

Xuantao Su, Ph.D.

Research Background

I have worked in the field of CYTOMETRY for more than 20 years. Time went back to the year of 2008, when I obtained my PhD degree from the University of Alberta with my dissertation focused on label-free characterization of single cells with microfluidic cytometry. Two years later, I moved back to China and joined Shandong University as a professor in the Department of Biomedical Engineering. I founded the MOEMS Lab at Shandong University, aiming to develop the next-generation instruments and methods for single-cell/particle analysis, and to educate new generations for the advancement of cytometry. Over the past 15 years or so, my group has contributed about 30 papers in well-reputed journals, and filed more than 20 China or US patents, for which I am the first or corresponding author. I have advised more than 50 graduate students (~1/3 of them are PhD students), in the basic research areas related to cytometry. My group has also raised several major research funding, some of which are collaborated with cytometry-related companies.

My engagement with ISAC can be summarized into three main categories, serving for the ISAC journal of Cytometry Part A, serving for the ISAC committees, and serving for the ISAC conferences. I have been an associate

editor and editorial board member for Cytometry Part A for about 10 years. As the guest editor, together with other experts in our community, I edited 4 special issues in Cytometry Part A. I have managed around 30 manuscripts as associate editor or guest editor with the editor in chief of Cytometry Part A over the years. From around 2000, I served as a member of the Scientific Communications Committee of ISAC. I am also a committee member for the taskforce of EDI (ISAC), and the representative of associate society of ISAC in China. More generally, I served in many other cytometry-related committees, such as the Chair of the Biomedical Photonics Committee of Shandong Biomedical Engineering Society and the standing committee member of the Cell Analysis Branch of Chinese Society of Bioengineering. As for ISAC conferences, I have served as conference program committee for CYTO 2023 and CYTO 2026. I have also been conference Chairs/Co-chairs or sessional Chairs for many cytometry-related conferences, for example, the Conference of Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues (BO500) at Photonics West.

Vision Statement

I am well motivated to serve as the Basic Research Councilor of ISAC. As a Professor who works in the basic research field of cytometry for about 20 years, I feel it is my duty and great opportunity to bridge the large

population of people in areas of basic research well with ISAC as councilor. The answer to fulfill our strategic plan to communicate well with the community about who we are and the impact of our work may lie in the multidiscipline of cytometry. Cytometry is not a narrow technology, and ISAC is inclusive and multidisciplinary. With the lead of the executive committee and council, I look forward to people joining us from various basic research areas in science, engineering, medicine and agriculture.

Secondly, Cytometry Part A, the journal of ISAC, is so closely tied to our ISAC members in various basic research areas. Cytometry Part A is one of our ISAC platforms for education and knowledge propagation. As the associate editor of the journal, it is my obligation to make our ISAC members be honored with the journal. This would be better performed by serving as the Basic Research Councilor of ISAC. Moreover, I am very interested in working for the more globalization of ISAC. As the representative of associate society of ISAC in China, I had the chances to know other associate societies worldwide. I believe there are lots of works worthy to be pursued to connect better the world with ISAC and to make ISAC more international, for example, having more people in the basic research fields from Asia in ISAC.

If I am so honored to be a Basic Research Councilor of ISAC, I would enthusiastically devote into serving ISAC, our members, and more generally the broad cytometry-related societies from the basic research side for the advancement of cytometry. Together, we are turning our vision that cytometry will help solve global challenges into reality.

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Education

- Ph. D. in Physics, University of Alberta, Canada, Mar. 2008.
Thesis: Light Scattering in an Integrated Microfluidic Waveguide Cytometer
- B. S. in Physics, Shandong University, China, July 2000.

Work Experience

- **Professor**, School of Integrated Circuits (Formerly: School of Microelectronics), Shandong University, 2020/08 to present.
Professor, Department of Biomedical Engineering, Shandong University, 2010/11~2020/08.
Key words: Biomedical MOEMS; Biophotonics; Flow Cytometry; Visualization of Nanoscale EVs, Single-cell Methods; Label-free Methods; Artificial Intelligence for Biomedicine; Cancer Screening.
- **Director**, Office of Graduate Education, Shandong University, 2018/05-2019/08.
- **Director**, Institute of Biomedical Engineering, School of Control Science and Engineering, Shandong University, 2013/06-2018/12.
- **Postdoctoral fellow**, Department of Electrical and Computer Engineering, University of Alberta, 05. 2008 to 11. 2010.
- **Teaching/Research Assistant**, Department of Physics, University of Alberta, 09. 2002 to 03. 2008.
- **Instructor (Professor)**, *MOEMS (Graduate level)*, Shandong University, 2021 to present.
- **Instructor (Professor)**, *Advanced Biomedical Optics (Graduate level)*, Shandong University, 2012 to present.
- **Instructor (Professor)**, *Biomedical Micro-Optics (Undergraduate level)*, Shandong University, 2023 to present.
- **Instructor (Professor)**, *University Physics: Electromagnetism and Optics (Undergraduate*

level), Shandong University, 2021 to present.

- **Instructor (Professor)**, *Modern Biomedical Optical Instruments (Undergraduate level)*, Shandong University, 2011~2019.
- **Instructor (Professor)**, *Electromagnetic Field Theory (Undergraduate level)*, Shandong University, 2013~2020.
- **Instructor (Lecturer)**, *Electricity and Magnetism (Undergraduate level)*, University of Alberta, Fall term, 2009.

Academic Positions

- **Advisory Editor**, *Biophotonics Discovery*, Since 2024.
- **Associate Editor**, *Cytometry Part A*, Since 2020.
- **Vice Secretary-General**, *Shandong Biomedical Engineering Society*, Since 2020.
- **Chair**, *Biomedical Photonics Committee of Shandong Biomedical Engineering Society*, since 2020.

Peer-reviewed Journal Publications

(37 as first author or corresponding author)

1. F. M. Eltigani and **X. T. Su***, *Recent advances in label-free light scattering imaging and sensing of single cells and exosomes*, **TRAC Trends in Analytical Chemistry**, Vol. 196, 118659 (2026).
2. Z. Li, X.Y. Zhang, G.S. Li, J. Peng and **X. T. Su***, *Light Scattering Imaging Modal Expansion Cytometry for Label-free Single-cell Analysis with Deep Learning*, **Computer Methods and Programs in Biomedicine**, Vol. 264, 108726 (2025).
3. W. Q. Wang, R.H. Liu, S. W. Zhu, M. J. Zhou, B. Jin, S. B. Lu*, M. Liu*, **X. T. Su***, and W. Ji, *Enhanced three-photon absorption excited at near-infrared laser pulses and stability of MAPbBr₃ quantum dots encapsulated in mesoporous single MOF-5 crystals*, **Journal of Materials Chemistry C**, Vol. 13, 5719-5724 (2025).
4. F. M. Eltigani, X. Y. Zhang, M. Liu, J. Peng, and **X. T. Su***, *Intelligent dual-modality label-free cell classification with light scattering imaging and Raman spectra*

- measurements*, **Optics and Laser Technology**, Vol. 178, 111208 (2024).
5. Z. W. Wang, Q. Liu, J. Zhou, and **X. T. Su***, Single-detector multiplex imaging flow cytometry for cancer cell classification with deep learning, **Cytometry Part A**, Vol. 105, 666-676 (2024).
 6. J. M. Xie, Y. F. Wei, X. H. Liang*, C. H. Ma, and **X. T. Su***, In situ Single-cell Spontaneous Raman Spectroscopy Differentiates Tumor-associated Macrophages, **Sensors and Actuators B: Chemical**, Vol. 417, 136053 (2024).
 7. C. Liu, Z. Yuan, Q. Liu, K. Song, B. H. Kong and **X. T. Su***, Siamese deep learning video flow cytometry for automatic and label-free clinical cervical cancer cell analysis, **Biomedical Optics Express**, Vol. 15(4), 2063-2077 (2024).
 8. F. M. Eltigani, X. Y. Zhang, Q. Liu, M. Liu, J. Peng, and **X. T. Su***, Label-free scattering image-spectro-microscopy for single cell and extracellular vesicle analysis, **Sensors and Actuators B: Chemical**, Vol. 396, 134572 (2023).
 9. Z. W. Wang, Q. Liu, R. Chu, K. Song, and **X. T. Su***, Single-detector dual-modality imaging flow cytometry for label-free cell analysis with machine learning, **Optics and Lasers in Engineering**, Vol. 168, 107665 (2023).
 10. Z. Wang, G. Chen, S. L. Wang, and **X. T. Su***, Three-dimensional deep regression-based light scattering imaging system for nanoscale exosome analysis, **Biomedical Optics Express**, Vol. 14, 2055-2067 (2023).
 11. C. Liu, Z. Wang, J. K. Jia, Q. Liu, and **X. T. Su***, High-content video flow cytometry with digital cell filtering for label-free cell classification by machine learning, **Cytometry Part A**, Vol. 103, 325-334 (2023).
 12. S. S. Liu, R. Chu, J. M. Xie, K. Song, and **X. T. Su***, Differentiating single cervical cells by mitochondrial fluorescence imaging and deep learning-based label-free light scattering with multi-modal static cytometry, **Cytometry Part A**, Vol. 103, 240-250 (2023).
 13. **X. T. Su*** and A. Tarnok*, A mini review of recent development of flow cytometry in China, **Cytometry Part A** Vol. 101, 614-616 (2022).
 14. Y.F. Zhang*, Y. Xia, H.T. Liang, J.H. Zhang, K. Li, C.Z. Yuan, H.L. Ma, W.J. Wang, Q.P. Wang and **X. T. Su***, Label-Free Diagnosis of Ovarian Cancer Using Spoof Surface

- Plasmon Polariton Resonant Biosensor, **Sensors and Actuators B: Chemical**, Vol. 352, 130996 (2022).
15. Z. Wang, S. L. Wang, G. Chen, and **X. T. Su***, Deep learning based label-free small extracellular vesicles analyzer with light-sheet illumination differentiates normal and cancer liver cells, **Sensors and Actuators B: Chemical**, Vol. 347, 130612 (2021).
 16. R. Chu, Y. Zhang, X. Qiao, L. Xie, W. Chen, Y. Zhao, Y. T. Xu, Z. Yuan, X. L. Liu, A. J. Yin, Z. W. Wang, Q. Zhang, X. S. Yang, **X. T. Su**, B. H. Kong and K. Song, Risk stratification of early-stage cervical cancer with intermediate-risk factor: model development and validation based on machine learning algorithm, **Gynecologic Oncology**, Vol. 26(12), e2217-e2226 (2021).
 17. **X. T. Su***, Multidisciplinary single-cell optical cytometry, **Cytometry Part A** Vol. 99, 1065-1066 (2021).
 18. T. Peng, X. Y. Su, X. Z. Cheng, Z. W. Wei, **X. T. Su*** and L. Qin*, A Microfluidic Cytometer for White Blood Cell Analysis, **Cytometry Part A** Vol. 99, 1107-1113 (2021).
 19. **X. T. Su** and L.Y. Chen, Quantitative single-cell optical technologies, **Cytometry Part A**, Vol. 99, 557-559 (2021).
 20. S. S. Liu, Z. Yuan, Q. Liu, X. Qiao, K. Song, B. H. Kong, and **X. T. Su**, Light scattering pattern specific convolutional network static cytometry for label-free classification of cervical cells, **Cytometry Part A**, Vol. 99, 610-621 (2021).
 21. J. Sun, L. Wang, Q. Liu, A. Tarnok and **X. T. Su**, Deep learning-based light scattering microfluidic cytometry for label-free acute lymphocytic leukemia classification, **Biomedical Optics Express**, Vol. 11, 6674-6686 (2020).
 22. J. Sun, A. Tarnok and **X. T. Su**, Deep learning-based single-cell optical studies, **Cytometry Part A**, Vol. 97, 226-240 (2020).
 23. **X. T. Su**, and X. B. Wei, Cytometry and prevalent cancers in Asia, **Cytometry Part A**, Vol. 97, 11-14 (2020).
 24. **X. T. Su**, T. Yuan, Z. W. Wang, K. Song, R. R. Li, C. Z. Yuan, and B. H. Kong, Two-Dimensional Light Scattering Anisotropy Cytometry for Label - Free Classification of Ovarian Cancer Cells via Machine Learning, **Cytometry Part A**, Vol. 97, 24-30 (2020).

25. L. Xie, R. Chu, K. Wang, X. Zhang, J. Li, Z. Zhao, S. Yao, Z. W. Wang, T. T. Dong, X. S. Yang, **X. T. Su**, X. Qiao, K. Song and B. H. Kong, Prognostic Assessment of Cervical Cancer Patients by Clinical Staging and Surgical-Pathological Factor: A Support Vector Machine-Based Approach, **Frontiers in Oncology**, Vol. 10, 1353 (2020).
26. R. Chu, W. Chen, G. G. Song, S. Yao, L. Xie, L. Song, Y. Zhang, L. J. Chen, X. L. Zhang, Y. Y. Ma, X. Luo, Y. Liu, P. Sun, S. Q. Zhang, Y. Fang, T. T. Dong, Q. Zhang, J. Peng, L. Zhang, Y. Wei, W. X. Zhang, **X. T. Su**, X. Qiao, K. Song, X. S. Yang, and B. H. Kong. Predicting the Risk of Adverse Events in Pregnant Women with Congenital Heart Disease, **Journal of the American Heart Association**, Vol. 9, e016371 (2020).
27. H. F. Wei, L. Y. Xie, Q. Liu, C. S. Shao, X. M. Wang and **X. T. Su**, Automatic classification of label-free cells from small cell lung cancer and poorly differentiated lung adenocarcinoma with 2D light scattering static cytometry and machine learning, **Cytometry Part A**, Vol. 95, 302-308 (2019).
28. S. Yao, L. Li, **X. T. Su**, K. Wang, Z. J. Lu, C. Z. Yuan, J. B. Feng, S. Yan, B. H. Kong, K. Song, Development and evaluation of novel tumor-targeting paclitaxel-loaded nano-carriers for ovarian cancer treatment: in vitro and in vivo, **Journal of Experimental and Clinical Cancer Research**, 37(1):29-29 (2018).
29. J. Li, S. Yao, K. Wang, Z. J. Lu, **X. T. Su**, L. Li, C. H. Yuan, J. B. Feng, S. Yan, B. H. Kong, K. Song, Hypocrellin B-loaded, folate-conjugated polymeric micelle for intraperitoneal targeting of ovarian cancer in vitro and in vivo, **Cancer Science**, 109(6): 1958-1969 (2018).
30. M. A. Lin, Q. Liu, C. Liu, X. Qiao, C. S. Shao, and **X. T. Su**, Label-free light-sheet microfluidic cytometry for the automatic identification of senescent cells, **Biomedical Optics Express**, Vol. 9, 1692-1703 (2018).
31. L. Y. Xie, Q. Liu, C. S. Shao, and **X. T. Su**, Automatic classification of acute and chronic myeloid leukemic cells with wide-angle label-free static cytometry, **Optics Express**, Vol. 25, 29365-29373 (2017).
32. L. P. Sun, D. Li, K. Song, J. L. Wei, S. Yao, Z. Li, **X. T. Su**, X. L. Ju, L. Chao, X. H. Deng, B. H. Kong and L. Li, Exosomes derived from human umbilical cord mesenchymal stem

- cells protect against cisplatin-induced ovarian granulosa cell stress and apoptosis in vitro, **Scientific Reports**, Vol. 7, 2552 (2017).
33. X. T. Su and A. Tárnok, Cytometry advancement: a perspective from China, **Cytometry Part A**, Vol. 89, Iss. 12, 1049-1051 (2016).
34. M. A. Lin, X. Qiao, Q. Liu, C. S. Shao, and X. T. Su, Light-sheet-based 2D light scattering cytometry for label-free characterization of senescent cells, **Biomedical Optics Express**, Vol. 7, 5170-5181 (2016).
35. L. Y. Xie, Q. Liu, C. S. Shao, and X. T. Su, Differentiation of normal and leukemic cells by 2D light scattering label-free static cytometry, **Optics Express**, Vol. 24, 21700-21707 (2016).
36. L. Y. Xie, Y. Yang, X. M. Sun, X. Qiao, Q. Liu, K. Song, B. H. Kong, and X. T. Su, 2D light scattering static cytometry for label-free single cell analysis with submicron resolution, **Cytometry Part A**, Vol. 87, 1029-1037 (2015). (Cover image of Cytometry Part A) (Feature article in Cytometry Part A, Label-free static cytometry, Nov. 2015.)
37. X. T. Su, S. S. Liu, X. Qiao, Y. Yang, K. Song, and B. H. Kong, Pattern recognition cytometry for label-free cell classification by 2D light scattering measurements, **Optics Express**, Vol. 23, 27558-27565 (2015).
38. Z. Li, L. P. Sun, Z. J. Lu, X. T. Su, Q. F. Yang, X. Qu, L. Li, K. Song, and B. H. Kong, Enhanced effect of photodynamic therapy in ovarian cancer using a nanoparticle drug delivery system, **International Journal of Oncology**, Vol. 47, 1070-1076 (2015).
39. X. T. Su, Y. Y. Qiu, L. Marquez-Curtis, M. Gupta, C. E. Capjack, W. Rozmus, A. Janowska-Wieczorek and Y. Y. Tsui, Label-free and non-invasive optical detection of the distribution of nanometer-size mitochondria in single cells, **Journal of Biomedical Optics**, Vol. 16, 067003 (2011).
40. X. T. Su, S. E. Kirkwood, M. Gupta, L. Marquez-Curtis, Y. Y. Qiu, A. Janowska-Wieczorek, W. Rozmus, and Y. Y. Tsui, Microscope-based label-free microfluidic cytometry, **Optics Express**, Vol. 19, 387-398 (2011). (Feature article in **Photonics Spectra**, Optofluidics and the Real World: Technologies Evolve to Meet 21st Century Challenges, June 2011, by Gary Boas.)

41. **X. T. Su**, W. Rozmus and Y. Y. Tsui, Wide angle multiple scattering differentiation of organelle size particle distributions in whole cells, **Cytometry Part A**, Vol. 77A, 580-584 (2010).
42. **X. T. Su**, K. Singh, W. Rozmus, C. Backhouse and C. Capjack, Light scattering characterization of mitochondrial aggregation in single cells, **Optics Express**, Vol. 17, 13381-13388 (2009).
43. P. M. Pilarski, **X. T. Su**, D. M. Glerum and C. J. Backhouse, Rapid simulation of wide-angle scattering from mitochondria in single cells, **Optics Express**, Vol. 16, 12819-12834 (2008).
44. **X. T. Su**, K. Singh, C. Capjack, J. Petracek, C. Backhouse and W. Rozmus, Measurements of light scattering in an integrated microfluidic waveguide cytometer, **Journal of Biomedical Optics**, Vol. 13, 024024 (2008).
45. **X. T. Su**, C. Capjack, W. Rozmus and C. Backhouse, 2D light scattering patterns of mitochondria in single cells, **Optics Express**, Vol. 15, 10562-10575 (2007).
46. K. Singh, **X. T. Su**, C. G. Liu, C. Capjack, W. Rozmus and C. J. Backhouse, A miniaturized wide-angle 2D cytometer, **Cytometry Part A**, Vol. 69A, 307-315 (2006). (Feature article in **Biophotonics International**, Miniature 2-D flow cytometer, May 2006, by Raquel Harper.)

Conference Proceedings

(32 as first author or corresponding author)

1. X. Wang, M. L. Wang, J. J. Wang, and **X. T. Su**, Light scattering imaging and sizing of small extracellular vesicles, **Proceedings of SPIE**, Vol. 13855, 1385506 (2026).
2. Z. W. Wang, J. Zhou, Q. Liu, L. M. Wang, and **X. T. Su**, Multiplex imaging flow cytometry with content-aware image restoration deep learning enhances cell imaging quality, **Proceedings of SPIE**, Vol. 13418, 134183R (2024).
3. F. M. Eltigani, N. A. Mohamed, and **X. T. Su**, Light scattering imaging combined with machine learning for label-free identification of live yeast cells, **Proceedings of SPIE**, Vol. 13271, 132710G (2024).

4. Z. W. Wang, J. Zhou, Q. Liu, and **X. T. Su**, Development of a single-detector imaging flow cytometer for light scattering and fluorescence dual-modality analysis with deep learning, **Proceedings of SPIE**, Vol. 12846, 1284608 (2024). **(INVITED)**
5. F. M. Eltigani, Z. Wang, Q. Liu, S. L. Wang, and **X. T. Su**, Label-free light scattering imaging of nanoscale small extracellular vesicles, **Proceedings of SPIE**, Vol. 12846, 1284605 (2024). **(INVITED)**
6. N. A. Mohamed, F. M. Eltigani, and **X. T. Su**, Noise effects on label-free nanoparticles classification using light scattering imaging and deep-learning algorithm, **Proceedings of SPIE**, Vol. 12770, 127701O (2023).
7. F. M. Eltigani, N. A. Mohamed and **X. T. Su**, Refractive index-based microparticle differentiation by light scattering imaging, **Proceedings of SPIE**, Vol. 12770, 127701N (2023).
8. Z. Li, K. X. Deng and **X. T. Su**, Light-sheet dual-modality imaging flow cytometry with a single detector for label-free particle analysis, **Proceedings of SPIE**, Vol. 12935, 1293504 (2023).
9. Z. Wang, A. S. Wang, Q Liu, S. L. Wang and **X. T. Su**, Label-free analysis of single microparticles and nanoscale exosomes with two-dimensional light scattering technology, **Proceedings of SPIE**, Vol. 12745, 35-40 (2023).
10. F. B. Yuan, Z.W. Wang, Q Liu and **X. T. Su**, Processing and analysis of motion-blur images in light scattering flow cytometry, **Proceedings of SPIE**, Vol. 12745, 266-271 (2023).
11. Z. Li, X.Y. Zhang, J. Peng and **X.T. Su**, Automatic Classification of Leukemic Cells by Label-Free Light-Sheet Flow Cytometry with Machine Learning, **2021 IEEE 6th Optoelectronics Global Conference (OGC)**, 217-220 (2021).
12. J.M. Xie, R. Chu, S.S. Liu, K. Song, and **X. T. Su**, Defocusing effects on label-free cervical cancer cell classification by two-dimensional light scattering static cytometry and machine learning, **Proceedings of SPIE**, Vol. 12067, 120670H (1-6) (2021).
13. X. Qi, Z. Wang and **X. T. Su**, Detection of microparticles in flow by 2D light scattering and fluorescence imaging, **Proceedings of SPIE**, Vol. 12057, 12057J(1-7) (2021).
14. X. Y. Su, T. Tao, Q. Li, Z. W. Wei*, and **X. T. Su***, A microfluidic cytometer with

- integrated on-chip optical systems for white blood cell analysis, **Proceedings of SPIE**, Vol. 11900, 119000J (2021).
15. Z. Li, G. S. Li, J. Peng, and X. T. Su, Light-sheet flow cytometry for label-free classification of acute and chronic myeloid leukemic cells with machine learning, **Proceedings of SPIE**, Vol. 11566, 1156614 (2020).
 16. J. H. Zhang, Z. H. Han, C. Z. Yuan, S. J. Liu, S. Yao, K. Song, and X. T. Su, Label-free characterization of cancerous ovarian tissues with continuous wave terahertz spectroscopy, **Proceedings of SPIE**, Vol. 11562, 115620V (2020).
 17. Z. Wang and X. T. Su, Differentiation of submicron particles with two-dimensional light scattering technology, **Proceedings of SPIE**, Vol. 11553, 115532C (2020).
 18. C. Liu, Q. Liu, and X. T. Su, High-content 2D light scattering flow cytometry for label-free classification of cervical carcinoma cells with deep learning, **Proceedings of SPIE**, Vol. 11553, 115532J (2020).
 19. J. Sun, L. Wang, Q. Liu, and X. T. Su, Automatic detection of leukemia cells by 2D light scattering microfluidic cytometry and deep learning, **Proceedings of SPIE**, Vol. 11190, 111901T (2019).
 20. S. Y. Zhang, M. A. Lin, and X. T. Su, Label-free light scattering microfluidic cytometry using dual-channel 3D hydrodynamic focusing, **Proceedings of SPIE**, Vol. 11190, 111902A (2019).
 21. M. A. Lin, S. Y. Zhang, Q. Liu, C. S. Shao, and X. T. Su, Label-free analysis of senescent cells by light sheet microfluidic cytometry with a disposable hydrodynamic focusing unit, **Proceedings of SPIE**, Vol. 11170, 1117043 (2019).
 22. S. J. Xu and X. T. Su, Simulation of light scattering from two-dimensional cells with finite-difference time-domain method, **2017 Chinese Automation Congress**, 5921-5924 (2017).
 23. L. Wang, L. Y. Xie, Q. Liu, C. S. Shao and X. T. Su, Automatic Characterization of Leukemic Cells with 2D Light Scattering Static Cytometry, **2017 Chinese Automation Congress**, 5925-5928 (2017).
 24. M. A. Lin and X. T. Su, 2D light scattering label-free cytometry using light-sheet illumination, **Proceedings of SPIE**, Vol. 10024, 100243I (2016).

25. L. Y. Xie, Q. Liu, C. S. Shao and **X. T. Su**, Development of wide-angle 2D light scattering static cytometry, **Proceedings of SPIE**, Vol. 10024, 100243N (2016).
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27. **X. T. Su**, Y. Yang, X.M. Sun, X. Qiao, K. Song and B. H. Kong, Miniaturized optofluidic label-free cytometry, **Photonics Global Conference (PGC)**, 2012 (INVITED).
28. X. Qiao, **X. T. Su**, X. H. Han and Y. W. Chen, A new linear coding algorithm for efficient multi-dimensional data representation without data expansion, **Information Science and Service Science and Data Mining (ISSDM)**, 2012.
29. X. M. Sun, X. Qiao, K. Song, B. H. Kong and **X. T. Su**, Speckle analysis of single cell light scattering patterns for cell classification, **Proceedings of SPIE**, Vol. 8412, 841207 (2012).
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31. **X. T. Su**, W. Rozmus and Y. Y. Tsui, A fiber-coupled microfluidic cytometer for the detection of nano-scale mitochondria information in single cells, **Proceedings of SPIE**, Vol. 7573, 75730K (2010).
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35. **X. T. Su**, W. Rozmus, C. Capjack and C. Backhouse, Side scatter light for micro-size differentiation and cellular analysis, **Proceedings of SPIE**, Vol. 6446, 64460w (2007).

Patents

(23 as first inventor)

1. **X. T. Su**, Z. W. Wang, Y. Zhang, Single-cell bioluminescent weak-light image processing method and system, **China 2025109233630**. (Inventor, applied)
2. **X. T. Su**, Y. Zhang, Z. Wang, K. Song, R. Chu, Method and apparatus for bioluminescent imaging flow cytometry, **China 2025109233626**. (Inventor, applied)
3. **X. T. Su**, X. Wang, Self-supervised image denoising and tracking analysis method of flowing nanoparticles, **China 2025109213798**. (Inventor, applied)
4. **X. T. Su**, Z. Wang, X. Wang, Apparatus and method for light scattering and spectral imaging of flowing nanoparticles, **China 2025109213800**. (Inventor, applied)
5. **X. T. Su**, J. W. Li, Z. H. Feng, Flow cytometric apparatus and method for single particle fluorescent spectra and label-free image multi-parameter measurements, **China 2025102347857**. (Inventor, applied)
6. **X. T. Su**, Z. Li, Method and system for the light scattering imaging modal expansion of label-free single cells, **China 2025101847460**. (Inventor, applied)
7. **X. T. Su**, F. M. Eltigani, Method and system for the intelligent classification of label-free cells based on dual-modality information, **China 2024105829486**. (Inventor, applied)
8. **X. T. Su**, Z. W. Wang, J. Zhou, Cell detection apparatus and method for supermultiplex imaging flow cytometry with single excitation source and single detector, **China 202410359289X**. (Inventor, applied)
9. **X. T. Su**, C. Liu, Method and system for label-free cell classification based on Siamese deep learning, **China 2024102037610**. (Inventor, applied)
10. **X. T. Su**, J.M. Xie, X. H. Liang, Fluorescence imaging and Raman spectra dual-modality detection instrument and methods for in situ single cells in tissue slice, **China 2023108249933**. (Inventor, applied)
11. **X. T. Su**, Z. Wang, Method, system and application for nanoparticle size calculation based

- on three-dimensional deep regression, **China 2023103941078**. (Inventor, applied)
12. **X. T. Su**, J.M. Xie, K. Song, S.S. Liu, R. Chu, Method and system for single-cell feature extraction and analysis, **China 202211012909.X**. (Inventor, applied)
 13. **X. T. Su**, Z. Wang, C. Liu, J. K. Jia, K. Song, H. Liu, A label-free cell classification and screening system based on hybrid transfer learning, **US 17/804.073**. (Inventor, issued)
 14. **X. T. Su**, Z. Zhao, Z. Li, A high-magnification optical imaging flow cytometer, **China 202210188547.3**. (Inventor, issued)
 15. **X. T. Su**, Z. W. Wang, An apparatus and method for label-free in-flow detection based on single-detector dual-modality imaging, **China 202210147793.4**. (Inventor, issued)
 16. **X. T. Su**, Z. Wang, X. Qi, Detection apparatus and methods for single particle multimodal in-flow imaging based on two dimensional light scattering, **China 202111241136.8**. (Inventor, applied)
 17. **X. T. Su**, Z. Wang, Deep learning based extracellular vesicles size analysis apparatus and methods, **China 202110948240.4**. (Inventor, issued)
 18. **X. T. Su**, C. Liu, Z. Wang, J. K. Jia, Transfer learning based label-free high-content video flow cytometer and methods, **China 202110592184.5**. (Inventor, issued)
 19. **X. T. Su**, Z. Wang, C. Liu, J. K. Jia, K. Song, H. Liu, Transfer learning based label-free cell classification system, **China 202110592201.5**. (Inventor, issued)
 20. **X. T. Su**, M. A. Lin, Label-free microfluidic cytometer and methods based on light-sheet illumination and sheath flow technology, **China 201810183035.1**. (Inventor, issued)
 21. **X. T. Su**, M. A. Lin, Q. Liu and X. Qiao, A novel apparatus and method for label-free cell detection based on light-sheet illumination, **China 201610890421.5**. (Inventor, issued)
 22. **X. T. Su**, S. S. Liu, and X. Qiao, A novel method for label-free pattern recognition cytometry, **China 201510649334.6**. (Inventor, issued)
 23. **X. T. Su**, X. Qiao, and X. Y. Xie, A novel method and apparatus for 2D light scattering static cytometry, **China 201510047187.5**. (Inventor, issued)

Books/Special Issues

1. Advances of cytometry in China, Special Issue, Cytometry Part A, Volume 8, 2022.

2. Multidisciplinary single-cell optical cytometry, Special Issue, Cytometry Part A, Volume 1, 2021.
3. Quantitative single-cell optical technologies, Special Issue, Cytometry Part A, Volume 6, 2021.
4. Prevalent cancers in Asia, Special Issue, Cytometry Part A, Volume 2, 2020.
5. Clinical Engineering, **X. T. Su (editorial committee member)**, ISBN 978-7-117-28398-4, People's Medical Publishing House, 2019.
6. Biomedical Engineering Technologies, **X. T. Su (associate editor)**, ISBN 978-7-5067-9377-3, China Medical Science Press, 2017.

Funding

Over 12M RMB (external).

- Principal investigator, "Development of fluorescence super-resolution and label-free long-time monitoring dual-modality microscopy for the visualization of cell-exosome interactions", Key Fundamental Research Funds of Nature Science Foundation of Shandong Province, 2025.01-2027.12, 1,600, 000 RMB.
- Principal investigator (Task of Shandong University, not the whole project), "Development of intelligent fully-automated flow cytometer for medical applications", National Key Research and Development Program, 2022.11-2027.10, 1,800, 000 RMB (Total for the project: 18,000,000 RMB).
- Principal investigator, "Development of flow-cytometry incorporated light scattering and fluorescence imaging apparatus and software system", Supported by the Instrument Improvement Funds of Shandong University Public Technology Platform, 2023.12-2025.11, 400, 000 RMB.
- Principal investigator, "Development of Intelligent dual-modality high-performance flow cytometry", Supported by the Fundamental Research Funds for the Central Universities, 2022.07-2024.06, 600, 000 RMB.
- Principal investigator, "Development of deep-learning based recognition method for multi-type cells", Industry Project, 2022.10-2024.09, 200, 000 RMB.

- Principal investigator, "Development of label-free high-throughput pattern recognition flow cytometry", Shandong Provincial Key Research and Development Program (Major Scientific and Technological Innovation Project), 2019.11-2022.12, 5, 000, 000 RMB.
- Principal investigator, "Imaging of exosomes in an integrated flow cytometer for early liver cancer detection", Major Research Plan (Training Program) of the National Natural Science Foundation of China, 2019.01-2021.12, 830, 800 RMB.
- Principal investigator, "Study of laser medical technology for early liver cancer detection based on exosomes-cell interaction", Advanced Medical Research Institute of Shandong University, 2019.07-2020.06, 100, 000 RMB.
- Principal investigator, "Development of wide-angle flow cytometry for label-free leukemia detection", General Research Program of the National Natural Science Foundation of Shandong Province, 2018.03-2021.06, 150, 000 RMB.
- Principal investigator (Platform and technology development), "Development of Innovative Technologies for Laser Medicine", Industrial Project, 2016.07-2018.08, 2, 000, 000 RMB.
- Principal investigator, "Study of light scattering method for cervical cancer early detection at single cell level", General Research Program of the National Natural Science Foundation of China, 2013.01-2016.12, 750, 000 RMB.
- Principal investigator, "Development of a light scattering cell sorter", The Project Sponsored by the Scientific Research Foundation for the Returned Overseas Chinese Scholars, State Education Ministry, 2012.07-2015.06, 40, 000 RMB.
- Principal investigator (Startup funding), "Qilu Youth Scholar Discipline Construction Funding", Shandong University, 2011.11-2015.10, 1, 000, 000 RMB.

Conference Services

- **Program Committee**, *The 39th annual Congress of the International Society for the Advancement of Cytometry*, Cyto 2026.
- **Chair**, *Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXIV (BO500)*, BIOS, SPIE Photonics West 2026.
- **Co-Chair**, *Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXIII*

(BO500), BIOS, SPIE Photonics West 2025.

- **Co-Chair**, *Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXII* (BO500), BIOS, SPIE Photonics West 2024.
- **Program Committee**, *The 36th annual Congress of the International Society for the Advancement of Cytometry*, Cyto 2023.
- **Co-Chair**, *Biophotonics and Optical Biomedicine*, Optoelectronics Global Conference (OGC) 2021, IEEE.
- **Sessional Chair**, *10th Applied Optics and Photonics China (AOPC 2021)*, Chinese Society for Optical Engineering (CSOE) and SPIE.
- **Co-Chair**, *Biomedical Photonics*, 2019 China Biomedical Engineering Conference.
- **Sessional Chair**, *Biophotonics and Laser Medicine*, The 14th National Conferences on Laser Technologies and Opto-electronics (LTO 2019).
- **Sessional Chair**, *Biomedical Photonics Diagnosis Techniques and Clinical Applications*, The 13th National Conferences on Laser Technologies and Opto-electronics (LTO 2018).

Honors and Awards

- First prize, 2023 Science and Technology Award of Shandong Biomedical Engineering Society.
- 2022 Excellent Provincial Society Worker Prize of Shandong Association for Science and Technology.
- First prize, 2021-2022 Science and Technology Award of Shandong Biomedical Engineering Society.
- Excellent Youth Prize at the 40th Anniversary of the Shandong Biomedical Engineering Society, 2022.
- 2021 Excellent Scientific and Technological Workers Prize of the Shandong Biomedical Engineering Society.
- 2021, Senior Member, Optica.
- 2020, Senior Member, SPIE.
- Qilu Youth Scholar Professorship, Shandong University, 2010-2016.

- First prize, TEC Edmonton Innovation Contest, Alberta, Canada, 2009.
- Honor of Excellent Graduate at Convocation 2000 of Shandong University, 2000.

Memberships

- Since 2022, Standing Committee member, Division of Cell Analysis, Chinese Society of Bio-engineering.
- Since 2021, Standing Committee member, Division of Biomedical Photonics, Chinese Society of Optics.
- Since 2021, Senior member, OSA.
- 2021, Taskforce member, Diversity, Equity, and Inclusion Task Force, International Society for the Advancement of Cytometry (ISAC).
- Since 2020, Committee member, Scientific Communications Committee, International Society for the Advancement of Cytometry (ISAC).
- Since 2020, Senior member, SPIE.
- 2019-2022, Committee member, Division of Cell Analysis, Chinese Society of Bio-engineering.
- 2018, Committee member, Working Committee on Youth, Chinese Society of Biomedical Engineering.
- Since 2017, Committee member, Division of Biomedical Measurements, Chinese Society of Biomedical Engineering.
- 2015-2021, Committee member, Division of Biomedical Photonics, Chinese Society of Biomedical Engineering.
- Since 2010, Member, the Optical Society (OSA).
- Since 2006, Member, the International Society for Optics and Photonics (SPIE).

Review Activities

- Grant reviewer for a list of funding agencies such as the European Research Council (ERC), National Natural Science Foundation of China (NSFC), National Natural Science Foundation of Beijing, the Project Sponsored by the Scientific Research Foundation for the Returned

Overseas Chinese Scholars (State Education Ministry).

- Reviewer for a list of journals such as Biomedical Optics Express, Optics Express, Photonics Research, Applied Optics, Cytometry Part A, Sensors and Actuators B: Chemical, Communications Biology, IEEE TBME, International Journal of Nanomedicine.

Supervision of Graduate Students

- Graduated PhD students: 7;
- Graduated Master of Engineering students: 29;
- Current PhD candidates: 10;
- Current Master of Engineering candidates: 10