Curriculum Vitae

Wei Tao Huang, Ph.D, Associate professor

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Biography

2005.9-2009.7	B.S. in chemistry	Jishou University, China
2009.9-2014.6	Ph.D. in Analytical/Physical Chemistry (Supervised by Prof. Nian Bing Li and Prof. Hong Qun Luo)	Southwest University, China
2011.8	Physical Chemistry: 2011 Summer School for Graduate Students (Guangdong)	South China Normal University, China
2012.7	2012 BNU Summer School for Complex Systems	Beijing Normal University, China
2014.7-present	Associate professor	State Key Laboratory of Developmental Biology of Freshwater Fish, Hunan Normal University, China

Awards and Honors

2021	Hunan Optical Science and Technology Progress Award
2020	Training objects of Young backbone Teachers in Colleges and Universities in Hunan Province
2019	The society for microbiology in hunan province top ten youth awards
2017	Outstanding youth in Changsha
2016	Advanced individuals of science and technology society of Hunan province
2011	Outstanding Young Talent for Physical Chemistry and the First Prize Scholarship

Research interests

Molecular information technology based on self-assembly and molecular recognition

Artificial molecular neuron for large-scale logic computation in batch mode, information encoding, storage, hiding and security (molecular steganography and cryptography)

Logic and intelligent (Boolean or Fuzzy logic) sensing based on molecular information processing.

Programmable intelligent materials or systems (such as based DNA, peptide) for intelligent sensing, disease diagnosis, drug delivery, and molecular games.

Fusion of molecular programmable materials or systems and modern information manufacturing technology

for advanced function materials or systems

Biochemical Sensing and Imaging for disease diagnosis and environmental monitoring

Combination of DNA/peptide and nanomaterials (such as graphene oxide) for fabrication of biosensing and imaging

IoT biosensor: digital and portable biosensors or devices based on open source Arduino

Selected Publications

2023

[1] Liu, Q. Y.; Wu, Y.; Bu, Z. Q.; Quan, M. X.; Lu, J. Y.; **Huang, W. T.***, Sequential-dependent synthesis of bimetallic silver-chromium nanoparticles for multi-channel sensing, logic computing, and 3 in 1 information protection. *Small* **2023,** *Just Accepted*, DOI: 10.1002/smll.202207436.

[2] Wu, Y.; Yu Liu, Q.; Qi Bu, Z.; Xia Quan, M.; Yang Lu, J.; **Tao Huang, W.***, Colorimetric multi-channel sensing of metal ions and advanced molecular information protection based on fish scale-derived carbon nanoparticles. *Spectrochim. Acta, Part A* **2023,** *290*, 122291.

2022

[3] Lu, J. Y. *; Bu, Z. Q.; **Huang, W. T.***, Peptide-based sensing of Pb2+, molecular logic computing, information encoding, cryptography, and steganography. Microchem. J. 2023, 184, 108198.

[4] Jiao Yang Lu*, Quan Jiang, Jiao Jiao Lei, Ying Xuan He, **Wei Tao Huang***, Molecular 'email': Electrochemical aptasensing of fish pathogens, molecular information encoding, encryption and hiding applications, Analytica Chimica Acta, 2022, 1232, 340483.

[5] Liu, Q. Y.; Bu, Z. Q.; Quan, M. X.; Wu, Y.; Ding, X.; Xia, L. Q.; Lu, J. Y.; **Huang, W. T.***, A molecular paradigm: "Plug-and-play" chemical sensing and crypto-steganography based on molecular recognition and selective response. *Biosens. Bioelectron.* **2022,** *209*, 114260.

[6] Quan, M. X.; Yao, Q. F.; Liu, Q. Y.; Bu, Z. Q.; Ding, X. Z.; Xia, L. Q.; Lu, J. Y.; **Huang, W. T.***, Microwave-Assisted Synthesis of Silver Nanoparticles for Multimode Colorimetric Sensing of Multiplex Metal Ions and Molecular Informatization Applications. *ACS Appl. Mater. Interfaces* **2022**, *14* (7), 9480–9491.

[7] Bu, Z. Q.; Yao, Q. F.; Liu, Q. Y.; Quan, M. X.; Lu, J. Y.; **Huang, W. T.***, Peptide-Based Sensing, Logic Computing, and Information Security on the Antimonene Platform. *ACS Appl. Mater. Interfaces* **2022,** *14* (6), 8311-8321.

[8] Lu, J. Y.; Zhang, F. R.; Ding, X. Z.; Xia, L. Q.; **Huang, W. T.***, Natural interface guiding cell: Directly using waste fish scales with rich micro/nano structures for control of cell behaviors. *Appl. Surf. Sci.* **2022,** *581*, 152348.

2021

[9] Yao, Q. F.; Quan, M. X.; Yang, J. H.; Liu, Q. Y.; Bu, Z. Q.; **Huang, W. T.***, Multifunctional Carbon Nanocomposites as Nano-Neurons from Multi-Mode and Multi-Analyte Sensing to Molecular Logic Computing, Steganography and Cryptography. *Small* **2021,** *17* (50), 2103983.

[10] Yao, Q. F.; Zhu, Q. Y.; Bu, Z. Q.; Liu, Q. Y.; Quan, M. X.; **Huang, W. T.***, DNA nanosensing systems for tunable detection of metal ions and molecular crypto-steganography. *Biosens. Bioelectron.* **2021,** *195*, 113645.

[11] Liu, Q. Y.; Bu, Z. Q.; Yao, Q. F.; Ding, X.; Xia, L. Q.; **Huang, W. T.***, Microwave-Assisted Synthesis of Chromium Oxide Nanoparticles for Fluorescence Biosensing of Mercury Ions and Molecular Logic Computing. *ACS Applied Nano Materials* **2021,** *4* (7), 7086-7096.

2020

[12] Yao, Q. F.; Zhou, D. S.; Yang, J. H.; **Huang, W. T.***, Directly reusing waste fish scales for facile, large-scale and green extraction of fluorescent carbon nanoparticles and their application in sensing of ferric ions. *Sustain Chem Pharm* **2020,** *17*, 100305.

2019

[13] Zhu, Q. Y.; Zhang, F. R.; Du, Y.; Zhang, X. X.; Lu, J. Y.; Yao, Q. F.; **Huang, W. T.***; Ding, X. Z.; Xia, L. Q.,

Graphene-Based Steganographically Aptasensing System for Information Computing, Encryption and Hiding, Fluorescence Sensing and in Vivo Imaging of Fish Pathogens. *ACS Appl. Mater. Interfaces* **2019,** *11* (9), 8904-8914.

[14] Zhang, X. X.; Zhu, Q. Y.; Lu, J. Y.; Zhang, F. R.; **Huang, W. T.***; Ding, X. Z.; Xia, L. Q., The Boolean logic tree of molecular self-assembly system based on cobalt oxyhydroxide nanoflakes for three-state logic computation, sensing and imaging of pyrophosphate in living cells and in vivo. *Analyst* **2019,** *144* (1), 274-283.

[15] Zhang, F. R.; Lu, J. Y.; Yao, Q. F.; Zhu, Q. Y.; Zhang, X. X.; **Huang, W. T.***; Xia, L. Q.; Ding, X. Z., Matter, energy and information network of a graphene-peptide-based fluorescent sensing system for molecular logic computing, detection and imaging of cancer stem cell marker CD133 in cells and tumor tissues. *Analyst* **2019,** *144* (6), 1881-1891.

2018

[16] Nie, N. F.; Zhang, X. X.; Fang, C. S.; Zhu, Q. Y.; Lu, J. Y.; Zhang, F. R.; Yao, Q. F.; **Huang, W. T.***; Ding, X. Z.; Xia, L. Q., Game Theory in Molecular Nanosensing System for Rapid Detection of Hg2+ in Aqueous Solutions. *Applied Sciences* **2018,** *8* (12), 2530.

[17] Lu, J. Y.; Zhu, Q. Y.; Zhang, X. X.; Zhang, F. R.; **Huang, W. T.***; Ding, X. Z.; Xia, L. Q.; Luo, H. Q.; Li, N. B., Directly repurposing waste optical discs with prefabricated nanogrooves as a platform for investigation of cell-substrate interactions and guiding neuronal growth. *Ecotoxicol. Environ. Safe* **2018,** *160*, 273-281.

[18] Lu, J. Y.; Zhang, X. X.; Zhu, Q. Y.; Zhang, F. R.; **Huang, W. T.***; Ding, X. Z.; Xia, L. Q.; Luo, H. Q.; Li, N. B., Highly Tunable and Scalable Fabrication of 3D Flexible Graphene Micropatterns for Directing Cell Alignment. *ACS Appl. Mater. Interfaces* **2018,** *10* (21), 17704-17713.

2017

[19] Lu, J. Y.; Zhang, X. X.; **Huang, W. T.***; Zhu, Q. Y.; Ding, X. Z.; Xia, L. Q.; Luo, H. Q.; Li, N. B., Boolean Logic Tree of Label-Free Dual-Signal Electrochemical Aptasensor System for Biosensing, Three-State Logic Computation, and Keypad Lock Security Operation. *Anal. Chem.* **2017,** *89* (18), 9734-9741.

[20] **Huang, W. T.**; Chen, L. X.; Lei, J. L.; Luo, H. Q.; Li, N. B., Molecular neuron: From sensing to logic computation, information encoding, and encryption. *Sens. Actuator B-Chem.* **2017,** *239*, 704-710.

2011-2014

[21] **Huang, W. T.**; Zhang, J. R.; Xie, W. Y.; Shi, Y.; Luo, H. Q.; Li, N. B., Fuzzy logic sensing of G-quadruplex DNA and its cleavage reagents based on reduced graphene oxide. *Biosens. Bioelectron.* **2014,** *57*, 117-124.

[22] **Huang, W. T.**; Luo, H. Q.; Li, N. B., Boolean Logic Tree of Graphene-Based Chemical System for Molecular Computation and Intelligent Molecular Search Query. *Anal. Chem.* **2014,** *86* (9), 4494-4500.

[23] **Huang, W. T.**; Xie, W. Y.; Shi, Y.; Luo, H. Q.; Li, N. B., A simple and facile strategy based on Fenton-induced DNA cleavage for fluorescent turn-on detection of hydroxyl radicals and Fe2+. *J. Mater. Chem.* **2012,** *22* (4), 1477-1481.

[24] **Huang, W. T.**; Shi, Y.; Xie, W. Y.; Luo, H. Q.; Li, N. B., A reversible fluorescence nanoswitch based on bifunctional reduced graphene oxide: use for detection of Hg2+ and molecular logic gate operation. *Chem. Commun.* **2011,** *47* (27), 7800-7802.

Research Grants----Current

Application of DNA nanotechnology in data storage and protection (Nos. kq2208170 and 22B0040)	2022-2024

Research Grants----Recent Past

National Natural Science Foundation of China (No. 21505042)	2016-2018
Hunan Provincial Natural Science Foundation of China (No. 2016JJ3084)	2016-2018
Scientific and Technological Plan Project of Changsha of China (Nos. KQ1707010 and KQ1802046)	2017-2022