

Bioinspiration/Cellulose/Biomass/Fiber

(2022-2025)

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Bioinspiration

1. Plant Cell Wall-Like Soft Materials: Micro- and Nanoengineering, Properties, and Applications (Review)

Roya Koshani, Mica L. Pitcher, Jingyi Yu, Christine L. Mahajan, Seong H. Kim & Amir Sheikhi
Nano-Micro Lett. 17, 103 (2025). <https://doi.org/10.1007/s40820-024-01569-0>

2. Lessons from Nature: Advances and Perspectives in Bionic Microwave Absorption Materials (Review)

Dashuang Wang, Tuo Ping, Zhilan Du, Xiaoying Liu & Yuxin Zhang
Nano-Micro Lett. 17, 100 (2025). <https://doi.org/10.1007/s40820-024-01591-2>

3. Bioinspired Ultrasensitive Flexible Strain Sensors for Real-Time Wireless Detection of Liquid Leakage (Article)

Weilong Zhou, Yu Du, Yingying Chen, Congyuan Zhang, Xiaowei Ning, Heng Xie, Ting Wu, Jinlian Hu & Jinping Qu
Nano-Micro Lett. 17, 68 (2025). <https://doi.org/10.1007/s40820-024-01575-2>

4. Bioinspired Passive Tactile Sensors Enabled by Reversible Polarization of Conjugated Polymers (Article)

Feng He, Sitong Chen, Ruili Zhou, Hanyu Diao, Yangyang Han & Xiaodong Wu
Nano-Micro Lett. 17, 16 (2025). <https://doi.org/10.1007/s40820-024-01532-z>

5. A Skin-Inspired Self-Adaptive System for Temperature Control During Dynamic Wound Healing (Article)

Yaqi Geng, Guoyin Chen, Ran Cao, Hongmei Dai, Zexu Hu, Senlong Yu, Le Wang, Liping Zhu, Hengxue Xiang & Meifang Zhu
Nano-Micro Lett. 16, 152 (2024). <https://doi.org/10.1007/s40820-024-01345-0>

6. Recent Progress in Improving Rate Performance of Cellulose-Derived Carbon Materials for Sodium-Ion Batteries (Review)

Fujuan Wang, Tianyun Zhang, Tian Zhang, Tianqi He & Fen Ran
Nano-Micro Lett. 16, 148 (2024). <https://doi.org/10.1007/s40820-024-01351-2>

7. MXenes for Bioinspired Soft Actuators: Advancements in Angle-Independent Structural Colors and Beyond (Perspective)

Siavash Irvani & Rajender S. Varma
Nano-Micro Lett. 16, 142 (2024). <https://doi.org/10.1007/s40820-024-01367-8>

- 8. A Selective-Response Hypersensitive Bio-Inspired Strain Sensor Enabled by Hysteresis Effect and Parallel Through-Slits Structures (Article)**
Qun Wang, Zhongwen Yao, Changchao Zhang, Honglie Song, Hanliang Ding, Bo Li, Shichao Niu, Xinguan Huang, Chuanhai Chen, Zhiwu Han & Luquan Ren
Nano-Micro Lett. 16, 26 (2024). <https://doi.org/10.1007/s40820-023-01250-y>
- 9. Bioinspired All-Fibrous Directional Moisture-Wicking Electronic Skins for Biomechanical Energy Harvesting and All-Range Health Sensing (Article)**
Chuanwei Zhi, Shuo Shi, Shuai Zhang, Yifan Si, Jieqiong Yang, Shuo Meng, Bin Fei & Jinlian Hu
Nano-Micro Lett. 15, 60 (2023). <https://doi.org/10.1007/s40820-023-01028-2>
- 10. A Flexible Tribotronic Artificial Synapse with Bioinspired Neurosensory Behavior (Article)**
Jianhua Zeng, Junqing Zhao, Tianzhao Bu, Guoxu Liu, Youchao Qi, Han Zhou, Sicheng Dong & Chi Zhang
Nano-Micro Lett. 15, 18 (2023). <https://doi.org/10.1007/s40820-022-00989-0>
- 11. Bioinspired MXene-Based Soft Actuators Exhibiting Angle-Independent Structural Color (Article)**
Pan Xue, Yuanhao Chen, Yiyi Xu, Cristian Valenzuela, Xuan Zhang, Hari Krishna Bisoyi, Xiao Yang, Ling Wang, Xinhua Xu & Quan Li
Nano-Micro Lett. 15, 1 (2023). <https://doi.org/10.1007/s40820-022-00977-4>
- 12. Animal- and Human-Inspired Nanostructures as Supercapacitor Electrode Materials: A Review (Review)**
Iftikhar Hussain, Charmaine Lamiel, Sumanta Sahoo, Muhammad Sufyan Javed, Muhammad Ahmad, Xi Chen, Shuai Gu, Ning Qin, Mohammed A. Assiri & Kaili Zhang
Nano-Micro Lett. 14, 199 (2022). <https://doi.org/10.1007/s40820-022-00944-z>
- 13. Bioinspired Injectable Self-Healing Hydrogel Sealant with Fault-Tolerant and Repeated Thermo-Responsive Adhesion for Sutureless Post-Wound-Closure and Wound Healing (Article)**
Yuqing Liang, Huiru Xu, Zhenlong Li, Aodi Zhangji & Baolin Guo
Nano-Micro Lett. 14, 185 (2022). <https://doi.org/10.1007/s40820-022-00928-z>
- 14. Touch-Responsive Hydrogel for Biomimetic Flytrap-Like Soft Actuator (Article)**
Junjie Wei, Rui Li, Long Li, Wenqin Wang & Tao Chen
Nano-Micro Lett. 14, 182 (2022). <https://doi.org/10.1007/s40820-022-00931-4>
- 15. Self-Exfoliation of Flake Graphite for Bioinspired Compositing with Aramid Nanofiber toward Integration of Mechanical and Thermoconductive Properties (Article)**
Limei Huang, Guang Xiao, Yunjing Wang, Hao Li, Yahong Zhou, Lei Jiang & Jianfeng Wang
Nano-Micro Lett. 14, 168 (2022). <https://doi.org/10.1007/s40820-022-00919-0>
- 16. Bioinspired MXene-Based User-Interactive Electronic Skin for Digital and Visual Dual-Channel Sensing (Article)**
Wentao Cao, Zheng Wang, Xiaohao Liu, Zhi Zhou, Yue Zhang, Shisheng He, Daxiang Cui & Feng Chen
Nano-Micro Lett. 14, 119 (2022). <https://doi.org/10.1007/s40820-022-00838-0>

- 17. Bioinspired Adaptive, Elastic, and Conductive Graphene Structured Thin-Films Achieving High-Efficiency Underwater Detection and Vibration Perception (Article)**
Qiling Wang, Peng Xiao, Wei Zhou, Yun Liang, Guangqiang Yin, Qiu Yang, Shiao-Wei Kuo & Tao Chen
Nano-Micro Lett. 14, 62 (2022). <https://doi.org/10.1007/s40820-022-00799-4>
- 18. Bioinspired Nanostructured Superwetting Thin-Films in a Self-supported form Enabled “Miniature Umbrella” for Weather Monitoring and Water Rescue (Article)**
Shan Li, Peng Xiao, Wei Zhou, Yun Liang, Shiao-Wei Kuo & Tao Chen
Nano-Micro Lett. 14, 32 (2022). <https://doi.org/10.1007/s40820-021-00775-4>
- 19. Bio-Inspired Microwave Modulator for High-Temperature Electromagnetic Protection, Infrared Stealth and Operating Temperature Monitoring (Article)**
Xuan Yang, Yuping Duan, Shuqing Li, Huifang Pang, Lingxi Huang, Yuanyuan Fu & Tongmin Wang
Nano-Micro Lett. 14, 28 (2022). <https://doi.org/10.1007/s40820-021-00776-3>

Cellulose

- 1. Novel Cellulosic Fiber Composites with Integrated Multi-Band Electromagnetic Interference Shielding and Energy Storage Functionalities (Article)**
Xuewen Han, Cheng Hao, Yukang Peng, Han Yu, Tao Zhang, Haonan Zhang, Kaiwen Chen, Heyu Chen, Zhenxing Wang, Ning Yan & Junwen Pu
Nano-Micro Lett. 17, 122 (2025). <https://doi.org/10.1007/s40820-025-01652-0>
- 1. Cellulose Elementary Fibrils as Deagglomerated Binder for High-Mass-Loading Lithium Battery Electrodes (Article)**
Young-Kuk Hong, Jung-Hui Kim, Nag-Young Kim, Kyeong-Seok Oh, Hong-I Kim, Seokhyeon Ryu, Yumi Ko, Ji-Young Kim, Kwon-Hyung Lee & Sang-Young Lee
- 2. Smart Cellulose-Based Janus Fabrics with Switchable Liquid Transportation for Personal Moisture and Thermal Management (Article)**
Jianfeng Xi, Yanling Lou, Liucheng Meng, Chao Deng, Youlu Chu, Zhaoyang Xu, Huining Xiao & Weibing Wu
Nano-Micro Lett. 17, 14 (2025). <https://doi.org/10.1007/s40820-024-01510-5>
- 3. Hollow Metal–Organic Framework/MXene/Nanocellulose Composite Films for Giga/Terahertz Electromagnetic Shielding and Photothermal Conversion (Article)**
Tian Mai, Lei Chen, Pei-Lin Wang, Qi Liu & Ming-Guo Ma
Nano-Micro Lett. 16, 169 (2024). <https://doi.org/10.1007/s40820-024-01386-5>
- 4. Rational Design of Cellulosic Triboelectric Materials for Self-Powered Wearable Electronics (Review)**
Xiangjiang Meng, Chenchen Cai, Bin Luo, Tao Liu, Yuzheng Shao, Shuangfei Wang & Shuangxi Nie

- Nano-Micro Lett. 15, 124 (2023). <https://doi.org/10.1007/s40820-023-01094-6>
5. **Nanocellulose-Assisted Construction of Multifunctional MXene-Based Aerogels with Engineering Biomimetic Texture for Pressure Sensor and Compressible Electrode (Article)**
Ting Xu, Qun Song, Kun Liu, Huayu Liu, Junjie Pan, Wei Liu, Lin Dai, Meng Zhang, Yaxuan Wang, Chuanling Si, Haishun Du & Kai Zhang
Nano-Micro Lett. 15, 98 (2023). <https://doi.org/10.1007/s40820-023-01073-x>
6. **Vertically Aligned Silicon Carbide Nanowires/Boron Nitride Cellulose Aerogel Networks Enhanced Thermal Conductivity and Electromagnetic Absorbing of Epoxy Composites (Article)**
Duo Pan, Gui Yang, Hala M. Abo-Dief, Jingwen Dong, Fengmei Su, Chuntai Liu, Yifan Li, Ben Bin Xu, Vignesh Murugadoss, Nithesh Naik, Salah M. El-Bahy, Zeinhom M. El-Bahy, Minan Huang & Zhanhu Guo
Nano-Micro Lett. 14, 118 (2022). <https://doi.org/10.1007/s40820-022-00863-z>
7. **Biodegradable, Super-Strong, and Conductive Cellulose Macrofibers for Fabric-Based Triboelectric Nanogenerator (Article)**
Sanming Hu, Jing Han, Zhijun Shi, Kun Chen, Nuo Xu, Yifei Wang, Ruizhu Zheng, Yongzhen Tao, Qijun Sun, Zhong Lin Wang & Guang Yang
Nanogenerator. Nano-Micro Lett. 14, 115 (2022). <https://doi.org/10.1007/s40820-022-00858-w>
8. **Cellulose Nanopaper: Fabrication, Functionalization, and Applications (Review)**
Wei Liu, Kun Liu, Haishun Du, Ting Zheng, Ning Zhang, Ting Xu, Bo Pang, Xinyu Zhang, Chuanling Si & Kai Zhang
Nano-Micro Lett. 14, 104 (2022). <https://doi.org/10.1007/s40820-022-00849-x>
9. **Functionalized Fiber-Based Strain Sensors: Pathway to Next-Generation Wearable Electronics (Review)**
Zekun Liu, Tianxue Zhu, Junru Wang, Zijian Zheng, Yi Li, Jiashen Li & Yuekun Lai
Nano-Micro Lett. 14, 61 (2022). <https://doi.org/10.1007/s40820-022-00806-8>

Biomass

1. **Enhancing the Electrocatalytic Oxidation of 5-Hydroxymethylfurfural Through Cascade Structure Tuning for Highly Stable Biomass Upgrading (Article)**
Xiaoli Jiang, Xianhui Ma, Yuanteng Yang, Yang Liu, Yanxia Liu, Lin Zhao, Penglei Wang, Yagang Zhang, Yue Lin & Yen Wei
Nano-Micro Lett. 16, 275 (2024). <https://doi.org/10.1007/s40820-024-01493-3>
2. **Green, Sustainable Architectural Bamboo with High Light Transmission and Excellent Electromagnetic Shielding as a Candidate for Energy-Saving Buildings (Article)**
Jing Wang, Xinyu Wu, Yajing Wang, Weiyang Zhao, Yue Zhao, Ming Zhou, Yan Wu & Guangbin Ji

Nano-Micro Lett. 15, 11 (2023). <https://doi.org/10.1007/s40820-022-00982-7>

3. Biomass-Derived Carbon Heterostructures Enable Environmentally Adaptive Wideband Electromagnetic Wave Absorbers (Article)

Zhichao Lou, Qiuyi Wang, Ufuoma I. Kara, Rajdeep S. Mamtani, Xiaodi Zhou, Huiyang Bian, Zhihong Yang, Yanjun Li, Hualiang Lv, Solomon Adera & Xiaoguang Wang

Nano-Micro Lett. 14, 11 (2022). <https://doi.org/10.1007/s40820-021-00750-z>

4. Biomass Microcapsules with Stem Cell Encapsulation for Bone Repair (Article)

Lei Yang, Yuxiao Liu, Lingyu Sun, Cheng Zhao, Guopu Chen & Yuanjin Zhao

Nano-Micro Lett. 14, 4 (2022). <https://doi.org/10.1007/s40820-021-00747-8>

Fibrous materials

2. Novel Cellulosic Fiber Composites with Integrated Multi-Band Electromagnetic Interference Shielding and Energy Storage Functionalities (Article)

Xuewen Han, Cheng Hao, Yukang Peng, Han Yu, Tao Zhang, Haonan Zhang, Kaiwen Chen, Heyu Chen, Zhenxing Wang, Ning Yan & Junwen Pu

Nano-Micro Lett. 17, 122 (2025). <https://doi.org/10.1007/s40820-025-01652-0>

3. Recent Advances in Fibrous Materials for Hydroelectricity Generation (Review)

Can Ge, Duo Xu, Xiao Feng, Xing Yang, Zheheng Song, Yuhang Song, Jingyu Chen, Yingcun Liu, Chong Gao, Yong Du, Zhe Sun, Weilin Xu & Jian Fang

Nano-Micro Lett. 17, 29 (2025). <https://doi.org/10.1007/s40820-024-01537-8>

4. Multiple Tin Compounds Modified Carbon Fibers to Construct Heterogeneous Interfaces for Corrosion Prevention and Electromagnetic Wave Absorption (Article)

Zhiqiang Guo, Di Lan, Zirui Jia, Zhenguo Gao, Xuetao Shi, Mukun He, Hua Guo, Guanglei Wu & Pengfei Yin

Nano-Micro Lett. 17, 23 (2025). <https://doi.org/10.1007/s40820-024-01527-w>

5. “Zero-Strain” NiNb₂O₆ Fibers for All-Climate Lithium Storage (Article)

Yan Zhao, Qiang Yuan, Liting Yang, Guisheng Liang, Yifeng Cheng, Limin Wu, Chunfu Lin & Renchao Che

Nano-Micro Lett. 17, 15 (2025). <https://doi.org/10.1007/s40820-024-01497-z>

6. Multifunctional Film Assembled from N-Doped Carbon Nanofiber with Co–N₄–O Single Atoms for Highly Efficient Electromagnetic Energy Attenuation (Article)

Jia Xu, Bei Li, Zheng Ma, Xiao Zhang, Chunling Zhu, Feng Yan, Piaoping Yang & Yujin Chen

Nano-Micro Lett. 16, 240 (2024). <https://doi.org/10.1007/s40820-024-01440-2>

7. Controlled Twill Surface Structure Endowing Nanofiber Composite Membrane Excellent Electromagnetic Interference Shielding (Article)

Dechang Tao, Xin Wen, Chenguang Yang, Kun Yan, Zhiyao Li, Wenwen Wang & Dong Wang

- Nano-Micro Lett. 16, 236 (2024). <https://doi.org/10.1007/s40820-024-01444-y>
8. **Polymer Fiber Rigid Network with High Glass Transition Temperature Reinforces Stability of Organic Photovoltaics (Article)**
Qiao Zhou, Cenqi Yan, Hongxiang Li, Zhendong Zhu, Yujie Gao, Jie Xiong, Hua Tang, Can Zhu, Hailin Yu, Sandra P. Gonzalez Lopez, Jiayu Wang, Meng Qin, Jianshu Li, Longbo Luo, Xiangyang Liu, Jiaqiang Qin, Shirong Lu, Lei Meng, Frédéric Laquai, Yongfang Li & Pei Cheng
Nano-Micro Lett. 16, 224 (2024). <https://doi.org/10.1007/s40820-024-01442-0>
9. **MXene@c-MWCNT Adhesive Silica Nanofiber Membranes Enhancing Electromagnetic Interference Shielding and Thermal Insulation Performance in Extreme Environments (Article)**
Ziyuan Han, Yutao Niu, Xuetao Shi, Duo Pan, Hu Liu, Hua Qiu, Weihua Chen, Ben Bin Xu, Zeinhom M. El-Bahy, Hua Hou, Eman Ramadan Elsharkawy, Mohammed A. Amin, Chuntai Liu & Zhanhu Guo
Nano-Micro Lett. 16, 195 (2024). <https://doi.org/10.1007/s40820-024-01398-1>
10. **Functional Optical Fiber Sensors Detecting Imperceptible Physical/Chemical Changes for Smart Batteries (Review)**
Yiding Li, Li Wang, Youzhi Song, Wenwei Wang, Cheng Lin & Xiangming He
Nano-Micro Lett. 16, 154 (2024). <https://doi.org/10.1007/s40820-024-01374-9>
11. **Novel Perovskite Oxide Hybrid Nanofibers Embedded with Nanocatalysts for Highly Efficient and Durable Electrodes in Direct CO₂ Electrolysis (Article)**
Akromjon Akhmadjonov, Kyung Taek Bae & Kang Taek Lee
Nano-Micro Lett. 16, 93 (2024). <https://doi.org/10.1007/s40820-023-01298-w>
12. **Efficient Polytelluride Anchoring for Ultralong-Life Potassium Storage: Combined Physical Barrier and Chemisorption in Nanogrid-in-Nanofiber (Article)**
Qinghua Li, Dandan Yu, Jian Peng, Wei Zhang, Jianlian Huang, Zhixin Liang, Junling Wang, Zeyu Lin, Shiyun Xiong, Jiazhao Wang & Shaoming Huang
Nano-Micro Lett. 16, 77 (2024). <https://doi.org/10.1007/s40820-023-01318-9>
13. **Highly Aligned Ternary Nanofiber Matrices Loaded with MXene Expedite Regeneration of Volumetric Muscle Loss (Article)**
Moon Sung Kang, Yeuni Yu, Rowoon Park, Hye Jin Heo, Seok Hyun Lee, Suck Won Hong, Yun Hak Kim & Dong-Wook Han
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14. **Diphyllaia Grayi-Inspired Intelligent Temperature-Responsive Transparent Nanofiber Membranes (Article)**
Cengceng Zhao, Gaohui Liu, Yanyan Lin, Xueqin Li, Na Meng, Xianfeng Wang, Shaoju Fu, Jianyong Yu & Bin Ding
Nano-Micro Lett. 16, 65 (2024). <https://doi.org/10.1007/s40820-023-01279-z>
15. **Coaxial Wet Spinning of Boron Nitride Nanosheet-Based Composite Fibers with Enhanced Thermal Conductivity and Mechanical Strength (Article)**
Wenjiang Lu, Qixuan Deng, Minsu Liu, Baofu Ding, Zhiyuan Xiong & Ling Qiu

- Nano-Micro Lett. 16, 25 (2024). <https://doi.org/10.1007/s40820-023-01236-w>
- 16. Core–Shell Microfiber Encapsulation Enables Glycerol-Free Cryopreservation of RBCs with High Hematocrit (Article)**
Xianhui Qin, Zhongrong Chen, Lingxiao Shen, Huilan Liu, Xilin Ouyang & Gang Zhao
Nano-Micro Lett. 16, 3 (2024). <https://doi.org/10.1007/s40820-023-01213-3>
- 17. Temperature-Arousing Self-Powered Fire Warning E-Textile Based on p–n Segment Coaxial Aerogel Fibers for Active Fire Protection in Firefighting Clothing (Article)**
Hualing He, Yi Qin, Zhenyu Zhu, Qing Jiang, Shengnan Ouyang, Yuhang Wan, Xueru Qu, Jie Xu & Zhicai Yu
Nano-Micro Lett. 15, 226 (2023). <https://doi.org/10.1007/s40820-023-01200-8>
- 18. "Three-in-One" Multi-Scale Structural Design of Carbon Fiber-Based Composites for Personal Electromagnetic Protection and Thermal Management (Article)**
Ming Zhou, Shujuan Tan, Jingwen Wang, Yue Wu, Leilei Liang & Guangbin Ji
Nano-Micro Lett. 15, 176 (2023). <https://doi.org/10.1007/s40820-023-01144-z>
- 19. Nanofiber Composite Reinforced Organohydrogels for Multifunctional and Wearable Electronics (Article)**
Jing Wen, Yongchuan Wu, Yuxin Gao, Qin Su, Yuntao Liu, Haidi Wu, Hechuan Zhang, Zhanqi Liu, Hang Yao, Xuewu Huang, Longcheng Tang, Yongqian Shi, Pingan Song, Huaiguo Xue & Jiefeng Gao
Nano-Micro Lett. 15, 174 (2023). <https://doi.org/10.1007/s40820-023-01148-9>
- 20. Tetris-Style Stacking Process to Tailor the Orientation of Carbon Fiber Scaffolds for Efficient Heat Dissipation (Article)**
Shida Han, Yuan Ji, Qi Zhang, Hong Wu, Shaoyun Guo, Jianhui Qiu & Fengshun Zhang
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- 21. Biological Tissue-Inspired Ultrasoft, Ultrathin, and Mechanically Enhanced Microfiber Composite Hydrogel for Flexible Bioelectronics (Article)**
Qiang Gao, Fuqin Sun, Yue Li, Lianhui Li, Mengyuan Liu, Shuqi Wang, Yongfeng Wang, Tie Li, Lin Liu, Simin Feng, Xiaowei Wang, Seema Agarwal & Ting Zhang
Nano-Micro Lett. 15, 139 (2023). <https://doi.org/10.1007/s40820-023-01096-4>
- 22. Highly Ordered Thermoplastic Polyurethane/Aramid Nanofiber Conductive Foams Modulated by Kevlar Polyanion for Piezoresistive Sensing and Electromagnetic Interference Shielding (Original Article)**
Kunpeng Qian, Jianyu Zhou, Miao Miao, Hongmin Wu, Sineenat Thaiboonrod, Jianhui Fang & Xin Feng
Nano-Micro Lett. 15, 88 (2023). <https://doi.org/10.1007/s40820-023-01062-0>
- 23. Recent Advances and Challenges Toward Application of Fibers and Textiles in Integrated Photovoltaic Energy Storage Devices (Review)**
Amjid Rafique, Isabel Ferreira, Ghulam Abbas & Ana Catarina Baptista
Nano-Micro Lett. 15, 40 (2023). <https://doi.org/10.1007/s40820-022-01008-y>

24. Multicomponent Nanoparticles Synergistic One-Dimensional Nanofibers as Heterostructure Absorbers for Tunable and Efficient Microwave Absorption (Article)

Chenxi Wang, Yue Liu, Zirui Jia, Wanru Zhao & Guanglei Wu

Nano-Micro Lett. 15, 13 (2023). <https://doi.org/10.1007/s40820-022-00986-3>