical properties, he recreates hepatic physiological microenvironments to elucidate mechanoregulatory mechanisms in liver pathophysiology and explore novel therapeutic strategies.

## ABSTRACT


To address the lack of physiologically relevant liver models, we developed a series of microphysiological systems that recapitulate multi-cellular architecture, tissue–tissue interfaces, and biomechanical cues—including sinusoid, bile duct, and vascularized ductal organoid chips. These platforms enable dissection of how mechanical forces, such as fluid shear and matrix stiffness modulate hepatic homeostasis, immune responses, and biliary injury. Focusing on fibrotic remodeling, we further integrated cholangiocyte organoids with fibroblasts in a confined microtissue that mimics fibrotic bridges. Real-time force monitoring and finite-element simulation revealed that normal ductal structures experience tensile stress, whereas fibrotic matrix contraction that driven by ROCK/myosin activity converts the mechanical state to dominant compression. This compressive loading, together with matrix stiffening, directly promotes cholangiocyte proliferation and ductular reaction. Our results unify the roles of active contraction and passive hardening in fibrosis, demonstrating that tissue-scale mechanical remodeling, especially compression, is a key driver of ductular pathology. These findings provide new mechanobiological insights and therapeutic targets for cholestatic liver diseases.



# Junwei Chen

**Huazhong University of Science and Technology**

## PRESENTATION TITLE

**Mechanism of mechanical force upregulating gene expression and its application in mechanomedicine**

## BIOGRAPHY

Dr. Junwei Chen is a Professor at College of Life Science and Technology in Huazhong University of Science and Technology. He serves as the Associate Chair of the Department of Biomedical Engineering, and supported by National Science Fund for Excellent Young Scholars. The primary research focus on the fields of mechanobiology and mechanomedicine, concentrating on elucidating the mechanisms of mechanical force activating gene expression and the mechanism of force regulate tumor cell and valve disease and exploring mechanical intervention strategies. He has published over 20 SCI-indexed papers in journals such as Science Advances and Nature Communications, with a total citation more than 2,300. Additionally, he has applied and been granted 7 invention patents on antitumor drugs. He serves as a Youth Committee Member of the Biomechanics Committee at the Chinese Society of Theoretical and Applied Mechanics and Chinese Society of Biomedical Engineering, Committee Member of the Mechanobiology Committee at the Chinese Society of Biophysics as well as Deputy Secretary-General of the Materials Biomechanics Branch at the Chinese Society for Biomaterials.

## ABSTRACT

Mechanical signals and extracellular matrix properties regulate cell proliferation, differentiation, and gene expression, playing pivotal roles in tissue development and disease. However, how mechanical forces activate key genes remains poorly understood.
To address this, we employed 3D magnetic twisting cytometry and biaxial cell stretching combined with RNA FISH to assess force-induced gene activation. We found that extracellular mechanical signals are sensed by integrins and transmitted through the cytoskeleton to the nucleus. At the nuclear envelope, forces are relayed to chromatin via inner nuclear membrane protein Lap2β, stretching decondensed chromatin to activate gene expression. Chromatin decondensation correlates inversely with H3K9me3 levels—high H3K9me3 maintains condensed chromatin refractory to activation[1]. Stretched chromatin recruits RNA Polymerase II (Pol II) to promoters, whereas compressed chromatin does not[2].
We applied these insights to cancer and valvular heart disease. For cancer stem cells (CSCs), we found that the synthetic retinoid WYC-209 binds RARγ, downregulates Cdc42, and reduces cellular traction force. This promotes chromatin decondensation, enables Pol II binding to apoptotic gene promoters, and induces CSC apoptosis. Co-administration of small-molecule inhibitors that further suppress traction force or decondense chromatin significantly enhances WYC-209 efficacy, providing novel mechano-chemical therapeutic strategies[3].
For valvular heart disease, we established a biomechanical-chemical strategy using defined substrate stiffness and small molecules to directly transdifferentiate human dermal fibroblasts into aortic valve endothelial-like cells. These cells were seeded onto decellularized scaffolds to construct tissue-engineered heart valves, which showed favorable function without immune rejection in a rat model. Substrate stiffness matching native aortic valves modulates chromatin accessibility via H3K9me3 regulation, promoting valvular endothelial gene expression and efficient transdifferentiation[4].
In summary, we elucidated force-induced gene expression mechanisms and applied them to uncover how WYC-209 induces CSC apoptosis and how fibroblasts transdifferentiate into valvular endothelial cells. These findings propose a mechano-chemical synergistic strategy for tumor suppression and a new paradigm for cellularized tissue-engineered heart valves.
References:
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# Mingxi Yao

**Southern University of Science and Technology**

## PRESENTATION TITLE

**Mechanical Regulation of Protein Homodimerization**

## BIOGRAPHY

Mingxi Yao, PhD, is a Principal Investigator in the Department of Biomedical Engineering at the Southern University of Science and Technology (SUSTech). He received his PhD in mechanobiology from the National University of Singapore and subsequently conducted postdoctoral research at the Mechanobiology Institute, Singapore. His research investigates how cells sense, transmit, and respond to mechanical signals, with a particular focus on adhesion-associated mechanosensing proteins. His group integrates single-molecule force spectroscopy, molecular tension probes, optogenetics, micro- and nanofabrication, and high-resolution live-cell imaging to uncover the molecular mechanisms underlying cellular mechanotransduction. By linking fundamental mechanobiology with pathological processes such as cancer, inflammation, fibrosis, and cardiovascular disease, his research seeks to advance both the basic understanding of cellular mechanics and the development of innovative biomedical applications.

## ABSTRACT

How cells transduce mechanical cues from the microenvironment into specific molecular response is a central question in understanding development, tissue homeostasis, and disease progression. Protein dimerization is a crucial mechanism for regulating the function of receptors and signaling molecules, conventionally thought to rely on biochemical inputs like ligand binding or phosphorylation. We discovered that mechanical force directly drive the transition of mechanosensitive proteins from a monomeric state to a homodimer. During this process, mechanical force performs work to reshape the free energy landscape of the monomeric and dimeric states, driving protein self-assembly and playing a critical regulatory role in physiological processes such as focal adhesion maturation and kidney development. These results demonstrate that mechanical force can directly participate in the regulation of protein structural states and self-assembly, providing new insights into the mechanisms of cellular mechanotransduction and offering novel strategies for disease interventions.



# Yihong Yang (online)

National University of Singapore

## PRESENTATION TITLE

**Preclinical models of addiction: from neural mechanisms to neuromodulation-based interventions**

## BIOGRAPHY

Dr. Yihong Yang is a Senior Investigator and Chief of the Neuroimaging Research Branch at the National Institute on Drug Abuse. He directs a research program aimed to develop neuroimaging and neuromodulation technologies and to advance understanding of neurobiological mechanisms of neurological and psychiatric disorders. Dr. Yang has published over 250 papers in scientific and medical journals, including Cell, Science Advance, Nature Mental Health, JAMA Psychiatry, and PNAS. He was elected as a Fellow of the International Society for Magnetic Resonance Imaging in Medicine (ISMRM) in 2007 and Fellow of the American Institute for Medical and Biological Engineering (AIMBE) in 2008.



# Yong He

Beijing Normal University

## PRESENTATION TITLE

**Charting structural and functional connectomes across the human lifespan**

## BIOGRAPHY

Dr. Yong He is a Changjiang Distinguished Professor at Beijing Normal University. He serves as the Director of Cognitive Neuroscience and Learning, a Principal Investigator at the IDG/McGovern Institute for Brain Research, and an Investigator at the Institute for Advanced Study, Beijing Normal University. He completed his PhD at the National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences (2002-2005) and was a postdoctoral fellow at the Montreal Neurological Institute, McGill University, Canada (2005-2007). Dr. He received numerous prestigious national awards and grants, including support from the National Natural Science Foundation of China (Innovative Research Groups, 2021) and National Science Fund for Distinguished Young Scholars (2012). To date, he has authored or co-authored over 200 peer-reviewed journal articles, with over 60,000 total citations and an H-index of 117. From 2016 to 2026, Dr. He was selected as one of Highly Cited Researchers in Neuroscience & Behavior (Clarivate Analytics). Dr He's research mainly focuses on imaging connectomics. Specifically, his team has developed various methodologies to describe the connectome architectures of brain networks. They have also established normative growth models across the lifespan for individual-based assessment and subtyping in brain disorders. Furthermore, his team has developed widely used graph-theoretical network analysis and visualization platforms for imaging connectomics (e.g., GRETNA and BrainNet Viewer). For details, see http://helab.bnu.edu.cn.

## ABSTRACT

The emergence, development, and aging of connectome architecture support the dynamic reorganization of network specialization and integration across the lifespan, which underlies continuous changes in human cognition and behavior. Understanding the spatiotemporal growth trajectory of the typical connectome is essential for elucidating network-level developmental principles in healthy individuals and for identifying periods of heightened vulnerability or developmental potential. In this talk, I will present our recent work on lifespan normative growth modeling of large-scale human connectomes, derived from multimodal structural and resting-state functional MRI data from over 30,000 individuals aged 0 to 80 years. Furthermore, I will demonstrate how these connectome-based normative models can be used to identify individual variations in brain network phenotypes across neurological and psychiatric conditions, including autism spectrum disorder, major depressive disorder, and Alzheimer's disease. We anticipate that this connectome-based growth modeling framework will help clarify the lifespan evolution of brain networks and provide a normative baseline for quantifying individual variation in development, aging, and neuropsychiatric disorders.



# Yaou Liu

**Beijing Tiantan Hospital, Capital Medical University**

## PRESENTATION TITLE

**Clinical Application of Brain Charts in Brain Diseases**

## BIOGRAPHY

Yaou Liu, MD, PhD, is a neuroradiologist and Professor of Radiology at Beijing Tiantan Hospital, Capital Medical University (National Center for Neurological Diseases). He works as the Chair and academic leader of the Radiology Department. He earned his first PhD from Capital Medical University in 2013 and a second PhD from VU University Amsterdam in 2017. His research centers on developing and validating MRI biomarkers for neurological diseases, mainly multiple sclerosis and brain tumors.

Dr. Liu has published more than 200 papers in high-impact journals such as Lancet Neurology, Nature Neuroscience, Brain, Radiology and Medical Image Analysis, and owns six patents to translate lab findings into clinical use. He has received over 20 domestic and international honors, including the Du Pré Award, McDonald Fellowship from the International Multiple Sclerosis Society, and the Neuroradiology Fellowship of the European Society of Radiology.

He has presided over multiple National Science Foundation projects and won prizes including National Leading Innovation Talent, National Young Top-Tier Talent and Young Beijing Scholar, and has won PACTRIMS Young Investigator Award and Best Poster Award.

## ABSTRACT

Quantifying deviations of individual brain structural and functional metrics from normative references (brain charts) serves as the core foundation for personalized brain health management, as well as precision diagnosis and treatment of brain disorders. This presentation systematically introduces the lifespan brain chart system for Chinese populations established from a large-scale nationwide multicenter healthy cohort, and its clinical applications. It elaborates the construction framework of normative references for both the brain and spinal cord, and demonstrates their clinical utility across more than 20 neurological diseases, including neurodegenerative diseases, neuroimmune disorders, brain tumors, and neuropsychiatric conditions. Deviation scores derived from brain charts support early disease screening, differential diagnosis, risk stratification and prognostic assessment at the individual level. This talk further discusses the integration of brain charts with artificial intelligence. By combining multi-modal imaging, multi-omics, and clinical big data, this integrated approach can optimize clinical workflows and enhance diagnostic performance, offering novel stratified diagnosis and treatment strategies for various brain disorders.



# Hong Yang

**Shanghai Children's Hospital, School of Medicine, Shanghai Jiaotong University**

## PRESENTATION TITLE

**Multimodal Neuroimaging Research on Depression Disorder**

## BIOGRAPHY

Chief Physician, Doctoral Supervisor, and Postdoctoral Supervisor

Director of the Department of Radiology, Children's Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

Major Academic Appointments

Standing Committee Member, Infectious and Inflammatory Radiology Committee, Chinese Research Hospital Association

Committee Member, Neural and Psychiatric Imaging Committee, Chinese Cognitive Science Society

Committee Member, Pediatric Radiology Group, Chinese Society of Radiology, Chinese Medical Association

Vice Chair, Pediatric Radiology Group, Radiology Branch of Shanghai Medical Association

Committee Member, Artificial Intelligence Committee, Shanghai Biomedical Engineering Society

Primary Research Interests

Neuroimaging and Oncologic Imaging

## ABSTRACT

To investigate gray-white matter functional connectivity in depression using fMRI, and to assess synaptic loss/dysfunction via $^{18}$F-UCB-H PET/MRI, in order to reveal the relationship between synaptic density loss and brain connectivity, thereby help to identify precise targets for clinical treatment.



# Shen Liu

**Shanghai Sixth People's Hospital, Shanghai Jiao Tong University School of Medicine**

## PRESENTATION TITLE

**The treatment of Peritendinous Anti-adhesion**

## BIOGRAPHY

Liu Shen, PhD, is a professor, chief physician, researcher, doctoral supervisor, and office director of the National Orthopedics Medical Center at Shanghai Sixth People's Hospital. He has received the National Science Fund for Distinguished Young Scholars, the Second Prize of the National Science and Technology Progress Award, the First Prize of the Shanghai "Yinshe" Award, and the First Prize of the Shanghai Technical Invention Award. He has published more than 60 research articles in journals including Nature Communications and Advanced Materials and holds over 30 patents. He serves as vice chairman of the Youth Committee of the Orthopaedic Branch of the Shanghai Medical Association, deputy director of the Orthopaedic Engineering Research Center for New Materials and Restoration and Regeneration, and a youth editor of Nano-Micro Letters.

## ABSTRACT

Tendon adhesion represents a major clinical challenge characterized by severe pain, functional disability, and high recurrence rates, often leading to a vicious cycle of "adhesion-surgical release-re-adhesion." This research systematically investigates the pathogenesis of tendon adhesion across three critical dimensions: inflammatory pain, adhesion formation, and postoperative adverse reactions. Single-cell transcriptomic analysis identifies macrophages as the predominant inflammatory cell population, with IL1B+ macrophages mediating peritendinous inflammatory pain. Lineage tracing demonstrates that bone marrow-derived mesenchymal stem cells differentiate into myofibroblasts, the primary effector cells of scar tissue, while SPP1+ macrophages recruit these cells and promote adhesion progression. The study further characterizes acute inflammation, chronic proliferation, and delayed tendon healing induced by anti-adhesion materials. Collectively, these findings elucidate the cellular and molecular mechanisms underlying tendon adhesion and provide scientific insights for targeted preventive and therapeutic strategies.



# Dong Liang

**Institute of Biomedical and Health Engineering, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science**

## PRESENTATION TITLE

**SIAT Advancements in MRI**

## BIOGRAPHY

Prof. Dong Liang is a Full Professor at the Institute of Biomedical and Health Engineering (IBHE), Shenzhen Institutes of Advanced Technology(SIAT), Chinese Academy of Science. He serves as Vice President of SIAT, Director of IBHE, and Deputy Director of State Key Laboratory of Biomedical Imaging Science and System. His primary research focuses on AI medical imaging, with a particular emphasis on AI-empowered magnetic resonance imaging (MRI) technologies and systems. He has led several major research projects, including the National Science Fund for Distinguished Young Scholars, and NSFC Key Programs, etc. He published 100+ journal papers in IEEE-TMI, MIA, MRM, etc. He served as the Associate Editor of IEEE TMI 2014-2024, and the Editorial Board Member of MRM from 2018. He is a recipient of multiple awards, including the first prize of the National Science and Technology Progress Award (2021).

## ABSTRACT

In this talk, SIAT advancements in MRI will be comprehensively introduced, including 5.0 T MRI and Live imaging.



# Hui Han

**Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences**

## PRESENTATION TITLE

### Overview of the State Key Laboratory of Magnetic Resonance Spectroscopy and Imaging and Frontiers in Medical Instrumentation

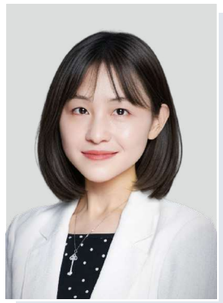
## BIOGRAPHY

Hui Han is a Professor and Director of the State Key Laboratory of Magnetic Resonance Spectroscopy and Imaging, sited at the Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences (CAS) in Wuhan. He has been selected for national and CAS leadership talent programs. He currently serves as Principal Investigator of the Major National Scientific Research Instrument Development Project of the National Natural Science Foundation of China, as well as a large-scale CAS Strategic Priority Research Project (Category B). Previously, he was Director of MR Engineering at Cedars-Sinai Medical Center in USA, and Associate Professor and Director of the MR System Laboratory at Weill Cornell Medicine, Cornell University. He had served as PI of four major NIH grants (R01, U01) in the past five years. He was recognized as the first to propose the concept of the integrated AC/DC shim-RF coils, a key innovative element in multiple large-scale BRAIN initiative projects. He also served as President of the Overseas Chinese Society for Magnetic Resonance in Medicine (OCSMRM) and Chair of the Engineering Study Group of the ISMRM.

## ABSTRACT

The State Key Laboratory of Magnetic Resonance Spectroscopy and Imaging, affiliated with the Institute of Precision Measurement Science and Technology, Chinese Academy of Sciences (formerly Wuhan Institute of Physics and Mathematics), is dedicated to addressing major national strategic needs and advancing the international frontier of magnetic resonance science. The laboratory focuses on fundamental MR physics, key enabling technologies, high-end instrumentation, and transformative biomedical applications, with the goal of establishing a world-leading innovation platform for magnetic resonance research. Its research encompasses ultra-high-field and low-field MRI, multinuclear magnetic resonance, ultrasensitive MR technologies, AI-enabled imaging, magnetic resonance spectroscopy, and molecular imaging, driving the evolution of magnetic resonance from conventional proton structural imaging toward multinuclear, functional, metabolic, and molecular imaging. These efforts promote the deep integration of fundamental science, clinical medicine, and the indigenous development of advanced medical instrumentation.

This presentation begins with an overview of the laboratory's strategic vision, research portfolio, and representative achievements. It then highlights recent advances in the in-house development of cutting-edge medical instrumentation, with a particular emphasis on magnetic resonance RF detection and coil technologies. Topics include next-generation integrated RF–shim coil technologies (iPRES/UNIC), active magnetic field control for high-field MRI, and the latest developments in novel magnetic resonance instrumentation and enabling technologies that enhance imaging performance and expand biomedical applications.



# Dan Wu

**Zhejiang University**

## PRESENTATION TITLE

### Development of Ultra-high-gradient MRI System and its Applications

## BIOGRAPHY

Dr. Dan Wu is a tenured and "Qiu Shi" Distinguished Professor, Vice Dean of the College of Biomedical Engineering and Instrument Science, Zhejiang University. Her main research focuses on the development of novel diffusion MRI pulse sequences, microstructural models, and development of novel MRI systems. She has published over 100 research papers in top-tier journals, including Science Advances, PNAS, Nature Communications, and Radiology, and holds over 30 authorized patents. She is the Fellow if the International Society for Magnetic Resonance in Medicine (ISMRM), and served as the Chair of the Diffusion Study Group of ISMRM. She also serves the Associate Editor of Human Brain Mapping. She was awarded as the Outstanding Young Scholar of NSFC, the China Youth May 4th Medal, and "35 Innovators Under 35" in China by MIT Technology Review.

## ABSTRACT

This talk will go over the histotry of MRI gradient system development, and then focusing on the development of ultra-high gradient head-only gradient systems, along with the pulse sequence development on these systems and their applications.



# Qiegen Liu

Nanchang University

## PRESENTATION TITLE

**Medical imaging reconstruction via generative representations of original data**

## BIOGRAPHY

Professor of Nanchang University. His main research focuses on the construction of intelligent imaging systems and visual display systems, signal processing and algorithm implementation. He has co-authored over 100 papers in authoritative journals such as IEEE TMI. He is a committee member of dozens of international and domestic academic organizations, including IEEE and CCF. He is a member of the editorial board of several journals including IEEE TMI and PhotoniX Life. He has led over 30 projects including the National Natural Science Foundation of China, as well as enterprise commissioned projects.

## ABSTRACT

The observation domain data in medical imaging (such as K-space in MRI, sinogram in PET/CT, etc.) carry complete physical sampling information. Their distribution characteristics differ fundamentally from those of image domain data and often exhibit non-uniformity and irregularity. Modeling and generation based on the original observation domain data provide a more principle-based path: directly depicting the distribution patterns jointly formed by the sampling signal and noise in the observation space, enabling the generation model to learn "how the signal is obtained" from the source. This report focuses on the structural characteristics of the original domain data and the generative learning paradigm, and shares two major research frontiers: one is to mine data characteristics and collaboratively build a generative model, mapping the complex and irregular observation distribution into multiple learnable and generalizable representation spaces, promoting rapid high-resolution imaging; the other is to introduce a generative base model to construct a universal original domain prior learning paradigm, achieving consistent generation and inference capabilities across tasks. Together, they provide a new theoretical framework and technical path for highly reliable and transferable intelligent imaging.



# Qiuqiang Zhan（online）

South China Normal University

## PRESENTATION TITLE

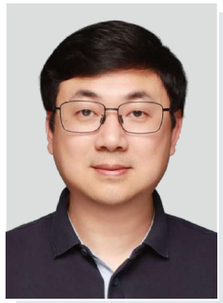
**高非线性稀土上转换荧光及超分辨生物成像**

## BIOGRAPHY

詹求强，华南师范大学二级教授、博士生导师，国家级青年人才项目获得者，广东省光电智能感知工程中心主任。本科和博士先后毕业于山东大学和浙江大学，曾在瑞典隆德大学、香港中文大学访学，主要从事光学超分辨显微术研究。近年来以（独立）通讯作者在 Nature Nanotechnology、Nature Photonics、Nature Communications、Light: Science & Applications、Advanced Photonics、Optica、Advanced Materials 等期刊发表论文 50 余篇，授权发明专利 30 余项。主持国家重点研发计划项目、国家自然科学基金重点及面上项目、广东省自然科学基金项目等，获中国光学领域十大影响力奖、广东省光学科技奖一等奖等荣誉。

## ABSTRACT

光学超分辨显微技术极大地推动了光子技术与生命科学的进步，针对超分辨成像中荧光激发和损耗非线性很低的原理性难题，报告人提出发展了系列上转换荧光超分辨显微原理，并实现了超分辨生物成像应用。例如，提出迁移光子雪崩高非线性激发机理，仅用单束三百微瓦连续光实现了 63 阶非线性荧光和 48 nm 成像分辨率以及细胞肌动蛋白成像；提出高非线性损耗机理，打破了 STED 理论限制，降低激光强度 4 个量级，仅用毫瓦级激光实现了 17 nm 分辨率和数小时时程的超分辨细胞成像。综合发展了近红外、低光强、超长时程的超分辨荧光成像方法和技术，为解决超分辨中一些技术瓶颈提供了新原理、新方法，在超长时程的高时间、空间分辨率生物成像中具有重要应用前景。



# Minbiao Ji

**Fudan University**

## PRESENTATION TITLE

**Stimulated Raman Histology for Label-free Cancer Diagnosis**

## BIOGRAPHY

Dr. Minbiao Ji received B.S. degree in Physics at Peking University, and his Ph.D degree in Physics at Stanford University. Afterwards, he joined the research group of Prof. Sunney Xie at Harvard University as a postdoctoral research fellow, working on coherent Raman scattering microscopy. Minbiao Ji is currently a Professor in the Department of Physics at Fudan University in Shanghai. His current research is focused on developing novel nonlinear optical spectroscopy and microscopy tools to study biomedical problems and material sciences, including nonlinear optical microscopy, stimulated Raman scattering (SRS) microscopy and transient absorption microscopy for label-free tissue histology and AI-assisted disease diagnosis.

## ABSTRACT

Rapid intraoperative diagnosis of human biopsy tissue is critically important for treatment strategy and timely decision-making. However, current standard histopathology is time-consuming and incompatible with fresh biopsies, such as gastroscopic biopsy and core-needle biopsy. We have integrated label-free stimulated Raman scattering (SRS) microscopy with various deep-learning algorithms to achieve instant and automated diagnosis of these biopsy tissues, enabling diagnostic classification, semantic segmentation, virtual staining and 3D volumetric histology. With the technical advances, we have demonstrated applications in multiple tumor types, including but not limited to brain tumor, gastric, prostate and breast cancers.



# Bing Li

**Shanghai Jiao Tong University School of Medicine Songjiang Research Institute**

## PRESENTATION TITLE

**Modulation of frontal cortical ignition during NREM sleep and general anesthesia**

## BIOGRAPHY

Dr. Bing Li earned his B.S. in Bioinformatics (2009) and Ph.D. in Biomedical Engineering (2014) from Huazhong University of Science and Technology. He completed postdoctoral training (2014–2018) and served as Assistant Researcher (2018–2024) at UC Berkeley and HHMI. Since September 2024, he has been a Professor and PI at Songjiang Research Institute, Shanghai Jiao Tong University School of Medicine.

His research focuses on sleep-wake mechanisms, sleep disorders, sleep-emotion interplay, and conscious perception. Employing functional ultrasound imaging, calcium imaging, optogenetics, and chemogenetics, he revealed that cortical ignition associated with awareness is inhibited during non-rapid-eye-movement (NREM) sleep by diminished cholinergic drive and strengthened PV-interneuron perisomatic inhibition, offering direct evidence for cortical modulation of sensation. Additionally, he identified a new microglial pathway in sleep regulation through calcium signaling and norepinephrine transmission, underscoring immune-neural crosstalk. He has published papers in Cell, Nature Neuroscience, PNAS, and National Science Review. He leads projects funded by the Overseas Young Talent Program, NSFC, and Lin-gang National Laboratory.

## ABSTRACT

Conscious perception is greatly diminished during sleep and general anesthesia, yet the underlying mechanism is poorly understood. We show that cortical ignition—a brain process shown to be associated with conscious awareness in humans and non-human primates—is strongly suppressed during non-rapid-eye-movement (NREM) sleep in mice due to reduced cholinergic modulation and rapid inhibition of cortical responses. This suppression manifests as a marked reduction in visual-to-frontal cortical activity propagation, due to strong inhibition of frontal pyramidal neurons. Chemogenetic activation and inactivation of basal forebrain cholinergic neurons powerfully increased and decreased visual-to-frontal activity propagation, respectively. Whereas dendritic-targeting GABAergic interneurons predominate in wakefulness, soma-targeting parvalbumin (PV)-expressing interneurons exhibit elevated activity during sleep. Chemogenetic modulation of PV interneurons revealed that sleep/wake-dependent cortical ignition is strongly modulated by perisomatic inhibition of pyramidal neurons. Both ketamine and isoflurane broadly suppress visual-to-frontal propagation, reduce ventral tegmental area (VTA) dopaminergic and basal forebrain cholinergic drive—with dopaminergic activity dipping below NREM levels—and eliminate the pronounced ignition suppression seen in NREM sleep. Thus, NREM sleep and general anesthesia globally inhibit cortical ignition through overlapping yet distinct mechanisms.



# Lin Li

**Xiamen University**

## PRESENTATION TITLE

**Mitochondrial Homeostasis and Intelligent Diagnosis & Treatment**

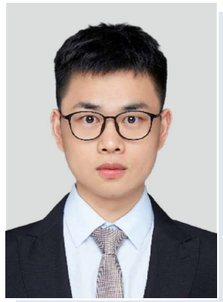
## BIOGRAPHY

Prof. Lin Li is a full Professor at Xiamen University. He earned his PhD in 2009 and completed postdoctoral research in chemical biology at the National University of Singapore. He returned to China in 2014 to join Academician Wei Huang's team at Nanjing Tech University's Institute of Advanced Materials, and joined Xiamen University faculty in 2023. His research focuses on mitochondrial homeostasis and intelligent theranostics, spanning health optoelectronics, chemical biology and biomedical engineering. His group has validated synthetic molecules for detecting and modulating mitochondria-associated biochemical factors at cellular, tissue and in vivo levels, and explored their translational potential in disease theranostics, drug development and wearable health electronics. He has published more than 300 academic papers in top journals such as Nature Communications, J. Am. Chem. Soc., Angew. Chem. Int. Ed. and Adv. Mater. He serves on the editorial boards of Research, FlexMat, and Chin. Chem. Lett., and holds leadership roles in the Biomedical Photonics Branch (CSBE) and the Smart Health Electronics Committee (CAAI). He was awarded the a National-level Young Talent in China (NSFC), and the youth ambassador for the Mc element in the Chinese Young Chemists Periodic Table.

## ABSTRACT

Mitochondrial homeostasis is the steady-state balance between mitochondrial biogenesis and degradation in the cells of an organism. Based on current research progress, the regulation of mitochondrial homeostasis is largely limited by the specificity and sensitivity of mitochondrial information extraction, leading to potential inaccuracies in precise identification and systematic analysis. This limitation hinders the ability to achieve early detection, precise medication, and autonomous prevention of clinically relevant diseases, resulting in missed opportunities for optimal intervention and treatment opportunities. Molecular imaging technology offers a valuable approach for accurately discerning mitochondria information, utilizing molecular probes as a fundamental tool. The development of mitochondria-targeted molecular probes is crucial for obtaining accurate spatial-temporal information of mitochondria during disease progression, thereby advancing the capabilities of molecular imaging technology in disease diagnosis and treatment. Furthermore, utilizing this information in conjunction with external interventions to modulate mitochondrial function can potentially minimize harm to the organism and improve treatment outcomes and prognosis. Then, in field of health engineering for chronic disease diagnosis and treatment, a significant challenge lies in enhancing proactive health capabilities of the general population is an important challenge to address disease prevention, early diagnosis, monitoring, and personalized assessment. The unique characteristics of mitochondrial-related diseases provides possibilities for constructing proactive health strategies based on energy metabolism phenotype differences, which are expected to offer practical strategies for the pre-diagnosis and treatment of diseases. Over the past decade, our research has centered on detection of mitochondrial biochemical factors, regulation of mitochondrial functions, and application of related bioelectronic devices. We committed to identify molecular targets, analyzing biological functions, and intervening in endpoint events at the in vivo level using diseases models such as cancers and Parkinson's disease. Our objective is to provide new concepts, new technologies, and new tools for intelligent disease treatment research.





# Wenbo Hu

**Northwestern Polytechnical University**

## PRESENTATION TITLE

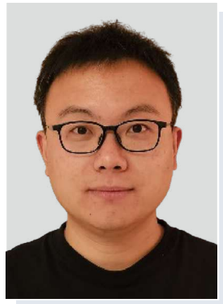
**Manipulating Intermolecular Electron Transfer in Organic Photosensitizers for Type I Photodynamic Therapy**

## BIOGRAPHY

Professor Wenbo Hu is a professor at Northwestern Polytechnical University, China. He received his Ph.D. from Nanjing University of Posts and Telecommunications and conducted postdoctoral research at Nanjing Tech University and the University at Buffalo, State University of New York. His research interests include ultrafast excited-state dynamics, optical imaging, and photodynamic therapy. He has led several projects funded by the National Natural Science Foundation of China and has been recognized as one of the world's top 2% of scientists.

## ABSTRACT

Bacterial infections have become a major threat to global public health, further aggravated by the rapid rise of antibiotic resistance. Antibacterial photodynamic therapy (aPDT) has therefore attracted growing attention as a promising non-antibiotic strategy with broad-spectrum antibacterial activity and a low risk of inducing resistance. Photosensitizers play a decisive role in determining aPDT efficacy. Compared with Type II systems, Type I photosensitizers exhibit superior potential in hypoxic infection microenvironments owing to their reduced dependence on molecular oxygen. In this presentation, we focus on the ultrafast intermolecular electron transfer processes in Type I organic photosensitizer clusters and systematically investigate their key kinetic pathways and structure-dependent regulation. On this basis, a photophysical conversion dynamics model is established to clarify the intrinsic relationship among molecular assembly, intermolecular electron transfer, and photodynamic performance. This study provides a theoretical foundation for the rational development of high-efficiency antibacterial photosensitizers and advances the practical application of aPDT.




# Jia Li

**ShanghaiTech University**


**PRESENTATION TITLE**

## Glia control of meningeal lymphatic development

## BIOGRAPHY

Jia Li, Ph.D., is a tenure-track Assistant Professor, Research Professor, and Ph.D. Supervisor in the School of Life Science and Technology at ShanghaiTech University. He received his B.S. degree from Northwest University and his Ph.D. from the Institute of Health Sciences, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences. He subsequently completed postdoctoral training at the Institute of Neuroscience, Chinese Academy of Sciences; Nanyang Technological University, Singapore; and the University of California, San Diego School of Medicine. He is a member of the Youth Innovation Promotion Association of the Chinese Academy of Sciences. His research focuses on the cerebral vascular and brain lymphatic systems. By integrating genetic manipulation, in vivo imaging, lineage tracing, and related approaches, his laboratory investigates the developmental and disease mechanisms of brain blood vessels and lymphatic structures from the perspective of neural regulation. He has published 14 SCI-indexed papers as first and/or corresponding author in journals including Cell, Cell Research, Cell Reports, Cardiovascular Research, Science Advances. He holds two granted patents and received the 2020 Sanofi–Shanghai Institutes for Biological Sciences Outstanding Young Investigator Award. He has served as principal investigator on National Natural Science Foundation of China Young Scientists and General Programs, a Shanghai Municipal Science and Technology Commission General Program, and a Special Fund of the China Postdoctoral Science Foundation, and has participated in a National Key R&D Program of China.

## ABSTRACT

The nervous system regulates peripheral immune responses under physiological and pathological conditions, but the brain’s impact on immune system development remains unknown. Meningeal mural lymphatic endothelial cells (muLECs), embedded in the leptomeninges, form an immune niche surrounding the brain that contribute to brain immunosurveillance. Here we report that the brain controls the development of muLECs via a specialized glia subpopulation, slc6a11b+ radial astrocytes (RAs), a process modulated by neural activity in zebrafish. slc6a11b+ RAs, with processes extending to the meninges, govern muLEC formation by expressing vascular endothelial growth factor C (vegfc). Moreover, neural activity regulates muLEC development, and this regulation requires Vegfc in slc6a11b+ RAs. Intriguingly, slc6a11b+ RAs cooperate with ccbe1+ fibroblasts to restrict muLEC growth on the brain surface via controlling mature Vegfc distribution. Thus, our study uncovers a glia-mediated and neural activity-regulated control of brain lymphatic development and highlights the importance of inter-tissue cellular cooperation in development.




# Xiaolei Zuo

**Institute of Molecular Medicine, Renji Hospital, School of Medicine, Shanghai Jiao Tong University**


**PRESENTATION TITLE**

## DNA Frameworks-based Biosensors

## BIOGRAPHY

Xiaolei Zuo received his Ph.D. degree from Shanghai Institute of Applied Physics, Chinese Academy of Science (2008). He was a postdoctoral fellow at University of California, Santa Barbara, USA (2008-2010), and at Los Alamos National Laboratory, USA (2010-2012). Now he is a professor of the Institute of Molecular Medicine, Renji Hospital, School of Medicine, Shanghai Jiao Tong University. His research interests include DNA electrochemical biosensors, 3D DNA probes, and DNA memory.

## ABSTRACT

Self-assembled DNA frameworks with precise sizes allow a programmable “soft lithography” approach to engineer the interface of electrochemical DNA sensors. By using millimeter-sized gold electrodes modified with several types of tetrahedral DNA frameworks (TDFs) of different sizes, both the kinetics and thermodynamics of DNA hybridization were profoundly affected. Because each DNA probe is anchored on an individual TDF, its lateral spacing and interactions are finely tuned by the TDF size. By simply varying the size of the TDFs, the hybridization time was decreased and the hybridization efficiency was increased. More significantly, the detection limit for DNA detection was tuned over four orders of magnitude with differentially nanostructured electrodes, and achieved attomolar sensitivity with polymeric enzyme amplification. Our programmable biosensing interface can be easily generalized to the sensitive detection of proteins, small molecules and even cells by conjugating antibody or aptamer on the top vertex of our DNA framework probe.



# Yongxi Zhao

Xi'an Jiaotong University

## PRESENTATION TITLE

**DNA-Encoded Bioanalysis**

## BIOGRAPHY

Prof. Yongxi Zhao is the Dean of the Frontier Institute of Science and Technology at Xi'an Jiaotong University, where he serves as a Grade II Professor and doctoral supervisor. He is a recipient of the National Science Fund for Distinguished Young Scholars and has been selected for a national-level young talent program. He serves as principal investigator of a Major Research Instrument Development Project funded by the National Natural Science Foundation of China and leads a Shaanxi Provincial Innovation Team. His research primarily focuses on biosensing and bioimaging, single-cell analysis and nucleic acid sequencing. As a corresponding author, he has published numerous papers in renowned domestic and international journals, including Chem. Rev., Proc. Natl. Acad. Sci., Nat. Protoc., Nat. Commun., J. Am. Chem. Soc., Angew. Chem. Int. Ed. and Nucleic Acids Res. He holds more than 20 granted Chinese invention patents and has received several major awards, including the First Prize of the Shaanxi Provincial Natural Science Award. He also serves on the editorial boards of several academic journals and holds leadership positions in the China Association for Instrumental Analysis, including Vice Chair of its Nucleic Acid Analysis Branch.

## ABSTRACT

Biomolecules, including proteins and nucleic acids, are essential components that govern cellular functions and represent important biomarkers for various diseases. The molecular identity, abundance, and spatiotemporal organization of these biomolecules within cells are closely associated with biological activities and disease progression. Therefore, precise acquisition of multidimensional biomolecular information is critical for understanding fundamental biological processes and elucidating disease mechanisms. This report focuses on key scientific challenges arising from the crowded intracellular environment, including the low abundance, high diversity and dense spatial distribution of biomolecules. By harnessing the programmability of DNA, we have developed a series of DNA-based molecular assembly systems and reaction pathways for precise molecular recognition and labeling. Based on DNA encoding strategies, we further established a suite of bioanalytical approaches that significantly expand fluorescence multiplexing capacity by orders of magnitude, enable accurate quantification of densely packed biomolecules beyond the diffraction-limited spatial resolution, and facilitate comprehensive profiling of multilayered molecular information within the nanoscale environment of individual cells. These advances provide powerful technological platforms for dissecting complex biological systems and offer new opportunities for revealing the molecular principles underlying cellular functions and disease mechanisms.





# Guoliang Ke

Hunan University

## PRESENTATION TITLE

**Size-Selective Molecular Recognition Probes**

## BIOGRAPHY

Dr. Guoliang Ke is a professor in State Key Laboratory of Chemo and Biosensing, and College of Chemistry and Chemical Engineering at Hunan University. He received his B.S. (2010) and Ph.D. degrees (2016) from Xiamen University, and was a visiting scholar at Arizona State University during 2013-2015. He is a winner of the National Natural Science Foundation of China (NSFC) for Excellent Young Scholars, and servs as an Early Career Board member of Analytical Chemistry. His research focuses on DNA nanotechnology and biosensing. He has published more than 40 papers on Nat. Commun., Sci. Adv., J. Am. Chem. Soc., Angew. Chem. Int. Ed., Chem. Soc. Rev. and so on.

## ABSTRACT

Size-selective recognition systems based on size differences of biomolecules (such as nuclear pores) play a crucial role in biological processes. Inspired by this, the development of biomimetic size-selective molecular recognition strategies is of great significance in biological separation and analysis. For example, microRNAs (miRNAs) regulate two-third of human genes and serve as important disease markers, thus accurate biosensing of miRNAs is highly important. However, traditional probes (based on sequence-selective recognition) are susceptible to signal interference from pre-microRNAs (microRNA precursors). To this end, by leveraging the size difference between mature microRNAs (approximately 20 nt) and microRNA precursors (approximately 60-70 nt), we constructed a size-selective molecular recognition probe based on a DNA molecular sieve, which significantly reduces the signal interference from microRNA precursors. The probe enables the precise detection of mature microRNAs in cells and clinical blood samples, demonstrating the application potential of size-selective molecular recognition strategies in life science research and clinical diagnosis.



# Xin Su

**Beijing University of Chemical Technology**

## PRESENTATION TITLE

**Biomedical applications of nucleases**

## BIOGRAPHY

Xin Su is a professor and doctoral supervisor in the College of Life Science and Technology at Beijing University of Chemical Technology. Dr. Su's research focuses on in vitro diagnostics, biosensing and nanobiotechnology, with an emphasis on nucleic-acid reaction networks, single-molecule sensing and biomedical applications of DNA nanotechnology. Dr. Su's group develops fast, amplification-free and highly sensitive methods for detecting nucleic acids, proteins and small molecules, and has reported DNA-guided nuclease systems, DNA molecular computing strategies and molecular probes for liquid biopsy. Dr. Su has led national talent and research projects, including National Natural Science Foundation of China and National Key Research and Development Program projects. Dr. Su has published more than 60 papers as first or corresponding author in journals including Nature Biotechnology, Nature Communications, Advanced Materials, ACS Nano and Advanced Science, and holds several Chinese invention patents. Dr. Su also serves as a young editorial board member of Exploration and has received honors including the Beijing Nova Program and the Zhu Liangyi Innovation Award.

## ABSTRACT

Nucleases are fundamental tools for processing nucleic acids, yet their chemical biology still contains underexplored properties and applications. This presentation discusses how classic nuclease systems can be rediscovered, repurposed and regulated to create new biomedical technologies. First, the talk introduces a newly identified activity of bacteriophage lambda exonuclease: in cooperation with a 5'-phosphorylated DNA guide, lambda Exo can invade and recognize double-stranded DNA or DNA-RNA duplexes at ambient conditions without a PAM-like sequence requirement. This DNA-guided recognition enables sensitive single-molecule, non-amplification assays for pathogens, tumor biomarkers and gene mutations, and offers a route to in situ gene imaging. Second, the presentation shows how familiar activities of polymerases, ExoIII and RNase H can be turned into nucleic-acid information processing tools for molecular computing, rapid diagnostics, information writing and erasing, and catalytic editing of extracellular miRNA in the tumor microenvironment. Finally, it discusses broad regulators of nuclease activity, including ions, small molecules and biomolecules, and the construction of smart molecular arrays that generate kinetic enzyme spectra for rapid classification of complex mixtures in food authentication, fermentation monitoring and pharmaceutical synthesis. Together, these examples illustrate nucleases as a rich chemical-biology toolkit for sensing, diagnosis, molecular computation and nanomedicine.



# Peng Dai

**Peking University**

## PRESENTATION TITLE

**Development of Precise Labeling and Nano-Delivery Toolkits for Glycan Research**

## BIOGRAPHY

Dr. Peng Dai received his bachelor's degrees in chemical biology from Peking University in 2013. He then obtained his PhD degree in chemistry from Massachusetts Institute of Technology, under the supervision of Professor Bradley Pentelute in 2018. After completion of the postdoctoral research at Rice University in the lab of Professor David Yu Zhang, Dr. Dai joined NuProbe USA. Inc. as a senior research scientist.

In 2021, Dr. Dai joined College of Chemistry and Molecular engineering, Peking University as a Research Associate Professor. His current research interests are focused on chemical glycobiology. Towards the goal of deciphering the glycocode, he is interested in developing novel labeling, synthetic and analysis tools, and integrating multidisciplinary technologies to understand the structure and function of glycans.

## ABSTRACT

Precise labeling of glycans is vital for bioimaging and functional studies. However, affinity probes recognizing glycans with high specificity remain scarce. We developed glycan recombinant affinity binders (GRABs) based on mutant glycosidases from bacteria, which are enzymatically inactive and preserve stringent specificity for recognizing the glycan substrates. By mutating a key catalytic residue of a pan-specific sialidase and an α2,3 sialidase, we develop GRAB-Sia and GRAB-Sia3 recognizing total sialoglycans and α2,3-linked sialosides, respectively. GRAB-Sia and GRAB-Sia3 exhibit stringent substrate and linkage specificity. The GRABs are further tetramerized with streptavidin, which greatly enhances the avidity of sialoglycan binding. Bacterial glycosyltransferases are essential for developing chemoenzymatic tools for the precise synthesis and engineering of glycoproteins in a site-specific manner. We report a powerful tool for site-specifically O-glucosylating a broad range of eukaryotic proteins, recognizing the strikingly short two-residue motifs (G-T/S and S-G) which ubiquitously exist in eukaryotic proteins and can be easily introduced. The rapid clearance of nanoparticles by the mononuclear phagocyte system (MPS) severely compromises nanocarrier delivery efficiency and reduces the isolation yield of circulating biomarkers such as nucleosome-bound cell-free DNA (cfDNA) and exosomes. While liposome-based preconditioning is a promising strategy for transient MPS blockade, effective formulations remain scarce. We developed a MPS blockade for enhanced liposome-assisted metabolic glycan labeling and circulating biomarker detection in mice




# Shichao Ding

**Westlake University**


## PRESENTATION TITLE

**Integrated Non-invasive Sweat Metabolic Sensing System for Healthcare**

## BIOGRAPHY

Shichao Ding is currently an Assistant Professor at School of Engineering of Westlake University, and research on flexible sensors and bioelectronic devices. He received his PhD degree from Washington State University in 2022. He was a Postdoctoral Scholar at University of California San Diego with Prof. Joseph Wang from 2022 to 2026, focusing on wearable microgrids and flexible bioelectronic devices. In 2025, he was recognized by Stanford University and Elsevier as one of the top 2% of scientists worldwide. Until now, he has published over 120 SCI papers, among which 49 were published as the first/corresponding author on Nature Medicine, Nature Electronics, Nature Sensors, Nature Reviews Materials, Nature Reviews Electrical Engineering, Nature Communications, Advanced Materials, etc. His work has been cited nearly 7,500 times, with an H-index of 47. His research have been featured in by multiple Nature sister journals, and reported by more than 100 media outlets whole world including CNN and Fox News. Relevant achievements were also invited to be presented at the United States Congress.

## ABSTRACT

Sweat provides a promising noninvasive biointerface for continuous metabolic monitoring and personalized healthcare. However, the practical application of wearable sweat sensors remains limited by the difficulty of collecting trace resting sweat, unstable electrochemical interfaces, insufficient detection accuracy, and limited long-term system operation. This work presents the development of integrated sweat-based sensing systems through three generations of wearable devices, addressing trace sweat sampling, reliable biochemical transduction, continuous multi-biomarker monitoring, and autonomous operation. First, a fingertip-based solid-state sensing interface was developed for rapid noninvasive glucose measurement from resting sweat. Microscale interdigitated electrodes shortened ionic transport and molecular diffusion pathways, enabling stable electrochemical detection from ultralow-volume sweat films without conventional liquid reservoirs. Combined with individualized lag-time correction and sweat-to-blood glucose calibration, the system enabled rapid touch-based measurements and improved agreement with blood glucose fluctuations. Second, a miniaturized biochemical smart ring was established for continuous metabolic monitoring. A hyperosmotic hydrogel, paper-based microfluidic pathway, and evaporation-assisted transport mechanism enabled passive extraction and continuous renewal of resting sweat. Coupled with a multichannel electrochemical sensor array, the ring enabled wireless monitoring of glucose, ketones, lactate, uric acid, alcohol, and vitamin C. Finally, energy harvesting, flexible energy storage, low-power electronics, and adaptive power management were integrated to support automated sensing and wireless data transmission. These advances establish a progressive pathway from single-point detection to continuous multi-biomarker monitoring and autonomous wearable integration, providing a technological foundation for metabolic assessment, chronic disease monitoring, medication management, and personalized healthcare.






# Chuhong Zhu

**Army Medical University**


## PRESENTATION TITLE

**Applications of Organoids in Cardiovascular Regenerative Medicine**

## BIOGRAPHY

Professor Chu-Hong Zhu, a National Distinguished Young Scientist in tissue engineering, serves as the Principal Investigator of a National Key R&D Program of China and Chair of the Vascular Branch of the Chinese Society for Anatomy. He is currently Director of the Department of Human Anatomy at Army Medical University, Director of the Ministry of Education's Engineering Research Center for Tissue Organ Regeneration and Manufacturing, and Director of Chongqing's Major Scientific Innovation Infrastructure: the Intelligent Biofabrication Engineering Research Center for Organs.His research focuses on engineered blood vessels, complex tissues, and organoid construction. Supported by over ten projects—including a key National Natural Science Foundation of China grant—he has addressed critical clinical challenges by overcoming thrombosis in small-diameter engineered vessels and vascularization barriers in complex tissues/organoids. He developed the world's smallest-caliber tissue-engineered vessel to enter clinical trials, the first arterial vascular organoid, and a multi-modal organ-on-a-chip system, laying the foundation for industrial applications.He has published 30+ papers as corresponding author in journals like Advanced Materials and Science Advances, secured 80+ patents, and obtained 17 Class III medical device certifications. His technologies have been adopted by 1,000+ military and civilian institutions. Honors include: Military Outstanding Scientific Personnel Allowance (Class I), State Council Special Government Allowance, First Prize of Chongqing Technological Invention Award, and Second Prizes in Military/Chongqing Science Progress Awards. He has mentored awardees of the National Excellent Young Scientists Fund and National Defense Distinguished Young Scholars.

## ABSTRACT

Organoids are in vitro models based on developmental biology and tissue engineering that partially replicate the complex structures and functions of human tissues/organs. They enable research into tissue development, regeneration, and repair mechanisms, as well as disease diagnosis, modeling, drug discovery, and personalized medicine. However, organoid cultures often exhibit cellular heterogeneity, uncontrolled morphogenesis during self-organization, and lack key components like stroma, vasculature, and nerves.Engineering cell/tissue niches via biomaterials may overcome these limitations. We designed a mechanically matched, structurally stable bionic ECM hydrogel to support vascular organoid development in vitro and delivery in vivo, achieving rapid vascularization in cerebral infarction areas and promoting brain tissue regeneration. By embedding human blood vessel organoids (hBVOs) in dynamic/non-dynamic synthetic hydrogels, we investigated how extracellular matrix viscoelasticity regulates hBVO maturation. Through immunohistochemistry, transmission electron microscopy, single-cell sequencing, and in vivo transplantation, we pioneered a strategy to induce hBVOs into human micro-arteries in vitro, offering new pathways for regenerative medicine.



# Bin Li

**Soochow University**

## PRESENTATION TITLE

**Intervertebral disc regeneration: biomaterials and multimodal mechano-regulation**

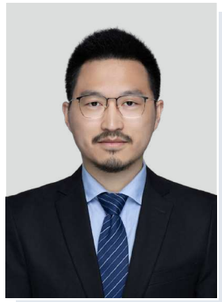
## BIOGRAPHY

Prof. Bin Li is currently the Executive Dean of Suzhou Medical College, Deputy Director of Orthopedic Institute, and Director of Medical 3D Printing Center of the First Affiliated Hospital at Soochow University. He received the bachelor degree in 1996 and PhD degree in Materials Science in 2001 from Tsinghua University. He then worked as a Research Associate at the Institute of Materials Research and Engineering, Singapore until 2004. After that he pursued postdoctoral training at University of Pittsburgh in USA before joining Soochow University in 2009. He is the recipient of National Science Fund for Distinguished Young Scholars, Fellow of American Institute for Medical and Biological Engineering (AIMBE), Fellow of International Combined Orthopaedic Research Societies (ICORS), Fellow of International Union of Societies for Biomaterials Science and Engineering (IUSBSE), Fellow of International Chinese Musculoskeletal Research Society (ICMRS), and Fellow of Chinese Society for Biomaterials (CSBM). He is the Chair of Society Development Committee of ICMRS and Chair-elect of the Tissue Engineering and Regenerative Medicine Chapter of Chinese Society of Biomedical Engineering. He is currently the Editor-in-Chief of Biomedical Materials and Associate Editor of Journal of Orthopaedic Translation, Frontiers in Bioengineering and Biotechnology, and Biomaterials Translational. He has published over 240 articles and 15 book chapters. His research interests include biomaterials, mechanobiology and regenerative medicine.

## ABSTRACT

A major cause of neck and low back pains, degenerative disc disease (DDD) has become a prevailing health problem worldwide and significantly contributes to healthcare expenditures. Current conservative or surgical treatments for DDD can hardly reverse the biological function of degenerated intervertebral disc (IVD) and in some cases, may even lead to degenerative changes in adjacent vertebrae. In the last two decades, there has been a surge of interest in fabricating IVD replacements using tissue engineering strategies for DDD therapy. However, major challenge remains toward fabricating annulus fibrosus (AF) replacements that are biologically and functionally comparable to native tissue, largely due to the tremendous complexity of AF tissue at cellular, biochemical, microstructural, and biomechanical aspects. In recent years, we have employed a combination of tissue engineering strategies including layer-by-layer assembly, multimodal mechano-regulation, controlled drug delivery, and 3D printing in order to address the heterogeneity feature of AF tissue toward effective IVD regeneration. Findings from these studies may provide new insights toward developing engineered IVDs whose biological features and mechanical functions approximate those of native tissue.





# Kai Wang

**Peking University**

## PRESENTATION TITLE

**Injectable vascular organoids for ischemic diseases**

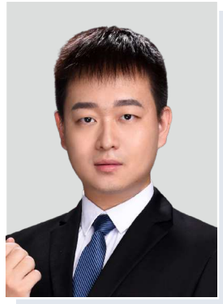
## BIOGRAPHY

Professor Kai Wang is an Assistant Professor in the Department of Physiology and Pathophysiology, Peking University. He also serves as a PI in the State Key Laboratory of Vascular Homeostasis and Remodeling. He earned his Ph.D degree at Peking University and finished his postdoctoral training in Harvard Medical School/Boston Children's Hospital and Cornell University from 2016 to 2021. His lab focuses on the interdisciplinary research on the stem cells and vascular organoid. He now serves as Associate Editor in the journal of Microvascular Research and Cell Organoid while sitting in the editorial board of Cell Transplantation. He has published 18 peer-reviewed papers in highly impacted scientific journals including Sci Adv, Adv Sci, Adv Mat, Biomaterials and et al. He also serves as ad hoc reviewer for journals including Sci Adv, ACS Nano, Angiogenesis and et al.

## ABSTRACT

Ischemic diseases, caused by blood vessel occlusion or disrupted hemodynamics, result in tissue ischemia, hypoxia, and cell death. These conditions are a leading global cause of mortality, significantly affecting health, life expectancy, and healthcare systems. While coronary intervention and bypass surgeries offer treatment for ischemic heart disease, critical lower limb ischemia, especially diabetic foot ulcers, lacks effective therapies, necessitating advanced research. Recent advancements highlight the therapeutic potential of stem cell-derived endothelial cells, mesenchymal stem cells, and organoids. Organoids, as 3D multicellular assemblies, mimic organ structures and functions, offering promising avenues for disease modeling and regenerative treatments. Vascular organoids, in particular, show potential for ischemic disease treatment, though challenges like differentiation efficiency, immune rejection, and engraftment remain.

Our research focuses on refining differentiation protocols for vascular organoids to enhance angiogenesis and clinical applicability. Leveraging transcription factors ETV2 and NKX3.1, we have developed efficient methods to differentiate pluripotent stem cells into vascular endothelial and smooth muscle cells. Using small molecules and growth factors in a 3D bioreactor, we have successfully created vascular organoids capable of forming perfusable networks in vitro and in vivo. This project aims to optimize these organoids and apply them to treat acute myocardial ischemia and critical lower limb ischemia, paving the way for clinical translation and innovative ischemic disease therapies.



# Zeyang Liu

**Peking University**

## PRESENTATION TITLE

**Engineering Mechanical Immune Interfaces to Enhance CAR-T Cell Expansion and Functional Persistence**

## BIOGRAPHY

Zeyang Liu, Ph.D., is an Assistant Professor and Principal Investigator at the Institute of Advanced Clinical Medicine, Peking University, and at the Beijing Center for Cell Homeostasis and Aging-Related Diseases. He is a recipient of the National Overseas High-Level Young Talent Program. Dr. Liu obtained his Ph.D. from Nagoya University in 2018 and conducted postdoctoral research at the University of California, Los Angeles (UCLA) from 2022 to 2025. His research focuses on biomechanics and immune engineering, particularly on how mechanical cues in the microenvironment regulate immune cell activation, metabolic reprogramming, and cell fate decisions. His work centers on the role of mechanical signals in T cell immune responses, in which he has developed artificial antigen-presenting systems with tunable mechanical properties to investigate how biophysical parameters influence antigen-specific T cell function systematically. Dr. Liu has published as first or co-first author in leading journals, including Nature Biomedical Engineering, Nature Protocols, Nature Reviews Bioengineering, and Cell Biomaterials. He currently serves on the young editorial board of Med-X.

## ABSTRACT

T cell-based therapies, particularly CAR-T cell therapy, have shown remarkable promise for cancer treatment. However, current ex vivo T cell activation and expansion strategies remain suboptimal. Conventional antibody-coated paramagnetic polystyrene beads, such as Dynabeads, efficiently provide biochemical stimulation but lack key physical features of natural antigen-presenting cells (APCs). These beads are rigid, non-deformable, and mechanically distinct from native APCs, which are much softer and exhibit viscoelastic behaviors that regulate ligand–receptor engagement, immune synapse formation, and downstream T cell activation. As a result, conventional activation platforms may drive excessive differentiation, reduce stemness, and limit the long-term persistence and therapeutic potency of engineered T cells. Although monocyte-derived dendritic cells (moDCs) provide a more biological activation interface, they are heterogeneous, donor-dependent, and often generated under inflammatory conditions that do not fully recapitulate physiological antigen presentation. Therefore, next-generation artificial APCs should integrate well-defined biochemical stimulation with tunable mechanical cues that better mimic natural APCs and enable more effective T cell manufacturing. Here, we develop synthetic viscoelastic activating cells as mechanically tunable immune interfaces to enhance T cell expansion, preserve stem-like phenotypes, and improve antitumor potency.





# Peng Zhang

**Zhejiang University**

## PRESENTATION TITLE

**AI-guided Design of Antimicrobial Polymers**

## BIOGRAPHY

Prof. Zhang received his Ph.D. degree in Chemical Engineering from the University of Washington under the supervision of Prof. Shaoyi Jiang in 2018. From 2018 to 2020, he was a postdoc associate in the laboratory of Prof. Robert Langer and Prof. Daniel Anderson at the Koch Institute for Integrative Cancer Research at MIT. Prof. Zhang joined the Department of Polymer Science and Engineering at Zhejiang University in 2020. His research focused on the development of polymeric biomaterials for medical applications, including macromolecular drugs, implants, and biointerfaces, as well as AI-guided biomaterial research. He has published more than 80 peer-reviewed papers in top journals, including Nat. Biomed. Eng, Sci. Transl. Med, Nat. Comput. Sci., Nat. Commun., PNAS, JACS, Adv. Mater., Chem. Rev., etc., with 9000+ citations and an H-index of 40.

## ABSTRACT

Antimicrobial polymers that mimic the mechanism of action of antimicrobial peptides represent a crucial approach to combating the crisis of multidrug-resistant bacteria. However, the design of such polymers remains challenging due to the complexity of both their mechanisms of action and their structures. Deep learning methods have achieved great success in the design of antimicrobial peptides, but their application to the design of antimicrobial polymers is still limited. Owing to the structural complexity of polymer chemistry, a unified deep learning framework has not yet been established. Existing self-supervised learning approaches often simplify polymers to repeating units, neglecting their inherent periodicity, which restricts the model's generalization capability across multiple tasks. To address this issue, we propose PerioGT, a periodicity-aware deep learning model for polymers. During the pre-training phase, PerioGT incorporates periodicity priors derived from chemical knowledge and effectively embeds them into the model via contrastive learning. In the fine-tuning stage, it further learns periodic prompts to better utilize the periodic knowledge acquired during pre-training. In addition, we design a novel graph augmentation strategy that introduces virtual nodes to integrate auxiliary conditions, thereby simulating complex chemical interactions more effectively. PerioGT achieves state-of-the-art performance on 16 downstream tasks, demonstrating its potential for functional polymer screening.

Building upon PerioGT, we further develop an automated polymer evolution framework, PolyCLOVER, for the efficient discovery of polymeric antibiotics with both antimicrobial activity and low toxicity. This framework integrates multi-stage self-supervised learning, active learning, and high-throughput experimentation, enabling effective exploration of the vast polymer chemical space even under data-scarce conditions. Applied to a combinatorial library of approximately 100,000 poly(β-amino ester) compounds, PolyCLOVER successfully identifies three lead compounds that self-assemble into stable nanoparticles (SANPs), exhibiting minimum inhibitory concentrations of 4 μg/mL and 8 μg/mL against multidrug-resistant Staphylococcus aureus and Acinetobacter baumannii, respectively. These nanoparticles can also serve as antibiotic carriers, restoring bacterial susceptibility to penicillin G. In vivo experiments confirm their efficacy both as standalone treatments and in combination with antibiotics. PolyCLOVER demonstrates the ability to efficiently discover novel functional polymer materials without relying on external datasets. Overall, this work presents a unified modeling and automated design paradigm for polymers, offering a new technological foundation for the intelligent development of functional polymer materials.



# Zhenhua Li

**Southern Medical University**

## PRESENTATION TITLE

**Bioactive Materials for Cardio-Oncology**

## BIOGRAPHY

Zhenhua Li is a Professor and Ph.D. Supervisor at Southern Medical University. He completed his postdoctoral training in Biomedical Engineering at the University of North Carolina at Chapel Hill and North Carolina State University (2017–2020). His research focuses on biomaterials for myocardial tissue engineering and regenerative medicine. He serves as Secretary General of the Nanobiology Branch of the Biophysical Society of China and holds committee memberships in several national academic societies. He has published extensively as corresponding author in leading journals, including Nat. Biomed. Eng. （2）、Nat. Commun. （2）、Adv. Mater. （3）. His publications have received over 11,000 citations, with an H-index of 62, and he has been recognized among the World's Top 2% Scientists for four consecutive years. He has led four National Natural Science Foundation of China (NSFC) projects, including the National Excellent Young Scientists Fund, and currently serves on the editorial boards of Extracellular Vesicle and European Cells & Materials.

## ABSTRACT

With continuous advances in cancer diagnosis and treatment, the survival of patients with malignant tumors has improved significantly. However, cardiovascular complications associated with anticancer therapies, including radiotherapy, chemotherapy, immunotherapy, and surgery, have become an increasingly important clinical challenge, driving the rapid development of the field of cardio-oncology. Our laboratory is dedicated to developing bioactive materials to prevent and treat cancer therapy-related cardiotoxicity while elucidating the molecular mechanisms linking cancer and cardiovascular disease. By leveraging the unique properties of bioactive materials—including their biocompatibility, biodegradability, and ability to modulate cellular behavior, immune responses, and tissue remodeling—we aim to develop innovative therapeutic strategies that simultaneously improve cancer treatment outcomes and cardiovascular health. Our representative work has been published in Nature Biomedical Engineering, Nature Communications (2), Advanced Materials (2), and Advanced Science.



# Xiaoxiang Yan

**Ruijin Hospital, Shanghai Jiao Tong University School of Medicine Department of cardiovascular medicine**

## PRESENTATION TITLE

**Epigenetic editing for the treatment of cardiopulmonary fibrosis**

## BIOGRAPHY

Professor Xiaoxiang Yan is a Professor in the Department of Cardiology at Ruijin Hospital, Shanghai Jiao Tong University School of Medicine. He also serves as Director of the Office of Achievement Transformation at Shanghai Jiao Tong University School of Medicine.

His research focuses on inflammation, immune regulation, myocardial injury, and cardiac remodeling after acute myocardial infarction, with an emphasis on identifying novel mechanisms and translational strategies for cardiovascular protection. He has led multiple competitive research programs, including the National Science Fund for Distinguished Young Scholars and the Excellent Young Scientists Fund of the National Natural Science Foundation of China. Professor Yan has published more than 40 SCI-indexed papers, including work in leading journals such as Circulation, Circulation Research, Science Advances, and Science Signaling. His achievements have been recognized by honors including the China Youth Science and Technology Award.



# Xiang Gao

Sichuan University

## PRESENTATION TITLE

**Non-viral vector-mediated tumor immunotherapy**

## BIOGRAPHY

Xiang Gao has been engaged in research on the fabrication of self-assembled gene and drug delivery vectors and tumor therapy. He has published over 30 articles in journals including Signal Transduction and Targeted Therapy, which have been cited by journals such as Nature Reviews Drug Discovery and Nature Reviews Disease Primers. As principal investigator, he has led multiple projects, including subprojects of the National Key R&D Program, the Excellent Young Scientists Fund of the National Natural Science Foundation of China, and General Program projects of the National Natural Science Foundation of China. As a core project and technical member, he has participated in National Major Science and Technology Projects and the Key Special Project for Inter-governmental International Science and Technology Innovation Cooperation under the National Key R&D Program.



# Yang Zhu

Zhejiang University

## PRESENTATION TITLE

**Quantitative analysis of biological effects of cardiac repair biomaterials**

## BIOGRAPHY

Associate Professor, Zhejiang University; Research Fellow, State Key Laboratory of Tansvascular Implantion Devices. His research focuses on biomedical polymers and the development of cardiovascular medical devices. He has presided over National and Zhejiang Provincial Key R&D Programs. His research findings have been published in journals such as Nature Biomedical Engineering. He holds more than 20 invention patents in the fields of biomedical materials and medical devices.

## ABSTRACT

Aiming at pathological alterations of chemical, electrical and mechanical factors in the myocardial microenvironment after myocardial infarction, corresponding cardiac patches and injectable hydrogels are developed to regulate the myocardial microenvironment. Combined with CNN, PINN, finite element analysis and other approaches, the chemical, electrical and mechanical effects of the materials are quantitatively characterized. Multi-omics analysis further elucidates the molecular mechanisms activated or suppressed by the materials during microenvironment remodeling.




# Xuefeng Qiu

**Humatrix Medical Technology (Suzhou) Co., Ltd**


## PRESENTATION TITLE

**First-in-man feasibility study of a decellularized biologic graft (LineMatrix®) for hemodialysis access: 12-month results**

## BIOGRAPHY

Dr. Xuefeng Qiu is the CEO and Founder of Humatrix, and he is also a Professor, Attending Surgeon in the Department of Cardiovascular Surgery at Union Hospital, Tongji Medical Collage, Huazhong University of Science and Technology. He was a postdoctoral fellow at the Department of Bioengineering, University of California, Berkeley, a Clinical Fellow at the California Institute for Regenerative Medicine (CIRM), and a project researcher at the Department of Bioengineering at UCLA. Dr. Qiu specializes in cardiovascular surgery, as well as clinical translation of tissue-engineered vascular grafts. He started up Humatrix in Suzhou Industrial Park on Sept. 1, 2021. Now the core pipeline product LineMatrix® graft has completed the enrollment for clinical trials.

## ABSTRACT


INTRODUCTION

To evaluate the early safety and efficacy of LineMatrix®, a decellularized biologic bovine carotid artery graft, for arteriovenous graft (AVG) creation in chronic hemodialysis patients.

METHODS

This prospective, single-center, single-arm first-in-man study (ChiCTR 2500106717) enrolled 12 patients with end-stage renal disease (ESRD) that are unsuitable for autologous fistula creation. LineMatrix® (6 mm×40 cm) grafts were implanted in the upper limb. The primary endpoint was primary patency at 3 months. Secondary endpoints included primary and cumulative patency rates at 3, 6, and 12 months, time to first cannulation, and safety outcomes.

RESULTS

Twelve grafts were successfully implanted. Two patients were excluded from efficacy analysis (one graft explantation for a non-device-related infection at day 29, one withdrawal of consent at day 89). In the per-protocol cohort (Fig 1, n=10), primary and cumulative patency rates were 90% and 100% at 3 months, and 80% and 100% at 6 months, respectively. These rates remained high at 12 months (70% and 100%, respectively).

The intervention rate for LineMatrix® was 0.4 per patient-year, significantly lower than historical benchmarks for ePTFE grafts (approximately 3.3 per patient-year in historical cohorts). Three thromboses (days 37, 88 and 139) were attributed to anastomotic stenosis, requiring interventions to restore patency. One patient was found with venous anastomosis neoinitmal hyperplasia at day 258 and treated by percutaneous transluminal angioplasty.

No graft-related infections, steal syndrome, cardiac failure, aneurysm, pseudoaneurysm, or seroma were observed during follow-up. This overall enhanced clinical performance may be attributed to maintaince of the extracellular matrix (ECM) integrity within the vessel wall, thereby promoting host cells re-endothelialization and recellularization.

Fig. 1 – Kaplan-Meier curve showing primary and cumulative graft patency (PPS).

CONCLUSION

These preliminary outcomes demonstrate LineMatrix® grafts may provide durable and functional hemodialysis access for patients with end-stage renal disease.







# Yuan Zhao

**Sunna Technologies (Shanghai) Co., Ltd.**


## PRESENTATION TITLE

**Early-Cannulation and Anticoagulating Small-Diamter Vascular Graft**

## BIOGRAPHY

Dr. Zhao obtained his doctoral degree in Materials Science and Engineering, after which he entered the medical device industry. He has engaged in cutting-edge product research and development at several domestic and international medical device companies, accumulating solid hands-on experience throughout his career.

Currently , Dr. Zhao serves as Senior R&D Director at Sunna Technologies. He has years of professional experience across multiple core fields, including innovative translation and commercial application of medical device, implantable and interventional medical devices, surface chemistry and coating processes, nanomaterial synthesis and characterization, and advanced manufacturing technologies.

## ABSTRACT


In China, the market for small-diameter vascular grafts (inner diameter ≤ 6 mm) used in hemodialysis is dominated by imported products. These existing commercial grafts are plagued by numerous defects and critical clinical challenges, including poor puncture resistance, a long post-implantation maturation period, a high incidence of thrombosis and vascular stenosis, a risk of dissection bleeding and pseudoaneurysm formation, short service life, unstable supply, and exorbitant costs that impose a heavy financial burden on patients.

The heparin-coated small-diameter vascular graft independently developed by Sunna integrates a biomimetic three-layered structure with anticoagulant drugs via electrospinning technology. It exhibits outstanding properties such as excellent puncture resistance, rapid maturation enabling immediate puncture (within 24H after implantation), and superior antithrombogenicity. This innovation not only achieves successful domestic substitution but also elevates the performance of such products to a new benchmark. Furthermore, it offers a significant cost advantage over imported counterparts. Upon commercialization, this advanced vascular graft is poised to benefit millions of hemodialysis patients.




# Zhenchuan Miao

**Beijing Vitalstar Biotechnology Co. Ltd.**


## PRESENTATION TITLE

**Humanized Immune Reconstitution Mouse Models: Characteristics, Applications and Improvements**

## BIOGRAPHY

Dr. Zhenchuan Miao Obtained a Ph.D. in Cell Biology from Institute of Zoology, Chinese Academy of Sciences, and Completed his postdoctoral research at York University, Canada and Peking University. He Joined Beijing Vitalstar Company in 2012. As director of R&D, he led the development of NPG, one of China's earliest highly immunodeficient mouse strains. He also directed the development of multiple humanized immune system mouse models, humanized liver mouse models, and hepatitis B mouse models. He helped the construction of the company's new drug in vivo efficacy study platforms by using genetically engineered mice and rats, completing many preclinical evaluation projects for anti-hepatitis B and anti-tumor drugs.

## ABSTRACT

Transplantation of human hematopoietic stem cells (HSCs) or peripheral blood mononuclear cells (PBMCs) into immunodeficient mice enables the reconstitution of a human immune system in mice , as indicated by the generation of various human hematopoietic and immune cell lineages and the detection of human immunoglobulins in serum, although not fully comparable to humans. Humanized immune system mouse models are widely applied in the establishment of hepatotropic viral infection models (e.g., HIV, EBV, CMV), evaluation of immunomodulatory agents such as immune checkpoint inhibitors/ agonists and T-cell engager therapies, investigation of tumor immune microenvironments, assessment of cytokine release syndrome (CRS), development of in vivo CAR-T therapies, study of drug-induced toxicities on hematopoietic systems, bone marrow transplantation research, and studies of hematopoietic and immune system development. However, first-generation humanized immune system mouse models still exhibit numerous functional deficiencies, including graft-versus-host disease (GvHD), limited stable periods, poor development of human NK cells and myeloid cells, altered T-cell receptor MHC restriction, and impaired B-cell functionality. These limitations that compromise the functions of the humanized immune system are currently being addressed through genetic engineering of the recipient mice used for human immune system engraftment.






# Dong Gao

**Shanghai Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences**


## PRESENTATION TITLE

**$KRAS^{G12D}$ targeted therapy sensitivity depends on interferon signaling activation in pancreatic cancer**

## BIOGRAPHY

Dong earned his Ph.D. in Cell Biology from Peking University, Beijing, China, in 2011. Following this, he became a postdoctoral fellow at Memorial Sloan Kettering Cancer Center, New York. In 2016, Dong joined the Shanghai Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences, as a Principal Investigator. His research group focuses on three main research directions: 1) defining the roles of adult stem cells and identifying the mechanism of their cell fates determination in cancer initiation; 2) defining the pioneering forces shaping cell lineage plasticity during cancer progression and therapeutic resistance; 3) generating patients-derived organoid models and developing potential therapeutic strategies. Through these works, we have the potential to deeply characterize adult stem cells in cancer initiation, understand cell lineage plasticity during cancer progression and therapeutic resistance, and develop potential therapeutic strategies.

## ABSTRACT

$KRAS^{G12D}$ is a predominant driver in pancreatic cancer, yet the basis of intrinsic resistance to $KRAS^{G12D}$-targeted therapy remains poorly defined. Multi-omics profiling (genomics, transcriptomics, and proteomics) across 234 patient-derived organoids and matched tumor tissues revealed an intrinsic resistant $KRAS^{G12D}$-mutant subset to $KRAS^{G12D}$-targeted therapeutics, characterized by marked downregulation of innate immune signaling pathways. Functional validation demonstrated that suppressing interferon signaling in sensitive models induced resistance, whereas activation of interferon signaling, particularly IFN-β, increased sensitivity in resistant models. Combining IFN-β with KRAS inhibitors (MRTX1133, HRS-4642, and RMC-6236) exhibited synergistic antitumor effects in intrinsically resistant pancreatic cancer. Mechanistically, sustained MYC activity was associated with attenuated sensitivity to KRAS inhibition and correlated with repressed interferon signaling, suggesting a potential role in promoting intrinsic resistance. These findings identify interferon signaling as a candidate determinant of KRAS-targeted therapy response and support interferon-based combinations as a potential strategy for intrinsically resistant pancreatic cancer.



# Weiqi Zhang

**Beijing Institute of Genomics, Chinese Academy of Sciences / China National Center for Bioinformation**

## PRESENTATION TITLE

**Deciphering Aging Mechanisms and Developing Interventions Based on Aging Clocks**

## BIOGRAPHY

Dr. Weiqi Zhang is a Principal Investigator at the China National Center for Bioinformation, and a Professor and Doctoral Supervisor at the School of Medicine, University of Chinese Academy of Sciences. She received the National Science Fund for Excellent Young Scholars and is an Outstanding Young Scholar Awardee of the Beijing Natural Science Foundation. She serves as the Chief Scientist of a National Key R&D Program of China and has received honors including the Zhong Nanshan Youth Innovation Award and the Outstanding Young Investigator Award in Stem Cell Research. Her research focuses on aging and aging-related diseases. She currently serves as Vice Chairperson of the Anti-Aging Branch of the China Association of Gerontology and Geriatrics. As corresponding or co-corresponding author, she has published dozens of papers in journals such as Cell and Nature, and has been consecutively listed among the “World’s Top 2% Scientists”. Her research achievements have been repeatedly selected among the “Top 10 Scientific Advances in China” and the “Top 10 Advances in Life Sciences in China.”

## ABSTRACT

Our research established a three-dimensional integrated aging research system combining human stem cells and organoids, non-human primates, and population cohorts. It systematically revealed the core mechanisms by which epigenetic regulation and immune-metabolic interactions drive aging in major organs (e.g., the cardiovascular system), leading to the development of novel intervention strategies. A multi-omics database cluster for aging was also constructed, facilitating the development of AI models for aging assessment, target discovery, and innovative interventions. Furthermore, the study systematically characterized biomarkers of multi-organ aging, established multi-organ aging clocks and immune clocks in both non-human primates and humans, and released a multidimensional aging clock system for the Chinese population.





# Yugang Guo

**Zhejiang University**

## PRESENTATION TITLE

**Metabolically Armored CAR-T: From Bench to Bedside**

## BIOGRAPHY

Dr. Yugang Guo is a Principal Investigator and Doctoral Supervisor at the College of Pharmaceutical Sciences, Zhejiang University. He is a National High-Level Young Talent and leads a disruptive technology innovation project under the National Key R&D Program. His research focuses on T cell differentiation and metabolic regulation. By applying immunometabolic reprogramming, he has overcome the challenge of T cell exhaustion in immunotherapy. He has developed a series of exhaustion resistant immunomodulators (Nature Immunology 2021; Nature 2024), metabolically armored CAR-T cell therapy (Nature Biotechnology 2024), and CD19 CAR-T treatments for hematologic malignancies (Blood 2024; Lancet Hematology 2025; JAMA Oncology 2026), demonstrating significant translational potential for novel drug development. Dr. Guo has filed over 20 invention patents, including 11 granted Chinese patents, 5 PCT international patents, and 3 transferred or licensed to enterprises. Multiple drug candidates from his research have advanced into clinical trials.

## ABSTRACT

This talk will present a metabolicarmored CART platform that tackles Tcell exhaustion—a key barrier in cancer immunotherapy. Current CART therapies suffer from limited efficacy and high costs, largely due to exhaustion. He and collaborators discovered that IL10 and IL4 directly reinvigorate terminally exhausted T cells via metabolic reprogramming. IL10 enhances OXPHOS through the MPC pathway, restoring proliferation, cytotoxicity, and stemlike memory. Preclinically, metabolically armored IL10 CART raised cure rates from 0% to 90% in solid tumors in preclinical studies. In clinical studies, the CD19targeted IL-10 CART achieved 100% complete response in the first cohort of over 20 patients with relapsed/refractory Bcell malignancies using ultra-low doses. It also showed efficacy in SLE without lymphodepletion, minimizing side effects and hospital stays.



# Sida Shao

**Westlake University**

## PRESENTATION TITLE

**Chemical Decoding of Tissue Regeneration**

## BIOGRAPHY

Dr. Sida Shao was born in 1990 in Tianjin, China. He received his B.S. degree in Biological Sciences from Peking University in 2013 under the guidance of Dr. Hongkui Deng with a focus on somatic cell reprogramming. Dr. Shao obtained his Ph.D. degree in Chemical Biology in 2019 from the Scripps Research Institute under the supervision of Dr. Peter G. Schultz. Following graduation, he joined Calibr, the translational research division of Scripps Research, as a Principal Investigator, developing novel small molecules for alveolar regeneration. His past research culminated with a preclinical candidate for regenerative lung repair, which will enter a first-in-human study in 2024. Dr. Sida Shao joined Westlake University as an assistant professor in August 2023. His research resides at the interface of chemistry and stem cell biology, focusing on applying and developing novel chemical tools to study tissue regeneration.

## ABSTRACT

Aberrant function and fate in tissue stem cells is a major driver of aging and of many degenerative diseases. Chemical tools that can steer these cells with precision could reshape how we understand tissue regeneration and open a path toward clinical translation. Working from this premise, we discovered and optimized CMR316 (NCT06589219), a clinical-stage small-molecule drug that drives alveolar epithelial regeneration, as a treatment for idiopathic pulmonary fibrosis, with Phase 2 trial set to begin in 2027. Phenotypic drug discovery, however, remains difficult to scale in practice. To overcome this, we reframed phenotypic screening as a computational problem, using artificial intelligence to learn how molecular structure maps onto shifts in stem cell phenotype across an essentially limitless chemical space. Building on this idea, we developed GEMGen, a large language model that generates candidate molecules directly from a desired phenotype. Molecules produced this way showed strong anti-fibrotic activity in both cell and animal models, demonstrating a broadly applicable route to phenotype-driven drug discovery for regenerative medicine.





# Liuliu Yang

**Institute of Hematology, Chinese Academy of Medical Sciences**

## PRESENTATION TITLE

**Human Pluripotent Stem Cell-Derived Complex Organoid Models for Disease Modeling and Drug Discovery**

## BIOGRAPHY

Prof. Liuliu Yang is a principal investigator specializing in stem cell biology, organoid-based disease modeling, and drug discovery. Her research focuses on the generation of human pluripotent stem cell-derived organoids, immune cells, and vascularized immunocompetent organoid models. These platforms are used to investigate viral infection, immune–tissue interactions, and disease-associated molecular mechanisms, as well as to support high-throughput drug screening.

Her work has also advanced the understanding of pluripotent stem cell self-renewal and immune cell lineage development. She has published as a first or corresponding author, including co-authorship, in leading journals such as Nature, Cell Stem Cell, Nature Methods, and Nature Immunology, with several papers recognized as highly cited publications.

Prof. Yang currently leads multiple nationally and regionally funded research projects, including programs supported by the National Natural Science Foundation of China and the National Key Research and Development Program of China.

## ABSTRACT

Human pluripotent stem cells possess unlimited self-renewal capacity and the potential to differentiate into multiple cell lineages, making them a powerful platform for generating functional organoids to study human development and disease. Meanwhile, the establishment of immune cell lineages is essential for maintaining physiological homeostasis and mounting effective responses against infections and tumors.

We have developed a range of human pluripotent stem cell-derived tissue cells and organoid models representing all three germ layers. These models have been used to investigate virus-induced tissue damage and to identify candidate antiviral compounds through drug screening. We have also developed immunocompetent organoid models that recapitulate immune cell-mediated tissue damage, enabling mechanistic investigation of immune–tissue interactions and the identification of compounds that mitigate inflammation-induced injury. Furthermore, we have generated vascularized and immunocompetent organoid models to investigate the roles of vascular endothelial cells and immune cells in organ development, tissue homeostasis, and disease progression.

Together, these complex organoid systems provide physiologically relevant platforms for studying human disease mechanisms and facilitating therapeutic drug discovery.



# Min Luo

**Fudan University**

## PRESENTATION TITLE

**CD300ld/ld-L orchestrates neutrophil state transition in cancer**

## BIOGRAPHY

Prof. Min Luo serves as a Principle Investigator at Institutes of Biomedical Sciences, Fudan University, from 2018. She obtained her B.S and Ph.D. degrees from the School of Life Sciences at Peking University, and worked in UT Southwestern Medical Center on cancer vaccine development from 2013-2018. With over 12 years of onco-immunology experience, she focuses on novel immunotherapy targets, drug strategies, and clinical translation. Key work includes: 1) discovering a novel immunosuppressive receptor CD300ld on tumor associated neutrophils that plays key role in tumor progression and immune evasion; 2) establishing a genome-wide receptor-ligand screening system to decode orphan receptors/ligands; 3) developing a STING activating nanovaccine that advanced to Phase I trials for solid tumor treatment. She holds 3 Chinese patents, 2 PCT patents, and has published as corresponding author in journals such as Nature, Cell research, Nature Communications, Journal For Immunotherapy of Cancer and so on.

## ABSTRACT

Neutrophils adopt an immune-suppressive state upon tumour education, playing critical roles in cancer progression and immune evasion. However, the molecular mechanism driving this phenotypic transition remains elusive. We previously identified that CD300ld, an orphan receptor predominantly expressed on neutrophils, is required for tumor-driven immune suppression. Here we performed an unbiased genome-wide ligand screening and identified ld-L as the functional ligand for CD300ld that controls neutrophil state transitions. ld-L stimulates neutrophil migration and their T-cell suppressive capacity in a CD300ld-dependent manner. Notably, a point mutation in CD300ld completely abolished its binding to ld-L. Deficiency of ld-L-CD300ld engagement markedly reduces neutrophil infiltration and immunosuppressive activity, leading to significant tumor inhibition across multiple spontaneous and syngeneic tumor models. Mechanistically, ld-L-CD300ld engagement triggers robust interleukin-6 signaling in an autocrine manner, initiating neutrophil transition into an immunosuppressive state. ld-L is upregulated in multiple human cancer types and shows strong correlations with neutrophil infiltration and poor clinical outcomes. Ablation of ld-L-CD300ld interaction significantly reduces neutrophil recruitment and T-cell suppression, achieving robust anti-tumor effects and synergizing with PD-1 blockade. Collectively, our findings reveal a critical tumor–neutrophil communication axis and underscore the therapeutic potential of targeting ld-L-CD300ld signaling in cancer immunotherapy.





# Donghui Zhang

**Hubei University**

## PRESENTATION TITLE

**Organoid Engineering and Disease Models**

## BIOGRAPHY

Donghui Zhang is the Vice President, Professor, and Doctoral Supervisor at Hubei University. She also serves on the Calcium Signaling Subcommittee of the Biophysical Society of China and the Organoid and Organ-on-a-Chip Subcommittee of the Chinese Society of Biomedical Engineering. Her research focuses on human iPSC-derived cardiomyocytes, constructing cardiac organoids and engineered myocardial tissues to study cardiomyopathy mechanisms and develop therapies for myocardial infarction, arrhythmia, and heart failure. She has published over 40 SCI papers in journals such as Circulation, Circulation Research, Nature Communications, Cell Discovery, Biomaterials, Cell Research, and Nature Reviews Cardiology, with over 4,000 Google Scholar citations. She has been selected for multiple national and provincial high-level talent programs and, as principal investigator, leads a major research plan project and several general projects of the National Natural Science Foundation of China.

## ABSTRACT

The research team led by Prof. Donghui Zhang focuses on advancing cardiac organoid-based disease modeling and standardized pharmacodynamic evaluation. Their work addresses three pivotal scientific challenges: optimizing the derivation of functional cardiomyocytes, constructing biomimetic architectures with integrated functional assays, and establishing multi-tiered disease models in conjunction with multi-organ assembled organoids.

Methodologically, the team utilizes human pluripotent stem cells (hPSCs) and expanded pluripotent stem cells (EPSCs) to achieve robust, large-scale cardiomyocyte production via directed differentiation. To recapitulate native myocardial microenvironments, they have developed cardiac organoids with anisotropic cellular alignment and subjected them to mechanical conditioning regimens, which are critical for structural and functional maturation. Furthermore, they have established a quantitative, multi-parametric functional evaluation system that measures contractility, calcium handling, and electrophysiological parameters—directly mirroring clinical diagnostic indices.

Capitalizing on these platforms, they have successfully constructed disease models recapitulating inherited arrhythmogenic syndromes, including Catecholaminergic Polymorphic Ventricular Tachycardia (CPVT) and Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC), alongside models for diabetic cardiomyopathy and myocardial injury repair. These models have been instrumental in validating the efficacy of small-molecule compounds and novel gene therapy strategies.

Moving beyond single-tissue models, the team is pioneering assembloids that integrate myocardial-valvular and cardiac-vascular interactions to simulate complex, systemic pathophysiological processes, thereby offering deeper insights into disease progression and inter-organ crosstalk.

Collectively, this comprehensive research provides a novel mesoscale toolset that bridges in vitro organoid technology with preclinical applications. It offers a robust, standardized platform for high-throughput drug screening, predictive cardiotoxicity assessment, and the advancement of precision medicine, holding significant translational potential for personalized therapeutic interventions.




# Xiao Li

**Xi'an Jiaotong University**


## PRESENTATION TITLE

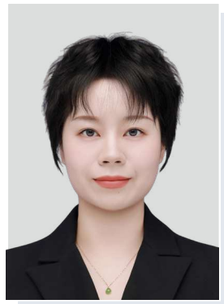
**Development of micro/nanoscale sensing structures for biomedical applications**

## BIOGRAPHY

Dr. Xiao Li is a Professor in the School of Mechanical Engineering at Xi'an Jiaotong University. He received his Ph.D. in Mechanical Engineering from McGill University in 2016 and completed his postdoctoral work at Stanford University in 2021. His research focuses on biosensing technology at the micro/nanoscale, involving the development of fabrication techniques for biosensing structures and the investigation of underpinning mechanisms for cell–structure interactions. So far, he has published more than 40 articles in such journals as Nature Protocols, Advanced Materials, Progress in Materials Science, Nano Letters, and Biosensors and Bioelectronics.

## ABSTRACT

Micro/nanoscale sensing structures with refined morphologies and tailored functionalities have exhibited significant advantages in elucidating biological mechanisms and facilitating medical detection, establishing themselves as a cornerstone technology driving innovations in the biomedical field. Unlocking their full potential for translational biomedical applications hinges on achieving high-quality, controllable construction of these intricate architectures at the micro/nanoscale. Here we report the research progress of our group in the development of micro/nanoscale sensing structures for biomedical applications, highlighting the optimization of structural construction processes and the systematic improvement of key sensing performance metrics. Furthermore, applications of the developed structures are demonstrated to meet diverse demands in the biomedical field.




# Yang Yang

**Nanjing Medical University**


## PRESENTATION TITLE

**Application of Blood Vessel Organoids in Deciphering the Mechanism of Toxoplasma-Induced Vascular Damage**

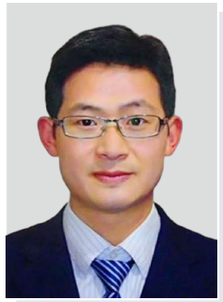
## BIOGRAPHY

Yang Yang received her Ph.D. in Cell Biology from Peking University in 2016, supervised by Professor Deng Hongkui. Since 2018, she has been a Principal Investigator and Ph.D. supervisor at the Key Laboratory of Reproductive Medicine and Offspring Health, Nanjing Medical University. She has been selected for the Jiangsu Province Six Talent Peaks Program (Category A), the Double Innovation Talent Program, and the 333 Project (Third Level), and serves on the Organoid and Organ-on-a-Chip Toxicology Committee of the Chinese Society of Toxicology.

Her research uses hPSC-derived organoids to investigate adverse pregnancy outcomes linked to prenatal exposures. She develops embryo-like and implantation models to study embryonic development, and creates vascular, cardiac, and placental organoids to explore cardiovascular and placental diseases. As first/corresponding author, she has published in Cell, Autophagy, ACS Nano, and Advanced Science, holding one PCT and three Chinese invention patents.

## ABSTRACT

Human pluripotent stem cell–derived vascular organoids (VOs), as a cutting-edge 3D in vitro model, provide a highly physiologically relevant platform for elucidating complex vascular pathological mechanisms. In this talk, we will use this model to explore its application in pathogen infection–associated vascular injury. We focus on a long-standing unresolved question: is "pathogen-derived antigen" alone sufficient to drive vascular damage during the post-infection stage? We will present how Toxoplasma gondii soluble tachyzoite antigen (STAg) directly disrupts vascular integrity by upregulating the endothelial scavenger receptor CD36, thereby reprogramming endothelial cells toward a scavenger endothelium–like phenotype. This transition enhances cellular uptake of STAg, leading to dysfunction of the autophagy–lysosome pathway (ALP) and ultimately impairing vascular homeostasis. Meanwhile, we explore drug repurposing and show that folate (FA) can inhibit CD36 expression, limit STAg uptake, and alleviate excessive ALP activation, providing an actionable CD36–ALP therapeutic axis and a potential preventive strategy for infection-related vasculopathy.



# Yong Zhang

**Shanghai Hinata Biotechnology Co., Ltd.**

## PRESENTATION TITLE

**Illuminating a Full-Dimensional View of Innovative Drug Research: Revvity Fluorescent Probe Labeling and In Vivo Imaging System (IVIS)**

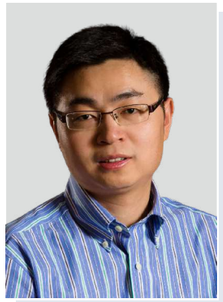
## BIOGRAPHY

Yong Zhang, Chief Technology Officer at Hinata Biotech Co., holds a master's degree in Tumor Molecular Biology from the Academy of Military Medical Sciences. He conducted research at the Institute for Nutritional Sciences, Shanghai Institutes for Biological Sciences, CAS, and has served as Study Director at the Nanjing Immunophage Translational Medicine Platform, IVIS Application Scientist at PerkinElmer, and Researcher at GSK. With over 10 years of experience in in vivo efficacy model development, he specializes in oncology efficacy evaluation and translational medicine. At Hinata, he established a PDX/PDOX orthotopic tumor evaluation platform integrated with IVIS imaging and fluorescent probe technologies and extended its application to inflammatory disease models.

## ABSTRACT

In the deep waters of innovative drug R&D, conventional techniques often fail to capture the real-time dynamic fate of therapeutics in living organisms. The combination of the Revvity IVIS LT in vivo imaging system and intelligent fluorescent probes offers a breakthrough solution, providing high-sensitivity, multi-channel, non-invasive imaging with a full-dimensional view. This approach enables real-time visualization of critical processes including drug targeted delivery, tumor immune microenvironment remodeling, and pharmacokinetic changes. This presentation introduces Revvity's fluorescent probe portfolio and comprehensive in vivo imaging solutions, with practical applications across preclinical scenarios from oncology to inflammatory and metabolic disease models, covering subcutaneous and orthotopic implantation strategies and long-term longitudinal studies.





# Cunjiang Yu

**University of Illinois Urbana-Champaign**

## PRESENTATION TITLE

**Drawn-on-Skin Bioelectronics for High-Fidelity Health Monitoring**

## BIOGRAPHY

Dr. Cunjiang Yu is the Founder Professor at the University of Illinois Urbana-Champaign in the Department of Electrical and Computer Engineering, with affiliated appointments in Departments of Materials Science and Engineering, of Mechanical Science and Engineering, and of Bioengineering. He received his PhD in Mechanical Engineering from Arizona State University and completed postdoctoral training in Materials Science and Engineering at the University of Illinois Urbana-Champaign. His research focuses on the fundamentals and translational applications of soft and bio electronics. His work has been recognized with numerous distinctions, including the IEEE Nanotechnology Council Technical Achievement Award, ASME Materials Division Centennial Mid-Career Award, the ASME Thomas Hughes Young Investigator Award, the Society of Engineering Science Young Investigator Medal Award, the American Vacuum Society Young Investigator Award, the Office of Naval Research Young Investigator Award, the NSF CAREER Award, the NIH Trailblazer Award, and MIT Technology Review Innovators Under 35 China. He is an IEEE Nanotechnology Council Distinguished Lecturer and a Fellow of ASME and American Institute for Medical and Biological Engineering (AIMBE).

## ABSTRACT

Wearable bioelectronics have the potential to transform healthcare by enabling continuous physiological monitoring outside clinical settings. However, conventional skin-mounted devices often suffer from motion artifacts, poor skin conformity, and mechanical mismatch, limiting signal fidelity during daily activities. To address these challenges, we have developed drawn-on-skin electronics, a class of customizable, ultra-conformal electronic interfaces fabricated directly on the skin using biocompatible functional inks. This presentation will introduce the principles, materials and associated technologies and unique advantages of drawn-on-skin bioelectronics, followed by recent advances in their application to high-fidelity health monitoring. Representative examples include motion artifact-free electrophysiological sensing, fully biocompatible drawn-on-skin sensors for clinical-quality biosignal acquisition, and customizable high-density electromyography arrays for anatomically coordinated neuromuscular mapping and high fidelity neural interfaces. Together, these advances establish drawn-on-skin bioelectronics as a versatile platform for next-generation wearable health monitoring, personalized human-machine interfaces, and bioelectronic medicine, opening new opportunities for precision healthcare in both clinical and everyday settings.



# Bifeng Liu

**Huazhong University of Science and Technology**

## PRESENTATION TITLE

**Microfluidics towards exosomes detection and applications to cancer diagnosis**

## BIOGRAPHY

Dr. Bifeng Liu received his Ph.D. degree of analytical chemistry in 1999 from Wuhan University (China). He joined Huazhong University of Science and Technology, China as a professor in 2003. He is now serving as the Chairman of College of Life Science and Technology. His research focuses on Systems biomedicine and Engineering, particularly in microfluidics-based biomedical technologies including in-vitro diagnosis, exosomes, single cells and organoid etc. He is the author and co-author of over 240 original research papers and invited reviews published in international journals, such as Nature Chemistry, Nature Communications, Nature Protocols Advanced Materials and ACS Nano.

## ABSTRACT

Cancer is a leading cause of global mortality. Extracellular vesicles (EVs) play a crucial role in the occurrence and progression of cancer. In this presentation, we introduced our recent advancements on microfluidics-based EVs, new tools for EVs isolation, detection, and clinic diagnosis, prognosis, therapy as well. At first, we would discuss some our developed microfluidic-base methods for EVs analysis, and their applications for clinics, particularly with help of artificial intelligence. Then, clinical utilization of EVs as drug carriers for tumor therapy were investigated. We modified EVs by chemical modification and designed microfluidic chips and biomimetic particles for rapid and efficient isolation of EVs for tumor target and drugs delivery, which provides a new idea for the precise treatment of cancers. Finally, future prospective would be discussed.





# Gang Wang

**Donghua University**

## PRESENTATION TITLE

**Semiconductor Fibers and Textile Systems for Embodied Intelligence**

## BIOGRAPHY

Dr. Gang Wang is Vice Dean and Research Professor at the College of Materials Science and Engineering, Donghua University. He serves as a project leader under China's National Key Research and Development Program. He has received the National New-Era Young Pioneer Award and the Outstanding Contribution Award for Industry–Academia–Research Collaboration from HONOR, and was selected for the National Thousand Young Talents Program and Shanghai's "35 Under 35" Science and Technology Leadership Program.

Dr. Wang has published more than 60 peer-reviewed papers in leading journals, including Nature Materials, Proceedings of the National Academy of Sciences, Advanced Materials, and Chemical Reviews. He led the development of the first continuous manufacturing platform capable of producing semiconductor superstructured fibers at kilometer-per-minute speeds. He also spearheaded the establishment of the "Xingkong Laboratory," a major joint university–industry research platform. Three categories of textile electronic products developed by his team have been deployed in active healthcare, energy pipeline monitoring, and technology-enabled Olympic applications.

## ABSTRACT

With the advent of embodied intelligence, the demand for flexible and highly integrated hardware systems is becoming increasingly urgent. However, the conventional combination of flexible substrates and rigid chips continues to face fundamental limitations arising from poor conformability and pronounced physical boundaries. This study introduces a transformative fiber-as-circuit paradigm. Using our independently developed programmable microfluidic spinning technology, multichannel fluid flows are dynamically encoded in space and time to integrate multiple essential semiconductor functions within a single continuous fiber, including electroluminescent IC (EL-IC) fibers for light emission and display, resistor and capacitor IC (RC-IC) fibers for analog signal processing, organic electrochemical transistor IC (OECT-IC) fibers for digital logic operations, and electroquasistatic IC (EQS-IC) fibers for three-dimensional spatial sensing.

The resulting integrated circuit fibers (IC fibers) exhibit excellent stretchability and textile processability, enabling them to be woven into functional textile systems. At the system level, contactless, real-time three-dimensional gesture control of both a robotic arm and a physical unmanned aerial vehicle is successfully demonstrated. By tightly integrating sensing, computation, and actuation within a fiber-based architecture, this work provides a transformative hardware foundation for next-generation seamless human–machine interaction and wearable embodied intelligence.

Fig.1 Semiconductor Fibers and Textile Systems for Embodied Intelligence

References:

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Zhong Y., Liang Q., Chen Z., et al. Chem. Mater. 2023, 35, 9739.

Sun F., Jiang H., Wang H., et al. Chem. Rev. 2023, 123, 4693.




# Yannan Xie

**Nanjing University of Posts and Telecommunications**


## PRESENTATION TITLE

**Flexible Self-Powered Mechanical Sensors and Their Applications in Healthcare Monitoring**

## BIOGRAPHY

Professor Yannan Xie is the Associate Dean of the School of Materials Science and Engineering, Nanjing University of Posts and Telecommunications and Young Scholar of the Changjiang Scholars Program. His research interest focus on flexible self-powered sensors. He has published over 90 papers in journals such as Adv. Mater., Adv. Funct. Mater., ACS Nano, and Nano Lett., with more than 11,200 citations and an H-index of 47. He has filed over 30 invention patents and has been granted 14 Chinese invention patents and 1 U.S. invention patent.

## ABSTRACT

In recent years, wearable electronics have developed rapidly and hold broad application prospects in commercial, medical, military, and other fields. Conventional wearable sensors typically rely on battery power; however, batteries suffer from low power density and limited lifetime, which have become a technical bottleneck for rapid progress in this field. To address these issues, flexible energy harvesting technologies based on human body energy and their self-powered sensors have been proposed as an important alternative. This technology originates from Maxwell's displacement current and can effectively convert environmental signals into electrical signals without the need for an external power supply, thereby enabling self-powered sensing. In this context, we will first introduce the design of flexible self-powered mechanical sensors from aspects such as device working principles, structural design, and material preparation. Then, we will design signal conditioning circuits based on the electrical signal characteristics to achieve a high signal-to-noise ratio, as well as fabricate wireless signal transmission circuits for real-time transmission of the detected signals. At the signal receiving end, we analyze and process the detected signals using machine learning to enable real-time visual display of the detection results. Finally, we will discuss the applications of the above sensing systems in the field of healthcare monitoring, such as real-time lung function monitoring and gait recognition.




# Zhihao Zhou

**Chongqing University of Posts and Telecommunications**


## PRESENTATION TITLE

**Sensing Mechanisms and Devices of Flexible Force Sensors**

## BIOGRAPHY

Zhihao Zhou is an Associate Professor and doctoral supervisor specializing in flexible sensing technologies and wearable intelligent sensing systems. He has been selected for several prestigious talent programs, including the Young Elite Scientists Sponsorship Program of the China Association for Science and Technology, the Hong Kong Scholars Program, and the Chongqing Science Fund for Distinguished Young Scholars. He is a recipient of the Young Scientist Award from the China Instrument and Control Society and the Second Prize of the Chongqing Natural Science Award. As principal investigator, he has led ten national and provincial-level research projects. He has published more than 30 papers in leading international journals, including Nature Electronics and Science Advances, and his work has received over 3,000 citations.

## ABSTRACT

Flexible force sensors offer advantages such as lightweight construction, mechanical compliance, and conformability to complex curved surfaces, demonstrating broad application potential in wearable health monitoring, embodied intelligence, and equipment condition monitoring. However, simultaneously achieving high sensitivity, a wide detection range, and long-term stability remains a major challenge. This presentation focuses on the sensing mechanisms and device design of flexible force sensors, highlighting recent advances in force-sensing interface engineering, device structure optimization, sensor array development, and system integration. Through representative application scenarios, the presentation elucidates the synergistic roles of material design, structural engineering, device fabrication, and signal processing in enhancing sensing performance and system-level capabilities. The presentation concludes with an outlook on the future development of flexible force-sensing technologies.



# Shiming Zhang

The University of Hong Kong

## PRESENTATION TITLE

**From 2D planar electronics to 3D gel electronics: The rise of π-conjugated hydrogel semiconductors and transistors**

## BIOGRAPHY

Dr. Shiming Zhang is an Assistant Professor of Bioelectronics at HKU Electrical and Electronic Engineering and an affiliated faculty member at HKU SBME, where he leads the Wearable, Intelligent, and Soft Electronics (WISE) research group. He earned his PhD with the highest honor in Canada as a Vanier Canada Scholar from Ecole Polytechnique, Universite de Montreal. He spent three years at UCLA as a postdoctoral scholar and group leader in the Center for Minimally Invasive Therapeutics in bioelectronics and was promoted to an affiliated faculty member at the Terasaki Institute before moving to Hong Kong. His research focuses on the scientific understanding of charge transport in emerging mixed ion-electron conducting materials and on designing new mixed-conducting, tissue-compatible devices for broad bioelectronic applications, including soft electronics, biosensors, and biocomputing.

## ABSTRACT

Solid-state silicon transistors have revolutionized technology, yet integrating them with living systems remains challenging due to mechanical mismatches and charge carrier differences. Recent advances in hydrogels have led to hydrogel transistors, which combine the adaptability of hydrogels with transistor functionality, addressing these integration barriers. This talk highlights the fabrication, characterization, and biomimetic features of hydrogel transistors, emphasizing their potential to evolve beyond conventional 2D thin-film electronics into 3D gel-based platforms. Finally, it is illustrated how hydrogel-based semiconductor devices can bridge the technological gap, enabling a deeper understanding of biological processes in real time and paving the way for next-generation soft electronics, wearable healthcare solutions, implantable medical devices, and more.





# Jun Chen

University of California, Los Angeles

## PRESENTATION TITLE

**Discovering Magnetoelasticity in Soft Matter for Bioelectronics**

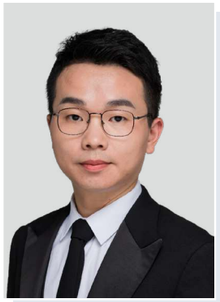
## BIOGRAPHY

Dr. Jun Chen is currently an associate professor in the Department of Bioengineering at the University of California, Los Angeles. His research focuses on soft matter innovation for healthcare and energy. He has published two books and 430 journal articles, with 330 of them being corresponding authors in Nature Review Bioengineering (3), Nature Materials (4), Nature Electronics (10), Nature Biotechnology (2), Nature Chemical Engineering (2), Nature Nanotechnology(1), Nature Sensors (2), Nature Cardiovascular Research (1), Nature Biomedical Engineering (1), Nature Communications (10), Science Advances (6), Chemical Reviews (2), Chemical Society Reviews (2), among others. With a current h-index of 140, Dr. Chen was identified to be one of the world's most influential researchers in the field of Materials Science on the Web of Science. Among his many accolades are the V. M. Watanabe Excellence in Research Award (1 faculty per year in UCLA Samueli School of Engineering), ACS Nano Lectureship, MRS Outstanding Early Career Investigator Award, Hisako Terasaki Young Innovator Award, Stephanie L Kwolek Prize, Shu Chien Early Career Award, Asian American Academy of Science and Engineering (AAASE) Rising Star Award, ASME Rising Star of Mechanical Engineering, BMES CMBE Rising Star Award, UCLA Faculty Mentor Award, UCLA Society of Hellman Fellows Award, Georgia Tech Alumni 40 Under 40, ONR Young Investigator Award, AHA Innovative Project Award, AHA Transformational Project Award, AHA's Second Century Early Faculty Independence Award, NIH UCLA CTSI KL2 Translational Science Award, BBRF Young Investigator Award, Okawa Foundation Research Award, Advanced Materials Rising Star, Materials Today Rising Star Award, Chem. Soc. Rev. Emerging Investigator Award, Nano Research Young Innovator Award, ACS PMSE Young Investigator Award, among others. He is a Fellow of American Institute for Medical and Biological Engineering.

Beyond his research activities, Dr. Chen serves as the Executive Editor-in-Chief of Med-X, a section editor for Biosensors and Bioelectronics, and associate editors for VIEW Medicine, Soft Science, MRS Communications, FlexMat, Iontronics, cMat, and Textiles. Additionally, he is a member of the advisory and editorial boards of over 20 journals, including Matter, Materials Today, Materials Today Energy, Nano-Mirco Letters, Cell Reports Physical Science, The Innovation, Nano Trends, Biomedical Technology, among others.

## ABSTRACT

The magnetoelastic effect, also known as the Villari effect and first discovered in 1865 by the Italian experimental physicist Emilio Villari, refers to the change in a material's magnetic field under mechanical stress. Traditionally observed in rigid metals and metal alloys with external magnetic fields, it has been largely overlooked in soft bioelectronics due to limited magnetization under physiological stress, structural complexity, and extreme modulus mismatch with human tissues. In 2021, we reported the discovery of a giant magnetoelastic effect in a soft polymer system, and subsequently in a liquid permanent fluidic magnet. This breakthrough opens a fundamentally new pathway for developing intrinsically waterproof and biocompatible soft bioelectronics for diagnostics, therapeutics, and energy applications. Our UCLA team is pioneering the use of this effect to advance personalized healthcare and sustainable energy solutions.



# Kaichen Xu

**Zhejiang University**

## PRESENTATION TITLE

**Design and fabrication of in situ multifunctional sensing devices for myocardial injury repair**

## BIOGRAPHY

Kaichen Xu is a ZJU-100 professor at Zhejiang University. In 2018, he received the PhD degree from the National University of Singapore, and then moved to Osaka Prefecture University for postdoctoral research supported by JSPS program. His research focuses on design and fabrication of flexible electronics and applications in myocardial injury repair, humanoid robot perception and extreme high-temperature perception. Over 80 papers with more than 50 first/corresponding author papers were published on Nature Electronics, Nature Communications, Science Advances etc. He is the associate editor or editorial board member for International Journal of Extreme Manufacturing, Bio-Design Manufacturing and Opto-Electronic Engineering. He has reviewed over 400 manuscripts for more than 100 journals.

## ABSTRACT

Irreversible myocardial tissue injury and persistent cardiac dysfunction following myocardial infarction pose a severe threat to human life and health. Driven by the critical demands of precision medicine and tissue regeneration for cardiac diseases, there is an urgent need to develop bioelectronic hybrid systems integrated with long-term stable sensing, high-efficiency information communication and active therapeutic functions. Our team invented a fabrication technique for ultra-thin, flexible carbon-based sensitive thin films assisted by extreme energy fields; we proposed a novel strategy to boost the electrical conductivity of laser-induced conductive polymer networks; we engineered bioelectronic hybrid interfaces with mechanical properties dynamically matched to myocardial tissue, enabling continuous in-situ monitoring of electrical activity and tissue regeneration processes. Furthermore, we established an intelligent design framework empowered by active learning, which achieves inverse matching design of mechanical characteristics and sensing performance for bioelectronic devices under complex physiological environments. This research underpins the development of next-generation intelligent cardiovascular diagnosis and treatment devices capable of integrated continuous monitoring, precise diagnosis and regenerative therapy.



# Yunsheng Fang

**Xi'an Jiaotong University**

## PRESENTATION TITLE

**智能可穿戴生物医学超声设备**

## BIOGRAPHY

Yunsheng Fang is a Full Professor at the School of Life Science and Technology, Xi'an Jiaotong University, and an Adjunct Professor at the First Affiliated Hospital of Xi'an Jiaotong University. His research focuses on wearable ultrasound devices for personalized and precision medicine. He has published over 40 papers as first or corresponding author in journals including Advanced Materials, Chemical Society Reviews, ACS Nano, and Materials Today. His publications have received more than 5,300 citations with an H-index of 32, including eight ESI Highly Cited Papers and seven cover articles. He has filed 12 patents, five of which have been granted, led more than 10 research projects, and serves on the youth editorial boards of journals including The Innovation, SmartMat, Nano-Micro Letters, and Med-X.

## ABSTRACT

Current wearable monitoring devices mainly focus on capturing superficial bioelectrical, biophysical, and biochemical signals and lack continuous, visualized, high-resolution monitoring of deep tissues and internal organs. Ultrasound can noninvasively penetrate soft tissues, but conventional equipment is bulky and depends on liquid coupling gel. This report addresses key challenges in wearable biomedical ultrasound through integrated design of ultrasonic probes, solid coupling agents, and signal-processing circuits. It presents a high-performance probe with an optimized double-matching and air-backing structure, solid coupling agents with reversible adhesion, A-mode ultrasound excitation-receiving circuits, and a multi-channel imaging signal system. The work aims to establish an integrated chain spanning probes, coupling media, low-power circuits, signal transmission, and terminal applications for deep-tissue monitoring and noninvasive therapy.




# Weili Deng

**Southwest Jiaotong University**


## PRESENTATION TITLE

**Flexible Piezoelectric Devices for Healthcare Monitoring**

## BIOGRAPHY

Deng Weili, PhD, is an Associate Professor and a candidate for Sichuan Provincial Academic and Technical Leader. He has been recognized as an Overseas High-Level Talent of Sichuan Province, was a visiting scholar at UCLA and UC Riverside, and has been selected for the World's Top 2% Scientists List. His research focuses on nano-functional materials and flexible electronics, spanning material synthesis, property characterization, device construction, and applications. He has published more than 50 papers as first or corresponding author in journals including Nature Communications, Chemical Society Reviews, Advanced Materials, Advanced Functional Materials, Matter, ACS Nano, Nano-Micro Letters, and InfoMat. His work has received more than 11,000 Google Scholar citations.

## ABSTRACT

With the rapid advancement of flexible electronics and smart sensing technologies, the design and fabrication of high-performance piezoelectric fiber devices have emerged as a frontier research focus. This report focuses on the controllable construction and mechano-electrical coupling mechanisms of piezoelectric fiber devices. By integrating electrospinning with in-situ polarization, PVDF-based piezoelectric fibers with aligned, core-shell, and gradient architectures are fabricated, while crystallization behavior and piezoelectric phase content are optimized. Characterization and simulations clarify dipole deflection, charge transport, and the relationship between microstructure and macroscopic piezoelectric performance. The optimized devices are integrated into a smart sensing system for real-time monitoring of pulse, respiration, blood pressure, and joint movements.




# Yunze Cai

**Shanghai Jiao Tong University**


## PRESENTATION TITLE

**从交叉创新到全球传播：医工融合时代科研成果价值提升的新路径**

## BIOGRAPHY

蔡云泽，教授、博士生导师，上海交通大学期刊中心主任，担任上海市期刊协会副会长、上海市科技期刊学会副理事长、《海洋工程装备与技术》主编、《上海交通大学学报》中英文版执行主编。长期致力于塑造大信息、大健康、大海洋学术期刊品牌，引领学科发展并助力科学研究水平提升。主持或参与国家自然科学基金面上项目、国家重点基础研究发展计划、上海市基础研究重点项目及航空航天领域科研项目 50 余项，发表学术论文 100 余篇。曾获上海市自然科学三等奖、海南省自然科学一等奖、上海市科学技术三等奖等荣誉。

## ABSTRACT

医工交叉研究正处在学科深度融合与价值加速释放的关键阶段，然而高质量的研究成果能否真正产生广泛影响，取决于它能否被恰当的学术共同体所理解、接纳与转化。本报告以“从‘好研究’迈向‘高影响力’”为核心命题，探讨交叉学科成果在传播路径上面临的独特挑战。上海交通大学在全国率先探索期刊集群化发展路径，牵头组建医工交叉期刊联盟，为回应这些问题提供了系统性的实践样本。立足这一实践，报告旨在为推动更多医工交叉创新走向世界、提升我国交叉学科的国际学术话语权提供可借鉴的思路。



# Shanbao Tong

**Shanghai Jiao Tong University**

## PRESENTATION TITLE

**Why Papers Get Rejected? - Editor in Chief's Perspective**

## BIOGRAPHY

Dr. Shanbao Tong is a professor of biomedical engineering at Shanghai Jiao Tong University. He received his B.E. from Xi'an Jiaotong University in 1995, and his M.E. and Ph.D. from Shanghai Jiao Tong University in 1998 and 2002, respectively. He completed postdoctoral training in Biomedical Engineering at Johns Hopkins University from 2002 to 2005. His research interests include neural engineering, biomedical signal processing, laser speckle blood-flow imaging, stroke rehabilitation, and transcranial ultrasound neuromodulation. He has received several major academic and teaching awards, including the National Excellent Doctoral Dissertation Award and the First Prize of the Ministry of Education Natural Science Award. He is currently Editor-in-Chief of Medical & Biological Engineering & Computing, Theme Editor for Neuroengineering at IEEE EMBC, and Co-Executive Editor-in-Chief of Med-X.

## ABSTRACT

This presentation explains why biomedical engineering manuscripts are desk-rejected and how authors can prevent common, predictable problems before peer review. Drawing on editorial practice, it outlines 19 reasons across journal fit and contribution, writing and presentation, methodological rigor, AI/ML research, research ethics, and submission responsibility. Key concerns include poor alignment with journal scope, unclear clinical significance or novelty, weak language and formatting, underpowered studies, statistical misuse, and inadequate comparison with state-of-the-art methods. For AI/ML papers, particular emphasis is placed on subject-level validation, avoidance of data leakage, meaningful use of public datasets, interpretability, and transparent disclosure of AI assistance. Ethical approval, originality, data integrity, valid reviewer recommendations, and explicit co-author consent are essential. The presentation provides a practical pre-submission checklist to help authors improve manuscript quality, communicate contribution clearly, and use desk rejection as actionable editorial feedback.



# Karen Cheng

**Springer Nature**

## PRESENTATION TITLE

**Research Integrity in Biomedical Engineering**

## BIOGRAPHY

Karen Cheng is a Senior Publisher at Springer Nature with over 10 years of experience in academic publishing. She is responsible for the launch, management, and strategic development of biomedical and health science journals in the Springer portfolio. Prior to her publishing career, she earned a PhD from the Chinese Academy of Sciences, bringing both scientific and publishing expertise to her work in advancing scholarly communication.

## ABSTRACT

As the research landscape evolves with the impact of new technologies, there is an increasing interest in how the accuracy of research is maintained. This presentation provides an overview of the research integrity throughout the research and publishing lifecycle. Specifically, it discusses integrity challenges that are relevant to the researchers in the biomedical engineering field, including duplicate submission and redundant publication, plagiarism, data fabrication and falsification, conflicts of interest, ethical issues in studies involving humans, use of AI in scholarly publishing, etc. By fostering awareness of common integrity issues and available safeguards, this presentation aims to equip researchers with the knowledge and resources needed to conduct and communicate robust, ethical, and impactful biomedical engineering research.



# Ze Xiong

**ShanghaiTech University**

**PRESENTATION TITLE**

## Wireless and Flexible Bioelectronics for Digital Healthcare

## BIOGRAPHY

Dr. Xiong is an Assistant Professor at ShanghaiTech University. His research focuses on the development and application of wireless and flexible bioelectronics to bring digital intelligence to clinical and personalized healthcare. He has published more than 60 papers in journals including Nature Biomedical Engineering, Nature Materials, Science Advances, and Advanced Materials. His work has been featured by media outlets such as Reuters, Scientific American, AAAS, AIChE, People's Daily, and XinhuaNet. He has filed 15 patent applications (2 PCT and 1 U.S.), and has contributed one book chapter. He serves on the Youth Editorial Boards of Med-X, FlexMat, and The Innovation Materials. His honors include the Distinguished Young Scholar of China-America Frontiers of Engineering, jointly issued by the U.S. National Academy of Engineering and the Chinese Academy of Engineering, as well as the Emerging Investigator of China Award, the MINE Young Scientist Award, the Journal of Materials Chemistry C Emerging Investigator, the iCANX Young Scientist Award Finalist, the Shanghai Overseas High-Level Talent award, and the Swissnex Fellowship. He was awarded the Young Scientists Fund B, formerly known as the Excellent Young Scientists Fund in 2025.

## ABSTRACT

The seamless integration of advanced wireless technologies with flexible electronics is enabling a new generation of wearable and implantable bioelectronic sensors, with strong potential to advance digital healthcare. Among the many unmet clinical needs, postoperative wound management remains a critical challenge. Early detection of surgical complications is often limited by the lack of technologies that can directly interface with wound sites and reliably transmit data to caregivers for timely intervention. This talk will highlight three recent developments: (1) a wireless, flexible DNA–hydrogel biosensor that conformally interfaces with wounds and enables smartphone-based infection monitoring; (2) a wirelessly operated bioelectronic suture capable of in situ monitoring of physicochemical conditions in deep surgical wounds; and (3) a lotus-inspired, low-friction multiphasic minisensor for wireless intracranial pressure monitoring, exhibiting near-ideal aeroelastic performance. Collectively, these wireless and flexible bioelectronic platforms represent an important step toward scalable digital medicine and improved patient outcomes.



# Yizhe Yuan

**Shanghai Jiao Tong University**

**PRESENTATION TITLE**

## Nature Skills:The Research Skill Library for Global Scholars

## BIOGRAPHY

Yizhe Yuan is a Ph.D. candidate in Medical Artificial Intelligence at Shanghai Jiao Tong University. He received his bachelor's degree in Software Engineering from Jilin University. His research focuses on medical AI, digital pathology, and multimodal foundation models for computational healthcare.

As the first author, he has published research in leading international venues, including a Nature Portfolio journal, Chinese Academy of Sciences (CAS) Q1 journals, and CCF Class A conferences. He is also the creator of Nature-Skills, an open-source project that has attracted more than 30,000 GitHub stars, reflecting its broad impact within the AI community.

Yizhe is the recipient of the 2025 Zhuang Tiange Innovation Fund. His team was awarded the Gold Medal in the Higher Education Main Track of the China International College Students' Innovation Competition (2025). His work aims to advance trustworthy and clinically applicable AI technologies for precision medicine and digital healthcare.

## ABSTRACT

The observation domain data in medical imaging (such as K-space in MRI, sinogram in PET/CT, etc.) carry complete physical sampling information. Their distribution characteristics differ fundamentally from those of image domain data and often exhibit non-uniformity and irregularity. Modeling and generation based on the original observation domain data provide a more principle-based path: directly depicting the distribution patterns joiaNature Skills has attracted more than 30,000 stars on GitHub. This presentation showcases several representative skills within Nature Skills, including nature-polishing for manuscript language polishing, nature-citation for intelligent citation retrieval, and nature-figure for publication-quality scientific figure generation. We will discuss the motivation, design principles, development process, and practical performance of these skills, demonstrating how they improve the efficiency and quality of scientific writing and data presentation.ntly formed by the sampling signal and noise in the observation space, enabling the generation model to learn "how the signal is obtained" from the source. This report focuses on the structural characteristics of the original domain data and the generative learning paradigm, and shares two major research frontiers: one is to mine data characteristics and collaboratively build a generative model, mapping the complex and irregular observation distribution into multiple learnable and generalizable representation spaces, promoting rapid high-resolution imaging; the other is to introduce a generative base model to construct a universal original domain prior learning paradigm, achieving consistent generation and inference capabilities across tasks. Together, they provide a new theoretical framework and technical path for highly reliable and transferable intelligent imaging.




# Shanbao Tong

**Shanghai Jiao Tong University**


## PRESENTATION TITLE

**The Common Statistical Misuse and Misinterpretation in Biomedical Papers**

## BIOGRAPHY

Dr. Shanbao Tong is a professor of biomedical engineering at Shanghai Jiao Tong University. He received his B.E. from Xi'an Jiaotong University in 1995, and his M.E. and Ph.D. from Shanghai Jiao Tong University in 1998 and 2002, respectively. He completed postdoctoral training in Biomedical Engineering at Johns Hopkins University from 2002 to 2005. His research interests include neural engineering, biomedical signal processing, laser speckle blood-flow imaging, stroke rehabilitation, and transcranial ultrasound neuromodulation. He has received several major academic and teaching awards, including the National Excellent Doctoral Dissertation Award and the First Prize of the Ministry of Education Natural Science Award. He is currently Editor-in-Chief of Medical & Biological Engineering & Computing, Theme Editor for Neuroengineering at IEEE EMBC, and Co-Executive Editor-in-Chief of Med-X.

## ABSTRACT


Statistical problems remain a major threat to the reliability, interpretability, and reproducibility of academic research. This presentation examines common statistical errors encountered in biomedical and experimental studies, emphasizing that sound inference begins with sound study design rather than with post hoc analysis. Key topics include overreliance on p-values, inadequate statistical power, failure to report effect sizes and confidence intervals, and misinterpretation of statistical significance as scientific or clinical importance. The presentation also addresses questionable research practices, including hypothesizing after results are known (HARKing), p-hacking, data peeking, and uncorrected multiple comparisons. Additional pitfalls include pseudoreplication, inappropriate categorization of continuous variables, incorrect analysis of group-by-time effects, misuse of one-way instead of factorial ANOVA, and failure to account for confounding and causal structure. Particular attention is given to double dipping and data leakage in contemporary data-driven research. Practical examples and a pre-submission checklist will help researchers match statistical models to the structure of their data, report results transparently, and prioritize effect sizes, uncertainty, and reproducibility. The central message is simple: good statistics cannot rescue a poorly designed study, but poor statistical practice can undermine a well-designed one.






# Venue& Paticipant Information

# 1 CONFERENCE OVERVIEW

## Date

July 31 – August 2, 2026

- July 31 (Friday): Registration
- August 1–2 (Saturday–Sunday): Scientific Sessions

## Venue

Bao Zhaolong Library
(Antai College of Economics and Management)
1954 Huashan Road Xuhui District
Shanghai, China

## Registration Desk

Lobby, Bao Zhaolong Library
(Antai College of Economics and Management)

- July 31 (Fri) 13:00–17:00
- August 1 (Sat) 08:00–17:00
- August 2 (Sun) 08:00–12:00

## Conference Support Contacts

General Email: ccarla@sjtu.edu.cn

1. Registration & General Conference Enquiries
Contact: Xin Li +86-21-62933739
2. Conference Program & Academic Arrangements
Contact: Xin Li +86-21-62933739
3. Accommodation & Catering Arrangements
Contact: Yating Zhang 34202942-8003
4. Transportation & Pick-up Services
Contact: Tianze Sun 34202942-8006
5. Presentation Slides & AV Support
Contact: Caiqing Zhu +86-21-62933739
6. On-site Venue Services
Contact: JiachanTian jctian@sjtu.edu.cn



# 2 VENUE INFORMATION

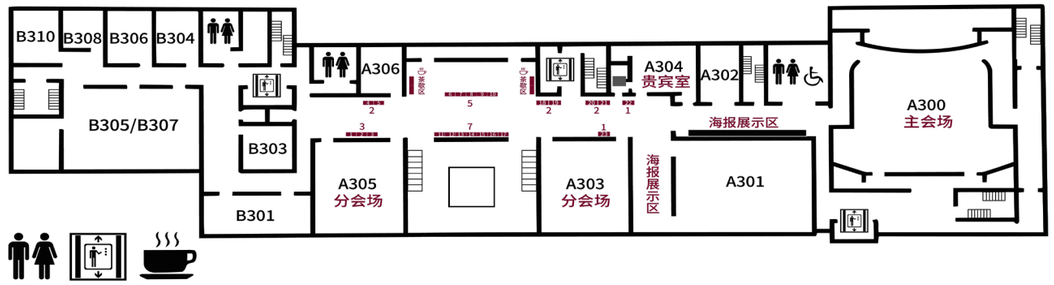
## Bao Zhaolong Library

(Antai College of Economics and Management)
1954 Huashan Road
Xuhui District, Shanghai

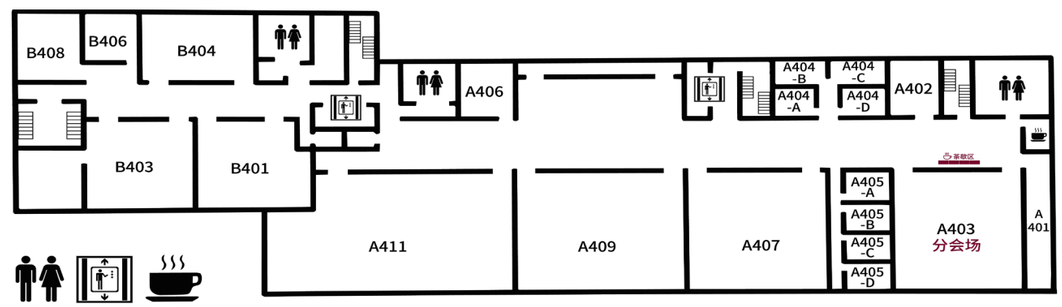



### Floor Map — Bao Zhaolong Library (Antai College of Economics and Management)

3F




4F




## On-site Facilities

·Registration Desk: Ground-floor lobby, via the marked side entrance
·Main Venue: Room A300, 3F
·Session Rooms: Rooms A303 and A305, 3F; Room A403, 4F
·Coffee Break Areas: 3F foyer near Room A306; 4F foyer area
·Poster Display Areas: 3F foyer and corridor outside Room A301
·Guest Room: Room A304, 3F

## 3 HOTEL INFORMATION

### Conference Hotel



**Crowne Plaza Shanghai（银星皇冠假日酒店）**
400 Pan Yu Road, Changning District
Shanghai 200052, China
Reservations: 400 88 40 888
Front desk: +86-21-61458888

**Check-in / Check-out**
Check-in Time: from 2pm
Check-out Time: 12 noon

**Breakfast**
Monday–Friday: 6:30 am-10:30 am
Saturday–Sunday: 6:30 am-11:00 am

Accommodation arrangements will be communicated individually by the Conference Secretariat. Please refer to your confirmation email for your reservation information and other relevant details.

## 4 SPEAKER INFORMATION

**Presentation Check-in**
• Please arrive at your session room at least 20 minutes before your presentation.
• Please check in with the session chair or conference staff upon arrival.

**Presentation Setup**
• Use the conference laptop (recommended): Please upload your presentation at least 20 minutes before your session.

**Presentation Facilities**
• Laptop (Windows)
• Projector
• Wireless presenter
• Microphone
• HDMI connection
• Recommended slide format: Widescreen (16:9), optimized for the venue display

**Technical Support**
Conference staff will assist with presentation setup and technical support before and during each session.

Please keep your presentation within the allocated time and leave time for questions and discussion.

## 5 PRACTICAL INFORMATION

### Wi-Fi Access
Network: Med_X_IC_2026
Password: 07310802

### Weather in Shanghai (Late July – Early August)
Average temperature: 28–35°C
Please bring light clothing, rain protection, and sun protection.

### Campus Access
Registered attendees may enter the campus by presenting the Campus Access Pass separately provided by the Conference Secretariat.
Parking: Green travel is encouraged.

General Enquiries
Email: ccarla@sjtu.edu.cn
For service-specific contacts, please see Conference Overview.

UNITED 联影 IMAGING

uMR 890

超高性能科研型3.0T超导磁共振系统
Ultra-High-Performance 3.0T Research MRI

uAIFI Technology

国家脑计划项目指定机型
科研级超导磁体架构，均匀度是传统高端3.0T磁共振的3~13倍，高清影像轻松可得
超高性能梯度系统（单轴场强120mT/m，切换率200T/m/s），适用于脑科学研究
搭载全数字化射频系统和智能光梭成像技术，提升扫描速度和图像质量




用心感知 | PERCEIVE MORE. 用心创造 | PROVIDE MORE. 用心靠近 | ACCESS MORE.

UNITED 联影 IMAGING

# 联影生命科学仪器

## —— 为科研创造无限可能

打造贯穿“小动物影像--大动物影像--临床应用”的转化医学创新平台，无缝联动基础研究、生命科学研究和临床医学转化。



### uMR 9.4T 超高场临床前MRI

- 业界顶尖系统性能
- 可更换双梯度系统
- PET成像系统
- 微米级结构成像
- 丰富的功能成像应用
- 全面赋能多学科研究



### uCT microPCCT 光子计数小动物能谱显微CT

- 新一代光子计数显微成像技术
- 卓越的物质分辨能力
- 优异的金属伪影抑制效果
- 丰富的定量分析方法



### uMicroEXPLORER PET/CT 超高性能小动物显微PET/CT

- 兼具高灵敏、高分辨和True-DOI
- 超长轴向视野
- 全身覆盖高通量同时动态成像



### uBioEXPLORER 超高性能大动物全身研究PET/CT

- 多类型实验动物模型选择
- 57cps/kBq突破性灵敏度
- 非人灵长动物全身动态成像
- 秒级实时跟踪药物代谢过程

# sunna | 生纳科技（上海）有限公司

# Sunna Technologies (Shanghai) Co.,Ltd.

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## 公司简介

生纳科技（上海）有限公司是上海张江伯克利工程创新中心从美国加州大学伯克利分校引进的第一个项目。芯原股份创始人、董事长兼总裁、伯克利上海校友会会长戴伟民博士为联合创始人。生纳科技专注于生物医药技术在高价值医疗器械和新材料领域的研发与产业化，已建成国际领先的技术平台，形成以产业化静电纺丝工艺、表面化学技术及生物活性材料为核心的三大技术体系。基于创新性的生物材料与工艺，跨学科结合物理、化学、仿生及先进制造技术，公司成功实现多项技术临床转化，并持续开发系列产品；在研管线全面覆盖肾内科、血管外科、神经外科、运动医学及医疗美容等快速增长领域。

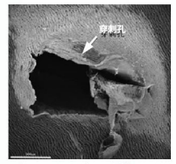
## 肝素涂层人工血管

生纳科技采用静电纺丝工艺，结合独特的抗凝涂层技术，制成具备可即时穿刺、抗凝血、抗弯折等突出性能优势的小口径人工血管，该产品可代替自体血管用于为有需要的慢性肾病患者建立透析血管通路，是国产首款在术后24小时内顺利完成血液透析的即穿型人工血管，也是国产首款具有肝素抗凝涂层的药械组合人工血管。目前，该产品已完成临床试验全部入组，受到全国各试验中心临床专家的广泛认可，并于2026年5月成功入选国家创新医疗器械特别审查程序。

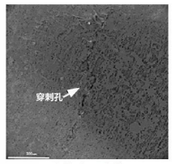
### 技术优势

**一.可即时穿刺**

选用力学性能优异的医用聚氨酯原料，通过静电纺丝工艺制备具有三维仿生结构的人工血管，该设计使人工血管具有良好的穿刺自愈合性，可以达到优异的拔针止血效果，让植入后数小时至数天内进行穿刺成为可能，最短17个小时内完成首次穿刺。



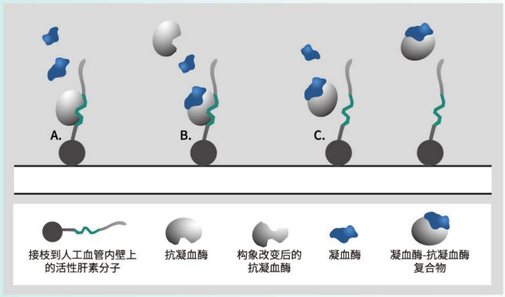

ePTFE人工血管
穿刺孔电镜图




生纳人工血管
穿刺孔电镜图

**二.肝素涂层抗凝血**

采用全球领先的专利涂层技术，将抗凝血药物肝素通过化学接枝结合在人工血管上，可维持血透通路的长期肝素化，降低因凝血造成人工血管狭窄和堵塞的发生几率。




A. 肝素分子的生物活性位点激活抗凝血酶使其与凝血酶结合。

B. 抗凝血酶与凝血酶结合后，形成失活的复合物。

C. 失活的复合物与肝素分子脱离。活性位点可以再次与抗凝血酶结合。

**三.抗弯折**

抗弯折环的结构设计可以有效支撑起人工血管防止扁塌和扭结，同时该结构设计使人工血管仍保持良好的顺应性和穿刺效果。





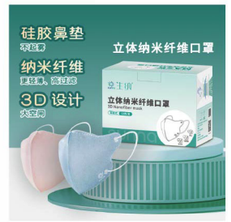

## 纳米纤维固态面膜

- 无防腐剂
- 遇水即溶
- 10秒敷用




## 纳米纤维口罩

- 纳米纤维高科技
- 四层过滤更安全
- 硅胶鼻垫防起雾
- 立体剪裁更舒适



# 生纳科技（上海）有限公司
# Sunna Technologies (Shanghai) Co.,Ltd.

More information

## Company Profile

Sunna Technologies (Shanghai) Co., Ltd. is the first project introduced from the University of California, Berkeley, through Shanghai Zhangjiang Berkeley Engineering Innovation Center. Sunna was cofounded by Dr. Wayne Wei-Ming Dai, Founder, Chairman and President of VeriSilicon Microelectronics (Shanghai) Co., Ltd. and President of CAL Alumni Club of Shanghai. Sunna specializes in the research, development, and industrialization of biomedical technologies for high-value medical devices and new materials.The company have established an internationally leading technology platform and established three core technology systems centered on industrial electrospinning processes, surface chemistry technologies and bioactive material applications. Leveraging innovative biomaterials and processes through interdisciplinary integration of physics, chemistry, biomimetics and advanced manufacturing technologies, the company has achieved clinical translation of multiple technologies and continues to develop a series of products. Its research pipeline covers fast-growing sectors including nephrology, vascular surgery, neurosurgery, sports medicine and medical aesthetics.

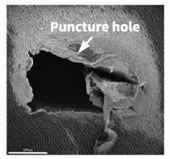
## Vascflow® Heparin-Coated Vascular Graft

Sunna employs an electrospinning process combined with a unique anticoagulant coating technology to produce small-diameter vascular grafts with outstanding performance advantages, including early cannulation, anticoagulation, and anti-kinking. This product can replace Arteriovenous Fistula to establish dialysis vascular access for chronic kidney disease patients.It is the first domestically produced early-cannulation vascular graft that enables successful hemodialysis within 24 hours post-implantation, as well as the first domestic drug-device combination vascular graft with a heparin-based anticoagulant coating. Currently, the product has completed all clinical trial enrollments, gained widespread recognition from clinical experts across trial centers nationwide. It was also successfully selected into the Special Review Procedure for Innovative Medical Devices administered by NMPA in May 2026.

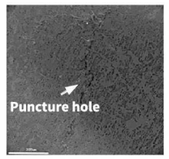
## Technical Advantage

### 1.Early Cannulation

Made from medical-grade polyurethane with exceptional mechanical properties, the vascular grafts are fabricated via electrospinning process to create a 3D bionic structure. This design grants the grafts excellent self-sealing properties after puncture, achieving superior hemostasis effect upon needle withdrawal, and making it possible to perform early cannulation within hours to days after implantation. The shortest time to complete the first cannulation is within 17 hours after implantation in clinical trial.



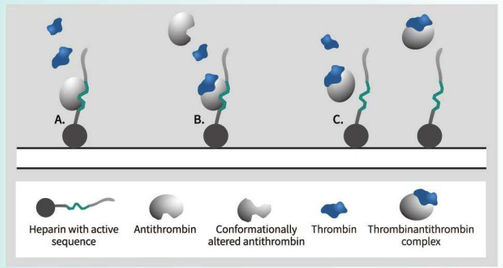
SEM image of puncture hole on ePTFE vascular graft



SEM image of puncture hole on VascFlow® vascular graft

### 2.Anti-Coagulation Heparin Coating

Employing a globally leading patented coating technology, anti-coagulation drug heparin is chemically bonded to the vascular grafts, which maintains long-term heparinization and reduces the risk of stenosis and occlusion caused by blood clots.




**A.** Bioactive site of the heparin molecule enables antithrombin to bind thrombin.

**B.** When antithrombin binds to thrombin, a neutral AT-T complex is formed.

**C.** Neutral AT-T complex detaches from the heparin molecule. Active site becomes available to again bind antithrombin.

### 3.Anti-Kinking

The structural design of the anti-kinking ring provides support for the vascular graft to prevent collapse and kink, without compromising the compliance and puncture performance.





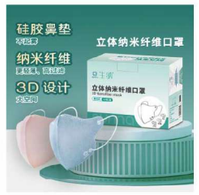

## Nanofiber Solid Facial Mask

- **Preservative-Free**
- **Immediate Dissoving**
- **Apply in 10 seconds**



## 3D Nanofiber Mask

- **High-tech nanofiber**
- **Safer four-layer filtration**
- **Silicone nose pad prevents fogging on glasses**
- **More comfortable structure from 3D cutting process**



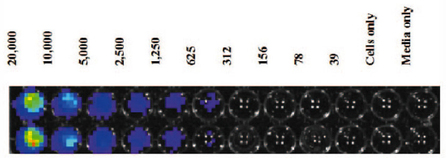

Hinata

Hinata
雏 田 生 物 技 术

# 更早看见药效，更快洞见研发真相

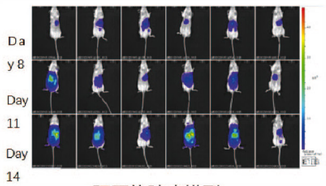
## 雏田生物·专注临床前药理药效评估CRO

### 肿瘤细胞库构建



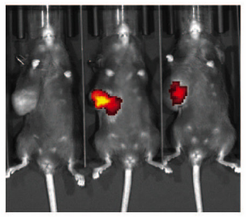
Luc细胞株构建

### 原位肿瘤开发及药效评价

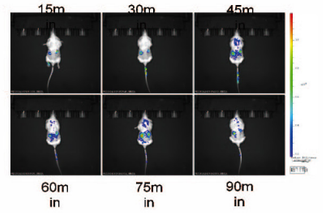


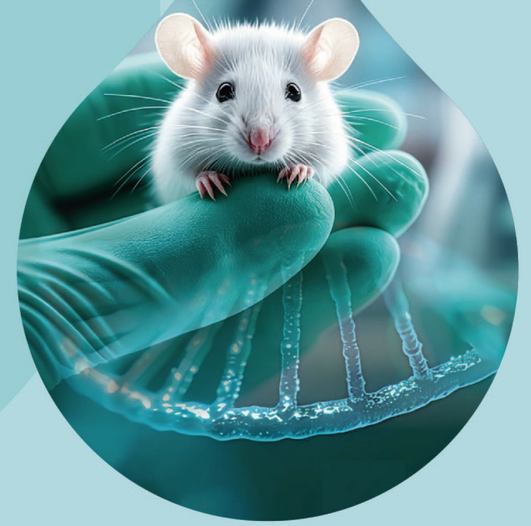
肝原位肿瘤模型

### 大分子抗体体内肿瘤靶向



### 自免模型开发及药效评价




上海雏田生物技术有限公司

上海市浦东新区周浦镇半夏路100号7号楼 400-820-3556 yong.zhang@hinatabio.com www.hinatabio.com

# 上海玮驰仪器有限公司

聚焦先进技术 · 赋能创新药客户 · 共创价值

WEICHILAB 上海玮驰

## 公司简介

上海玮驰，成立于2015年，位列首批张江科学城重点机构。公司深耕生物制药领域，和Bio-Rad、瑞孚迪、Repligen、Bruker、CBS等多品牌达成战略合作，服务中国3000余家生物制药客户。

玮驰具备ISO9001、ISO14001、OHSAS18001质量体系认证，依托先进技术生产力的产品，完善的售前售后体系，资质齐全的专业服务团队，强大的供应链与物流保障，助力客户革新升级。

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80+ — 覆盖全球80多个国家和地区 Covering more than 80 countries and regions

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我国高端医学影像行业的骨干企业

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安科已成长为具备CT、磁共振、DR、DBT数字乳腺机

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# 臻视生命每一处细微
# INSIGHT INTO LIFE




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全新APEX智能影像链
全面Deep智能化
mCS自适应感知成像
最高达32倍加速
4th射频共振激发技术
双源多点RF发射

## 数字乳腺 X射线摄影系统 ASR-4000T

数字乳腺断层
层层剖析，诊断更精准
加速迭代重建
高速运算，成像更快速
动态几何校正
实时跟踪，影像更保真
智能伪影校正
拒绝伪影，影像更清晰
智能剂量控制
呵护健康，拍摄更安全

# Ceturegel® 基质胶

YEASEN | 翌圣生物




### SPF级别动物中心

·参考国标进行严格检疫
·小鼠来源/年龄精准可控

### 严格质量控制

·检测小鼠种群中的病毒、病原菌寄生虫及细菌
·包括LDEV等多种病原体进行检测
·对支原体进行检测
·凝胶限度检查法检测产品内毒素水平

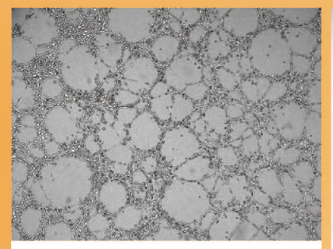
### 批次稳定

·月产量达50 L以上

### 应用广泛

·适应于体内模型构建、细胞的迁移或侵袭、血管生成、类器官构建等

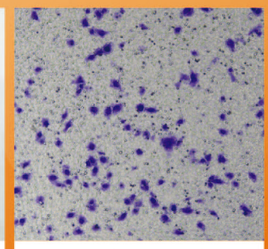
## Ceturegel® 基质胶应用验证



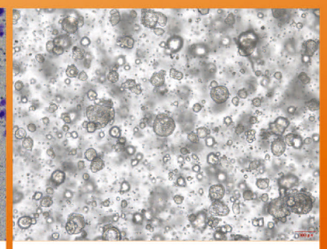
血管生成展示图




皮下成瘤展示图



细胞侵袭展示图



宫颈癌类器官展示图

## 常用型号及应用

| 类型 | 货号 | 产品名称 | 应用方向 |
|---|---|---|---|
| 基本浓度 8-12 mg/ml | 40183ES HOT | Ceturegel® Matrix LDEV-Free基质胶 | 主要用于皮下成瘤、细胞侵袭、2D/3D细胞培养 |
| 高浓度 ≥18mg/ml | 40187ES | Ceturegel® Matrix High Concentration，LDEV-Free 基质胶 | 主要用于体内成瘤实验（较难成的细胞系） |
| 低生长因子 | 40186ES HOT | Ceturegel® Matrix GFR，Phenol Red-Free，LDEV-Free 基质胶 | 主要用于血管生成实验 |
| 干细胞专用 | 40190ES | Ceturegel® Matrix hESC-Qualified，LDEV-Free 基质胶 | 主要用于如hESC，iPSC等干细胞培养 |
| 类器官专用 | 40192ES HOT | Ceturegel® Matrix for Organoid culture，Phenol Red-Free，LDEV-Free Plus 基质胶 | 主要用于类器官培养 |

翌圣生物科技（上海）股份有限公司
Yeasen Biotechnology (Shanghai) Co., Ltd.
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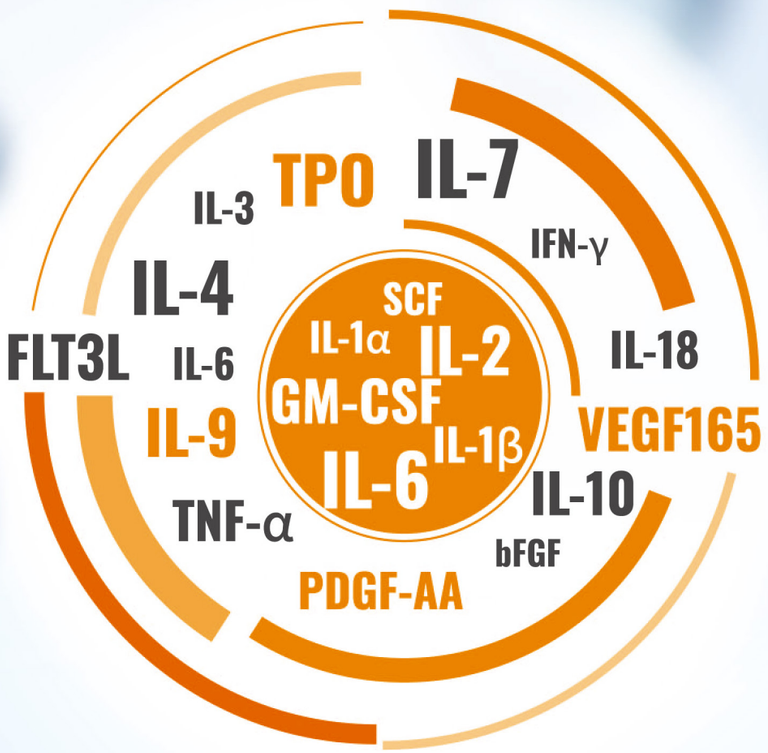
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# 高质量GMP细胞因子

YEASEN | 翌圣生物




## GMP级蛋白质量管理体系

- 经 ISO 13485:2016认证的洁净生产车间
- 符合《药品生产质量管理规范》体系
- 具有批准质量证书(COA)
- 无动物源性材料和生产环境
- 医药产品原辅料生产基地
- 支持线上/线下审计

## 确保安全和有效

- 内毒素:<10 EU/mg
- 宿主DNA残留:< 20 ng/mg
- 宿主蛋白残留:< 0.5 ng/μg
- 无菌检测:阴性
- 支原体检测:阴性
- 外源病毒检测:阴性

## 遵循监管准则

- 符合《中华人民共和国药典》2020年版三部通则:生物制品生产用原材料及辅料质量控制
- 符合USP Chapter <92> Growth Factors and Cytokines Used in Cell Therapy Manufacturing
- 符合Ph. Eur. General Chapter 5.2.12, Raw Materials of Biological Origin for the Production of Cell-based and Gene Therapy Medicinal Products.



翌圣生物科技(上海)股份有限公司
Yeasen Biotechnology (Shanghai) Co., Ltd.
定购电话:400-6111-883
Web: www.yeasen.com
E-mail: marketing@yeasen.com
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# 维通达六大动物模型体系

### 高度免疫缺陷及自发肿瘤模型

免疫缺陷大鼠F334RG
免疫缺陷小鼠NPG、NRG
NPG衍生品系NPG-GM3、DK-NPG
自发肿瘤模型KPC、rasH

### 人源化免疫模型

免疫系统人源化HuHSC-NPG
HuPBMC-DK-NPG、HuHSC-NPG-GM3
靶点基因人源化hPD-1、hCD3E、hCTLA4
hTIGIT、hLAG3等

### 肝病动物模型

人源化肝脏小鼠Hu-URG®
Hu-Fah
乙肝小鼠
可诱导肝损伤小鼠、肝癌小鼠
DIO、MASH模型

### 代谢性疾病动物模型

高脂血症小鼠Ldlr、Apoe
脂代谢模型小鼠hPCSK9 BAC
糖脂代谢模型小鼠hGLP1R

### 工具鼠模型

红色Reporter工具鼠
绿色Reporter工具鼠
双色Reporter工具鼠
Cre工具鼠

### 神经性疾病、衰老及其他模型

神经退行性疾病小鼠、衰老小鼠
药物代谢小鼠
疫苗评价小鼠
无毛小鼠

# 维通达五大服务研究平台

### 基因编辑与服务

可根据实验要求，量身设计方案，采用合适的编辑方法，准确，高效的制备目标动物/细胞模型，同时拥有完善的显微操作、种群管理平台。

### 肿瘤相关研究

肿瘤移植平台累积了大量同源肿瘤移植、异源肿瘤移植模型经验，同时还可以提供肿瘤免疫双人源化建立及药效评价等服务。

### 肝（病）相关研究

肝（病）研究平台建立了人源化肝脏小鼠等模型，拥有丰富的肝移植经验，可以提供病毒性肝病、肝纤维化、药物代谢研究等服务。

### 代谢性疾病相关研究

代谢性疾病研究平台可提供小核酸临床前研究、MASH等代谢性疾病研究服务。

### 手术或诱导造模

拥有20余年手术及造模经验，拥有成熟的手术技术、标准化药物诱导流程。能够精准构建各类疾病动物模型。

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