

**Design of synthetic receptors for monitoring of AMP-based**

**Stimulants**

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The thread of synthetic drugs is one of the most significant current drug problems worldwide. Amphetamine Type Stimulants (ATS) are globally second most widely used drugs after cannabis, exceeding the use of cocaine and heroin. ATS are potent central nervous system (CNS) stimulants, capable of inducing euphoric static similar to cocaine. Recreational use of ATS is widespread, even though warnings of irreversible damage of the CNS were reported. ATS are a big problem and their production contributes to the pollution of the environment, so there is a demand to develop robust and sensitive sensors that can detect amphetamine type stimulants and their metabolites in environmental water samples. Analysis of waste water, which sometimes can be harsh environment using antibodies based test cannot be applicable. Therefore molecular imprinted polymers (MIPs), which are known as synthetic antibodies, have been chosen for that approach. MIPs are characterized with a high mechanical and thermal stability, show chemical resistance in a broad pH range and various organic or aqueous solvents. These properties make them the preferred type of receptors for application in the harsh conditions imposed by environmental samples.To the best of our knowledge there are no existing MIPs-based sensors toward AMP. Also not many commercial MIPs against AMP are available. Therefore, the aim of this study was to compare different techniques to obtain MIPs with high specificity towards ATS and characterize them for following use in the sensor. MIPs against ATS were synthesized using electro polymerization and UV-initiated polymerization. Subsequently comparison with commercially available MIPs against amphetamine was performed in point of specificity and selectivity. Different linkers and immobilization techniques were examined, which allowed to choose an optimal method. Stability of MIPs in extreme conditions, such as highly acidic or basic was determined. Obtained results gave conclusion about MIP based sensor applicability in sewage system testing.

**Acknowledgment**

This project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 653626. CapSenze Biosystems is highly acknowledged for their help and support in this work.