

Selected Patents by Prof. Huining Xiao (2018–2024) Environment, Agriculture, and Animal Health Applications

Under the leadership of Prof. Huining Xiao (R&D Director, Canadian Academy of Engineering), the Center has secured multiple patents demonstrating the practical application of nano-materials in “One Health” contexts, including environmental remediation, sustainable agriculture, and antimicrobial innovations:

Selected recent patents (2018–2024):

1. A metal catalyst for ethylene control strategies and its preparation method and application (ZL202110500412.1, granted 2023) – Agriculture (fruit preservation).
2. A method for producing natural protein/polysaccharide composite nanoparticles using *Lactobacillus plantarum* (ZL202210591744.X, granted 2023) – Animal health (drug delivery).
3. A paper-based film and its preparation method and application (ZL202210494276.4, granted 2023) – Environmental (biodegradable materials).
4. A synthesis method and application of capsular polysaccharide and antibiotic nanoparticles (ZL202210686294.2, under review) – Antimicrobial (animal/human health).
5. A preparation method for conductive ternary composite materials and its application (ZL202010376158.4, granted 2022) – Agriculture/environmental sensors.
6. A biodegradable antimicrobial and antiviral mask and its preparation method (ZL202110534082.8, granted 2022) – Animal/human health (infection control).
7. A preparation method for a soil stabilizer (ZL201811028518.0, granted 2020) – Environmental (heavy metal remediation).
8. A heavy metal adsorbent and its preparation method and application (ZL201810479233.2, granted 2020) – Environmental (mercury removal from water/soil).

Full list available upon request. These patents strengthen the Center’s contributions to environmental protection, sustainable agriculture, and animal health — core pillars of the Platform’s “One Health” approach.

Selected Publications by Prof. Huining Xiao (2018–2025) Environment, Agriculture, and Animal Health Applications

Under the leadership of Prof. Huining Xiao (R&D Director), the Center has published numerous high-impact papers demonstrating the practical application of cellulose-based and nano-materials in “One Health” contexts:

Selected recent publications (2018–2025):

1. M Li et al., S-CDs encapsulated polyamide fluorescent membranes for mercury (II) ions detection in aqueous environments, *Separation and Purification Technology* 359, 130876 (2025)
2. Y Zhong et al., Catechol-grafted chitosan-based antioxidant hydrogel for wound healing, *International Journal of Biological Macromolecules* 288, 138509 (2025)
3. X Shi et al., Active biodegradable bacterial cellulose films to minimize plastic pollution, *Food Chemistry* 464, 141852 (2025)
4. Y Lou et al., High-permeance nanocellulose/ZnO hybrid membranes for wastewater purification, *Carbohydrate Polymers* 348, 122807 (2025)
5. Z Yan et al., Bifunctional Nanocellulose@MOF composite aerogel for tetracycline removal, *Carbohydrate Polymers* 347, 122697 (2025)
6. C Deng et al., High-Barrier, Photothermal Conversion, and Antibacterial Composite for Plastic Replacement, *ACS Sustainable Chemistry & Engineering* 12(51), 18350-18361 (2024)
7. Y Li et al., Dual-functional lignocellulosic mulch as agricultural plastic alternative, *International Journal of Biological Macromolecules* 132945 (2024)
8. H Wei et al., Platinum-loaded dendritic mesoporous silica as ethylene scavenger for banana preservation, *Food Chemistry* 424, 136415 (2023)
9. C Liu et al., Advances in green materials derived from wood for detecting and removing mercury ions, *Environmental Pollution* 335, 122351 (2023)
10. Y Pan et al., Controlled Release of Agrochemicals Using pH and Redox Dual Responsive Cellulose Nanogels, *Journal of Agricultural and Food Chemistry* 67(24), 6700-6707 (2019)

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