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### **Biomimetic molecular recognition platforms applied in Environmental and Biomedical Sciences**

**Abstract:** This oral presentation showcases the latest research outcomes of our group focusing on the rational design, development, and practical application of molecularly imprinted polymers (MIPs) across diverse fields of applied sciences. Molecular imprinting technique enables the fast, versatile, robust, and cost-effective synthesis of biomimetic polymeric receptors with tailor-made selectivity towards a broad spectrum of target molecules. MIPs, serving as artificial receptors, exhibit quite unique and attractive features such as selectivity comparable to that of affinity biomacromolecules and a remarkable stability under various experimental conditions.

Our investigations delve into the integration of MIPs in a wide range of separation techniques such as High-Performance Liquid Chromatography (HPLC), Capillary Electrochromatography (CEC), and Solid Phase Extraction (SPE), as well as their role as biomimetic affinity components in the development of electrochemical sensors. These techniques have been applied effectively in pharmaceutical, biomedical, and environmental sample analysis.

Furthermore, we explored their application as drug delivery systems (DDS), showcasing their ability to offer sustained/controlled release of therapeutic agents.