

REASONS FOR NOMINATION

List reason(s) why your candidate merits election to the Europasche Akademie der Naturwissenschaften (European Academy of Natural Sciences). Explanations such as “The candidate is outstanding in his field” are not substantial. Evidence and examples should be given why the candidate is outstanding in his/her field. The first reason you give has to be a statement that can be used as citation describing the candidate’s excellence. For non-European candidates, provide evidence of sustained collaboration with European institutions and European centres of scholarship.

The rationale for Prof. Xueji Zhang’s nomination is his significant contribution to development of Artificial intelligent Sensors, free radical sensors and biosensors and biomedical instruments. As one of the most-prominent scientists in sensing technology worldwide, Zhang developed the first computerized free radical detection system including sensors, hardware and -software and the system was used world-wide. He has authored >700 papers and 180 patents. His contributions to biosensors, especially the nano-biosensing, cancer biomarkers detection, have evoked intense interest from both academia and industry. His invention has fostered over 10 high tech companies world widely. Zhang has also actively collaborated with many colleagues in Europe and is leading international collaborations at national level.

ACHIEVEMENTS

List important functions in academic or international bodies or in funding agencies, journals, conferences. List (most) important Prizes, Awards, and election into national Academies, but do not list irrelevant memberships in association, organisation, committees etc. These should be national and international prizes, or other honours, e.g. medals recognising sustained academia distinction; election to national Academies. Fellowships in scientific organisations and international associations etc. are not significant recognition.

2020-2023 Top World Scientist (0.2%) by Stanford University
2021 The Outstanding Contribution Award of Sensors in China
2020, Top Scientist, Nanjing, China
2019 Outstanding Scientist, Department of State, China
2019 Member of European Academy of Sciences
2018, Outstanding Talent, Shenzhen, China
2018, Natural Science Research Award (2018 Ministry of Education, China)
2018 The First prize of Science & technology, Chinese Association of Analysis and Testing
2017. National Award of Innovation & Research (2017, Central Government China),
2017 elected Fellow of the American Institute of Medical and Bioengineering (Washington, US),
2017, Capital Medal Beijing, China
2014. Fellow of Royal Society of Chemistry (London, UK),
2013. Academician of Russia Academy of Engineering (2013, Moscow, Russia),
2012. Distinguished Scholar Returned from Overseas (Beijing, China),
2009, National Chair Professorship by Central Government of P.R. China (the highest rank in China)
2009 Outstanding overseas Chinese by World Chinese Association
2007, GCAA Career Award, Gulf Coast Chinese American Association
1999-2009, Scientist of Year, World Precision Instruments Inc.
2003, International Scientist of the Year by International Biographical Center Cambridge, England
1999, recognized as "Extraordinary Scientist" at New Mexico State University by INS.
1997, Outstanding Overseas Chinese Scholar, Switzerland
1996, W.Simon Fellowship at ICSC-World Laboratory, Geneva, Switzerland

PUBLICATIONS

List the candidate's major and most recent publications and provide evidence of (scientific) impact where available or appropriate.

Research Funding:

Current

Intelligent Sensors Major Project ---Fast Covid-19 virus detection (2013.3-2025.12) 90 Million

Minister of Science & Technology, China

PI: Xueji Zhang

Research Found for Excellent of Research Team in Shenzhen on Intelligent Sensors Development(Peacock Team) 15 million

PI: Xueji Zhang

Wearable Intelligent Biosensors—Theory and Application(2023.1-2027.12) ¥3 Millions

National Natural Science Foundation of China

PI; Xueji Zhang

The role and mechanism of reactive oxygen species and reactive nitrogen species in COVID-19 pathogenesis , (2021.1-2022.12) ¥ 1.5 million

National Natural Science Foundation of China

PI; Xueji Zhang

Selective and Fast detection of Cancer biomarkers, (2019.1-2013.12) ¥ 20 million(\$3M)

National Natural Science Foundation of China

PI; Xueji Zhang

Multiple dimension analysis system for single cell (2018.1.-2022.12.) ¥ 7.2 million(\$1M)

National Natural Science Foundation of China

PI; Xueji Zhang

Completed:

111 project (MOE) 9 M, PI: (2018.1.2022.12) PI: Xueji Zhang

China Capital International Institute Platform, (2017.01-2021.12) 100 M PI Xueji Zhang

Integration of microfluid chip and nuclei masspec and its application for precision cancer diagnostic, National key project, MOST(2016-7-2018.12) 24 M Yuan. PI: Xueji Zhang

microRNA regulates Cancer cells treated by As₂O₃, (01-2015-12-2018) , NSFC, 1 M, PI:Xueji Zhang

Nano functional materials and sensing device,(2014.1-2018.12) Minister of Education Fund, 4.5 M , Co-PI

MicroRNA detection based on novel nanodevice, Beijing Science and Technology Committee fund, 500 K, PI

Nano-selective and sensitive NO probes for single cell monitoring (01-2013-12-2016) 800KYUAN National Natural Science Foundation of China. PI; Xueji Zhang

High resolution Scanning Electrochemical Microscopy(01-2012-12-2015)4 million YUAN(\$600 K)National Science Foundation of China. PI: Xueji Zhang

1000 Chinese Elites Program (07-2011-06-2016) Total 20 million YUAN (~\$3 million), Supported by Chinese Central Government. PI: Xueji Zhang

National Key Project on Biosensing Platform(01-2010-12-2014) Total 20 million YUAN (~\$3 million).
PI: Xueji Zhang

Functional Materials and Sensing devices, Beijing City (01-2011-21-31.2015).
Co-PI

A NO detection system for clinical trial. Contract from New York Biomedical Inc. (11-01-2008-12-31-2010).
PI: Xueji Zhang

Ultramicrosensors and Biomedical Sensors for Space Shuttle. European Space Agency, (01-01-2007-12-31-2009).PI: Xueji Zhang

Micro hydrogen sulfide sensor for clinical application R&D fund from Akria. (02-01-2008-12-31-2009).

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Portable Free Radical Detection System, R&D Funds from WPI, (01-01-2006 to 12-31-2008)
PI: Xueji Zhang

Electrochemical measurement of homocysteine for clinical application. R&D Funds from WPI, (01-01-2006 to 12-31-2008) Cooperation with Formosa Plastics Company.
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New generation of NO sensors with pM detection limit based on Nanotechnology, R&D Funds from WPI, (07-01-2006 to 12-31-2008)
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Apollo-4000 System, R&D Funds from WPI, (10-1-2001 to 9-30-2006)
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Novel electrochemical detector with nanoliter dead volume for HPLC, (Jan. 2004-Dec. 2005)
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Electrochemical Measurement of S-Nitrosothiols, NIH grant 5R44GM062077-03, Phase II, (4-01-03 to 3-31-2004).
PI: Xueji Zhang

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PI: Xueji Zhang

New generation nitric oxide electrochemical sensors, R&D Funds from WPI, (01-01-2000 to 12-31-2002)

PI: Xueji Zhang

Nanometer Sized Ultramicroelectrodes and Their Application for Single Cell Measurements, National Natural Science Foundation of China, (1994-1997)

PI: Xueji Zhang

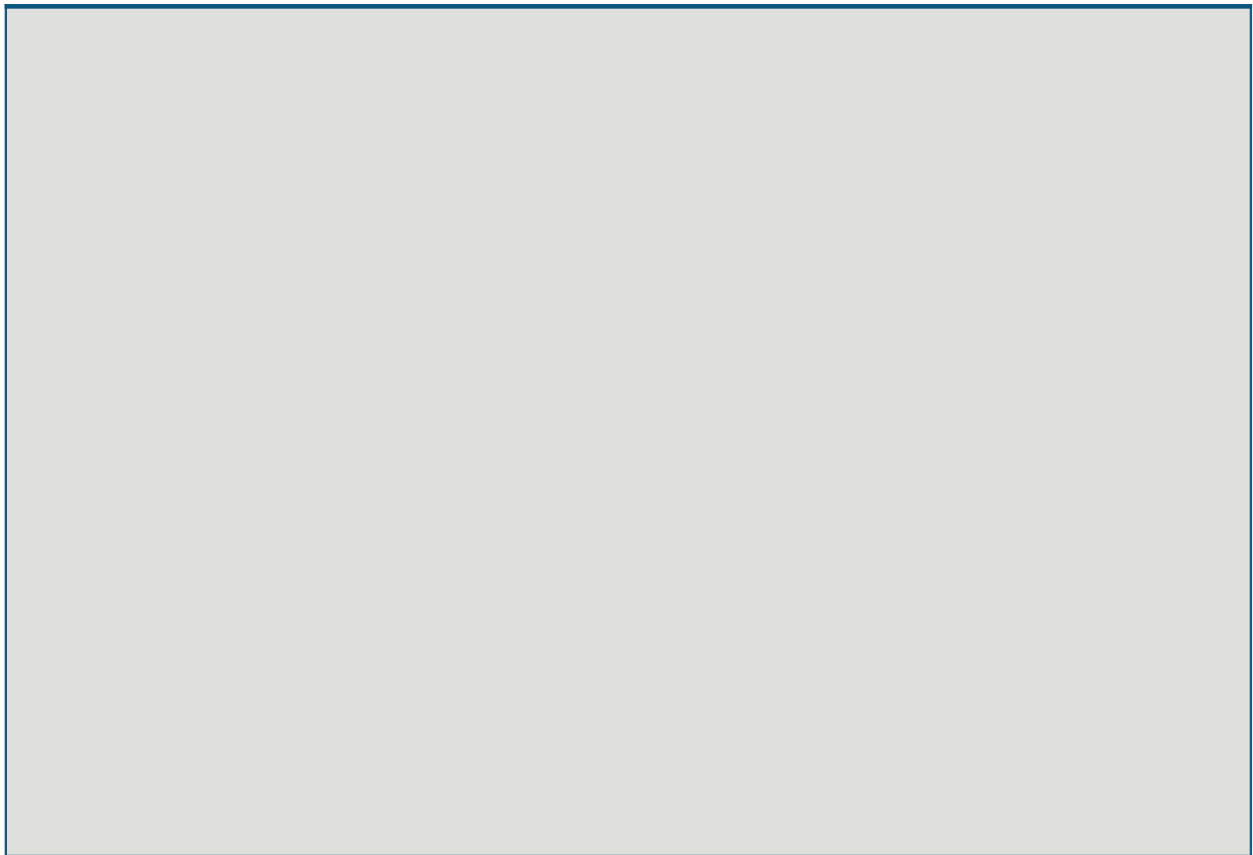
Novel New Ion-Selective Microelectrodes, Research fund from ICSC-WORLD Laboratory (05-01-1997 to 04-30-1998)

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High Resolution Oxygen Sensor, R&D fund from Oxygraph, (12-01 2002 to 05-01-2003)

PI: Xueji Zhang

Co-investigator with Professors Joseph Wang, Usular Spichger, Bozidar Ogorevc on NIH RO1, Swiss Science Foundation, NATO for Biosensors



BIOGRAPHY WITH PHOTO:



Dr. Xueji Zhang is vice president of Shenzhen University, Professor in the School of Biomedical Engineering at Shenzhen University, P.R. China. He is also professor at Univ. of Sci. & Technol Beijing, and executive president of National Institute of Precision Medicine & Health, Beijing. He received his BSc. and Ph.D. from Wuhan University in 1989 and 1994, respectively. His postdoctoral work was completed at National Institute of Chemistry, Slovenia, Swiss Federal Institute of Technology, Zurich and New Mexico State University, Las Cruces, USA from 1995-1999. He was a research scientist, Sr. scientist, chief scientist, Vice President and Sr. Vice President at World Precision Instruments, Inc. USA until 2010, when he joined USTB as National Chair Professor. His research interests span the disciplines of chemistry, biology, materials and medicine with an emphasis on studies of biosensing,

biomedicine and biomaterials. His lab focuses on the development of novel biosensors, tools and devices to study free radicals, cancer biomarkers, profiling changes in animal or human associated with diseases and exploiting this information for development of diagnostic and therapeutic approaches. In addition, his group investigates drug delivery, new energy and natural medicines. He serves as the chief editor of Sensors & Diagnostics, Am of Biomed Sci and has been editorial member of 24 international journals. He has received numerous national and international awards and honors including Member of Russian Academy of Engineering, Fellow of American Institute for Medical & Bioengineering, Fellow of Royal Chemical Society, National Innovation Award, China, Scientist of Year in China, and Simon Fellow of ICSC-World Lab. He has authored over 7000 papers, 8 books and over 180 patents and devel.

PROJECT MANAGEMENT, GRANTS OR FUNDING RECEIVED:

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Co-investigator with Professors Joseph Wang, Usular Spichger, Bozidar Ogorevc on NIH
RO1, Swiss Science Foundation, NATO for Biosensors

HONORS AND AWARDS:

2020-2023 Top World Scientist (0.2%) by Stanford University

2021 The Outstanding Contribution Award of Sensors in China

2020, Top Scientist, Nanjing, China

2019 Outstanding Scientist, Department of State, China

2019 Member of European Academy of Sciences

2018, Outstanding Talent, Shenzhen, China

2018, Natural Science Research Award (2018 Ministry of Education, China)

2018 The First prize of Science & technology, Chinese Association of Analysis and Testing

2017. National Award of Innovation & Research (2017, Central Government China),

2017 elected Fellow of the American Institute of Medical and Bioengineering (Washington,
US),

2017, Capital Medal Beijing, China

2017 Outstanding Engineer Award in China

2014. Scientist of the Year, China (Beijing),

2014. Fellow of Royal Society of Chemistry (London, UK),

2013. Academician of Russia Academy of Engineering (2013, Moscow, Russia),

2012. Distinguished Scholar Returned from Overseas (Beijing, China),

2012. Excellent Teacher Award of USTB (2012-2019, Beijing),

2010, Membership of Cambridge Who's Who of Distinguished Individuals

2009, National Chair Professorship by Central Government of P.R. China (the highest rank in
China)

2009 Outstanding overseas Chinese by World Chinese Association

2007, GCAA Career Award, Gulf Coast Chinese American Association

1999-2009, Scientist of Year, World Precision Instruments Inc.

2003, International Scientist of the Year by International Biographical Center Cambridge, England

1999, recognized as “Extraordinary Scientist” at New Mexico State University by INS.

1997, Outstanding Overseas Chinese Scholar, Switzerland

1996, W.Simon Fellowship at ICSC-World Laboratory, Geneva, Switzerland

1994, The First Prize of the National Applied Science and Technology and Invent for All College Students, Graduates and PhD Candidate in China. (Only 4 Awards in China)

1994, The first Prize of Scientific papers in Hubei Province, China

FULL PUBLICATIONS LIST:

1. Zhou, M.; Luo, Y.; Wang, L.; Fan, C.; Xu, T.; Zhang, X., Integrated microdroplet array platform with temperature controller and micro-stirring for ultra-fast SARS-CoV-2 detection. *Biosens. Bioelectron.* **2023**, *220*, 114903-114903.
2. Zhang, Y. B.; Chen, Y.; Zhang, Q. L.; Liu, Y. Z.; Zhang, X. J., An aM-level sensitive cascade CRISPR-Dx system (ASCas) for rapid detection of RNA without pre-amplification. *Biosens. Bioelectron.* **2023**, *230*.
3. Zhang, W. X.; Miao, J. L.; Tian, M. W.; Zhang, X. J.; Fan, T. T.; Qu, L. J., Hierarchically interlocked helical conductive yarn enables ultra-stretchable electronics and smart fabrics. *Chem. Eng. J.* **2023**, *462*.
4. Zhang, S.; Wang, L.; Xu, T.; Zhang, X., Luminescent MOF-Based Nanofibers with Visual Monitoring and Antibacterial Properties for Diabetic Wound Healing. *ACS Appl. Mater. Interfaces* **2023**.
5. Yu, K.; Li, M.; Chai, H.; Liu, Q.; Hai, X.; Tian, M.; Qu, L.; Xu, T.; Zhang, G.; Zhang, X., MOF-818 nanozyme-based colorimetric and electrochemical dual-mode smartphone sensing platform for in situ detection of H₂O₂ and H₂S released from living cells. *Chem. Eng. J.* **2023**, *451*.
6. Yang, X. Y.; Guo, C. H.; Zhang, Q. L.; Chen, Y.; Liu, Y. Z.; Zhang, X. J., A portable thermostatic molecular diagnosis device based on high-efficiency photothermal conversion material for rapid field detection of SARS-CoV-2. *Talanta* **2023**, *258*.
7. Yang, S.; Du, J.; Wei, M.; Huang, Y.; Zhang, Y.; Wang, Y.; Li, J.; Wei, W.; Qiao, Y.; Dong, H.; Zhang, X., Colorimetric-photothermal-magnetic three-in-one lateral flow immunoassay for two formats of

biogenic amines sensitive and reliable quantification. *Anal. Chim. Acta* **2023**, 1239.

8. Yang, F.; Lu, H. T.; Meng, X. D.; Li, L. P.; Dai, W. H.; Yang, L. Z.; Zhang, R. P.; Dong, H. F.; Zhang, X. J., Rational engineering of nucleic acid probe system for enhanced intracellular MicroRNA detection. *Coord. Chem. Rev.* **2023**, 487.

9. Yan, T. Y.; Zhang, G. Y.; Yu, K.; Chai, H. N.; Tian, M. W.; Qu, L. J.; Dong, H. F.; Zhang, X. J., Smartphone light-driven zinc porphyrinic MOF nanosheets-based enzyme-free wearable photoelectrochemical sensor for continuous sweat vitamin C detection. *Chem. Eng. J.* **2023**, 455.

10. Xu, R. D.; She, M. H.; Liu, J. X.; Zhao, S. K.; Zhao, J. S.; Zhang, X. J.; Qu, L. J.; Tian, M. W., Skin-Friendly and Wearable Iontronic Touch Panel for Virtual-Real Handwriting Interaction. *ACS Nano* **2023**, 17 (9), 8293-8302.

11. Xu, D. Q.; An, X.; Wang, Y. Y.; Qian, L. S.; Qiu, W. W.; Zhang, X. J.; Liu, G. D., Ultrasensitive lateral flow biosensor based on PtAu@CNTs nanocomposite catalytic chromogenic signal amplification strategy for the detection of nucleic acid. *Anal. Chim. Acta* **2023**, 1260.

12. Xing, Y.; Zhou, M. Y.; Liu, X. M.; Qiao, M. H.; Zhou, L. P.; Xu, T. L.; Zhang, X. J.; Du, X., Bioinspired Jellyfish-like Carbon/Manganese nanomotors with H₂O₂ and NIR light Dual-propulsion for enhanced tumor penetration and chemodynamic therapy. *Chem. Eng. J.* **2023**, 461.

13. Xing, Y.; Xiu, J. D.; Zhou, M. Y.; Xu, T. L.; Zhang, M. Q.; Li, H.; Li, X. Y.; Du, X.; Ma, T. Y.; Zhang, X. J., Copper Single-Atom Jellyfish-like Nanomotors for Enhanced Tumor Penetration and Nanocatalytic Therapy. *ACS Nano* **2023**.

14. Xiao, J. Y.; Wang, J.; Luo, Y.; Xu, T. L.; Zhang, X. J., Wearable Plasmonic Sweat Biosensor for Acetaminophen Drug Monitoring. *Acs Sensors* **2023**, 8 (4), 1766-1773.

15. Wang, M.; Wang, J.; Ma, N.; Yu, S. B.; Kong, J. M.; Zhang, X. J., A novel colorimetric detection of glutathione based on stable free radical TEMPO oxidation of 3,3',5,5' tetramethylbenzidine (TMB) via Copper(II) acetylacetonate catalysis. *Spectrochimica Acta Part a-Molecular and Biomolecular Spectroscopy* **2023**, 285.

16. Wang, M.; Wang, J.; Ma, N.; Yu, S.; Kong, J.; Zhang, X., A novel colorimetric detection of glutathione based on stable free radical TEMPO oxidation of 3,3',5,5'-tetramethylbenzidine (TMB) via Copper(II) acetylacetonate catalysis. *Spectrochimica acta. Part A, Molecular and biomolecular spectroscopy* **2023**, 285, 121875-121875.

17. Wang, L. R.; Wang, J.; Fan, C.; Xu, T. L.; Zhang, X. J., Skin-like hydrogel-elastomer based electrochemical device for comfortable wearable biofluid monitoring. *Chem. Eng. J.* **2023**, 455.

18. Sun, Y. F.; Zhou, Z. P.; Peng, P. W.; Shu, T.; Su, L.; Zhang, X. J., Protein-Directed Au(0)-Rich Gold Nanoclusters as Ratiometric Luminescence Sensors for Auric Ions via Comproportionation- Induced Emission Enhancement. *Anal. Chem.* **2023**, 95 (14), 5886-5893.

19. Sun, H. B.; Liu, J. L.; Kong, J. M.; Zhang, J.; Zhang, X. J., Ultrasensitive miRNA-21 Biosensor Based on Zn(TCPP) PET-RAFT Polymerization Signal Amplification and Multiple Logic Gate Molecular Recognition. *ACS Appl. Mater. Interfaces* **2023**, 15 (14), 17716-17725.

20. Meng, X.; Sun, S.; Gong, C.; Yang, J.; Yang, Z.; Zhang, X.; Dong, H., Ag-Doped Metal-Organic Frameworks' Heterostructure for Sonodynamic Therapy of Deep-Seated Cancer and Bacterial Infection.

ACS Nano **2023**, *17* (2), 1174-1186.

21. Meng, J.-R.; Liu, J.; Fu, L.; Shu, T.; Yang, L.; Zhang, X.; Jiang, Z.-H.; Bai, L.-P., Anti-Entry Activity of Natural Flavonoids against SARS-CoV-2 by Targeting Spike RBD. *Viruses* **2023**, *15* (1).
22. Ma, N.; Zhao, Y.; Li, L.; Kong, J.; Zhang, X., Ferritin-Enhanced Direct MicroRNA Detection via Controlled Radical Polymerization. *Anal. Chem.* **2023**, *95* (2), 1273-1279.
23. Luo, Y. F.; Abidian, M. R.; Ahn, J. H.; Akinwande, D.; Andrews, A. M.; Antonietti, M.; Bao, Z. N.; Berggren, M.; Berkey, C. A.; Bettinger, C. J.; Chen, J.; Chen, P.; Cheng, W. L.; Cheng, X.; Choi, S. J.; Chortos, A.; Dagdeviren, C.; Dauskardt, R. H.; Di, C. A.; Dickey, M. D.; Duan, X. F.; Facchetti, A.; Fan, Z. Y.; Fang, Y.; Feng, J. Y.; Feng, X.; Gao, H. J.; Gao, W.; Gong, X. W.; Guo, C. F.; Guo, X. J.; Hartel, M. C.; He, Z. H.; Ho, J. S.; Hu, Y. F.; Huang, Q. Y.; Huang, Y.; Huo, F. W.; Hussain, M. M.; Javey, A.; Jeong, U.; Jiang, C.; Jiang, X. Y.; Kang, J. H.; Karnaushenko, D.; Khademhosseini, A.; Kim, D. H.; Kim, I. D.; Kireev, D.; Kong, L. X.; Lee, C.; Lee, N. E.; Lee, P. S.; Lee, T. W.; Li, F. Y.; Li, J. X.; Liang, C. Y.; Lim, C. T.; Lin, Y. J.; Lipomi, D. J.; Liu, J.; Liu, K.; Liu, N.; Liu, R.; Liu, Y. X.; Liu, Y. X.; Liu, Z. Y.; Liu, Z. J.; Loh, X. J.; Lu, N. S.; Lv, Z. S.; Magdassi, S.; Malliaras, G. G.; Matsuhisa, N.; Nathan, A.; Niu, S. M.; Pan, J. M.; Pang, C. H.; Pei, Q. B.; Peng, H. S.; Qi, D. P.; Ren, H. Y.; Rogers, J. A.; Rowe, A.; Schmidt, O. G.; Sekitani, T.; Seo, D. G.; Shen, G. Z.; Sheng, X.; Shi, Q. F.; Someya, T.; Song, Y. L.; Stavriniidou, E.; Su, M.; Sun, X. M.; Takei, K.; Tao, X. M.; Tee, B. C. K.; Thean, A. V. Y.; Trung, T. Q.; Wan, C. J.; Wang, H. L.; Wang, J.; Wang, M.; Wang, S. H.; Wang, T.; Wang, Z. L.; Weiss, P. S.; Wen, H. Q.; Xu, S.; Xu, T. L.; Yan, H. P.; Yan, X. Z.; Yang, H.; Yang, L.; Yang, S. J.; Yin, L.; Yu, C. J.; Yu, G. H.; Yu, J.; Yu, S. H.; Yu, X. E.; Zamburg, E.; Zhang, H. X.; Zhang, X. Y.; Zhang, X. S.; Zhang, X. J.; Zhang, Y. H.; Zhang, Y.; Zhao, S. Y.; Zhao, X. H.; Zheng, Y. J.; Zheng, Y. Q.; Zheng, Z. J.; Zhou, T.; Zhu, B. W.; Zhu, M.; Zhu, R.; Zhu, Y. Z.; Zhu, Y.; Zou, G. J.; Chen, X. D., Technology Roadmap for Flexible Sensors. *ACS Nano* **2023**, *17* (6), 5211-5295.
24. Luo, Y.; Zhou, M. Y.; Fan, C.; Song, Y. C.; Wang, L. R.; Xu, T. L.; Zhang, X. J., Active Enrichment of Nanoparticles for Ultra-Trace Point-of-Care COVID-19 Detection. *Anal. Chem.* **2023**, *95* (12), 5316-5322.
25. Liu, Z. W.; Ma, N.; Yu, S. B.; Kong, J. M.; Zhang, X. J., Hemin-catalyzed SI-RAFT polymerization for thrombin detection. *Microchem. J.* **2023**, *189*.
26. Li, Y. Y.; Cong, Z. Q.; Xie, L. M.; Tang, S. S.; Ren, C. Y.; Peng, X. Q.; Tang, D. T.; Wan, F. C.; Han, H.; Zhang, X. J.; Gao, W.; Wu, S., Magnetically Powered Immunogenic Macrophage Microrobots for Targeted Multimodal Cancer Therapy. *Small* **2023**.
27. Li, Y.-X.; Li, J.; Zeng, H.-B.; Zhang, X.-J.; Cosnier, S.; Shan, D., Artificial Light-Harvesting System Based on Zinc Porphyrin and Benzimidazole: Construction, Resonance Energy Transfer, and Amplification Strategy for Electrochemiluminescence. *Anal. Chem.* **2023**, *95* (6), 3493-3498.
28. Li, W.; Li, J.; Xie, Y.; Tan, Y.; Wang, H.; Su, L.; Zhang, X., A facile method based on a superabsorbent polymer composite for concentration and separation of exosomes from cell culture media. *Polym. Chem.* **2023**, *14* (5), 542-546.
29. Li, T.; Zhu, X. Y.; Hai, X.; Bi, S.; Zhang, X. J., Recent Progress in Sensor Arrays: From Construction Principles of Sensing Elements to Applications. *Acs Sensors* **2023**, *8* (3), 994-1016.

30. Ji, Z. L.; Zhao, J. Y.; Liu, J. Y.; Zeng, X. Y.; Zhang, H. Y.; Zhang, X. J.; Ganchev, I., ELCT-YOLO: An Efficient One-Stage Model for Automatic Lung Tumor Detection Based on CT Images. *Mathematics* **2023**, *11* (10).
31. Huang, Y.; Zhang, Y.; Hao, W.; Lu, H.; Dong, H.; Zhang, X., Sensitive microRNA detection based on bimetallic label photothermal lateral flow locked nucleic acid biosensor with smartphone readout. *Sens. Actuator B Chem.* **2023**, *375*.
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