

## **Molecularly Imprinting: Promises And Challenges**

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### **ABSTRACT**

Molecular recognition displayed by naturally occurring receptors has continued to inspire innovations aimed at developing systems that can mimic this natural phenomenon. Since 1930s, a technology called molecular imprinting for producing biomimetic receptors was introduced. In this technology, binding sites are introduced in a polymer matrix by polymerizing functional monomers and cross-linking monomers in the presence of a target analyte.<sup>1</sup> Subsequent removal of the analyte, leaves behind binding sites or cavities specific to the analyte. The ultimate goal of molecular imprinting has been to produce materials providing comparable binding properties as natural receptors. Although this may not be achieved in every templating scenario, recognition performance comparable to natural analogues has been demonstrated, e.g., by Vlatkis *et al.*,<sup>2</sup> whereby assays based on molecularly imprinted polymers (MIPs) achieved results comparable to enzyme based assays. MIPs have also been applied for smart drug release,<sup>3</sup> sorbents in separation science,<sup>4</sup> and recognition elements in sensors,<sup>5,6</sup> This paper looks at various achievements in molecular imprinting, the promises, challenges and proposes ways of addressing these challenges.

**Keywords:** Molecular imprinting, Molecularly imprinted polymers, Functional monomers, Cross-linking monomers.

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