

New Au-based nano/microstructures for the development of a new aptasensor for oxytetracycline

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INTRODUCTION

• Oxytetracycline (OXT) is an important with widespread use antibiotic. Its overuse fuels the rise of the problem of antibiotic resistance. In this context, there is a clear need for the development of new, fast and sensitive analytical methods capable of performing in field analysis, like electrochemical aptasensors [1].

• The aim of our work was the development of an aptasensor for OXT, using as a starting platform carbon-based screen printed electrodes (C-SPE), modified with Au-based nano/microstructures (Au-NSs/Au- μ Ss).

• Au-NSs/Au- μ Ss|C-SPE:

- lower cost compared to Au-based SPE (Au-SPE)
- test the influence of the architecture of the Au-NSs/Au- μ Ss

• Thiolated DNA aptamer (APT), ferrocene-labelled (Fc) \rightarrow HS-APT-Fc

Fc-GGA-ATT-CGC-TAG-CAC-GTT-GAC-GCT-GGT-GCC-CGG-TTG-TGG-TGC-GAG-TGT-TGT-GTG-GAT-CCG-AGC-TCC-ACG-TG-(CH₂)₆-SH

Protocols for the electrodeposition of Au-NSs/Au- μ Ss

Platform	C _M HAuCl ₄ (mM)	Electrolyte	Electrochemical technique	Parameters
P1	10	0.1 M KCl	CA	-0.3 V, 1200 s
P2	10	0.5 M H ₂ SO ₄	CP	-100 μ A, 600 s
P3	5	0.5 M H ₂ SO ₄	CA	-0.4V, 1200 s

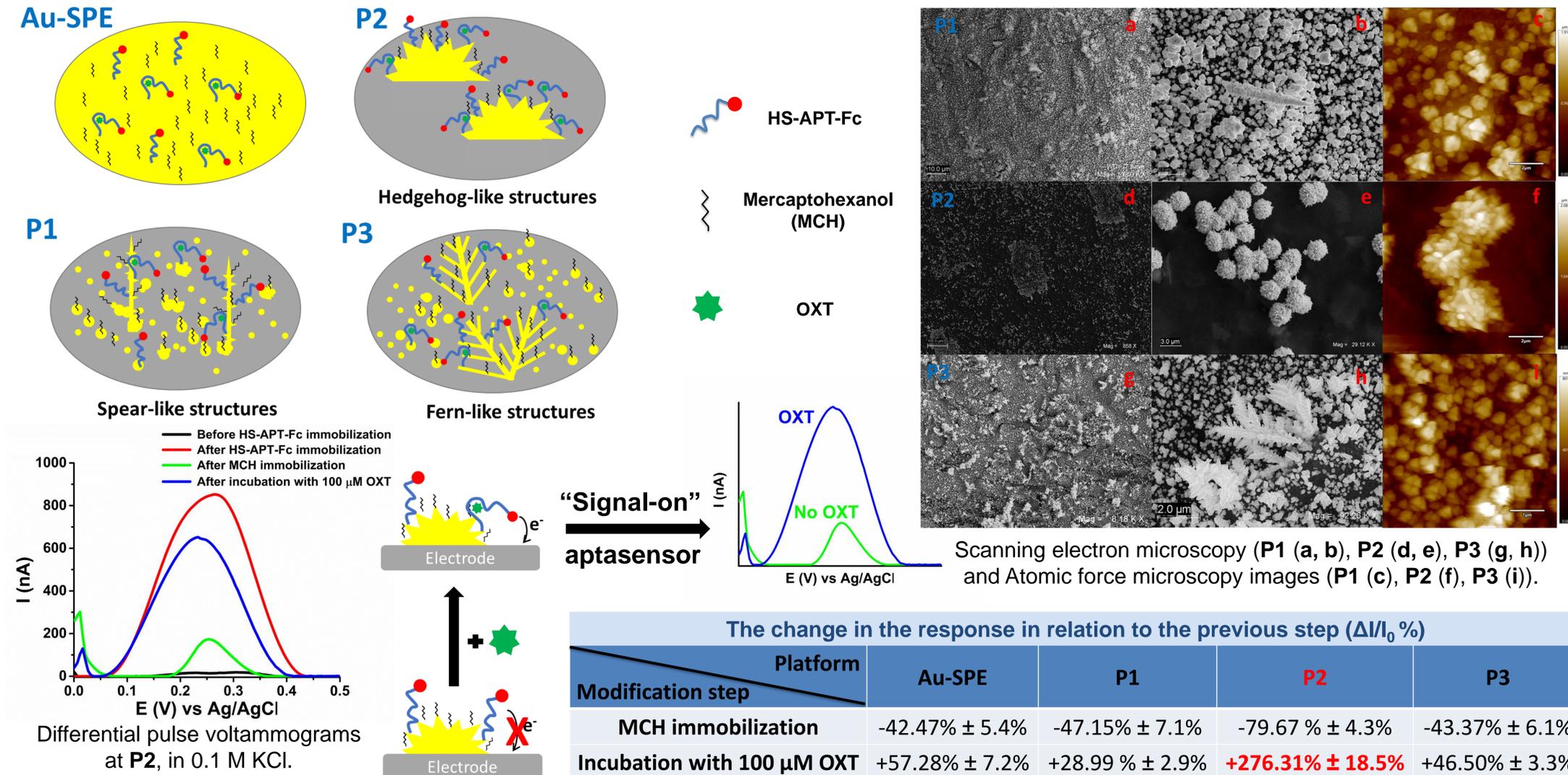
CA: Chronoamperometry; CP: Chronopotentiometry;

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1. Y. Li *et al.*, *Sensors Actuators, B Chem.*, 240 (2017) 785–792, DOI:10.1016/j.snb.2016.09.042.

Au-NSs/Au- μ Ss|C-SPE – Aptasensor characterization



CONCLUSIONS

- The creation and characterization of new Au-NSs/Au- μ Ss|C-SPE for an aptasensor for OXT was carried out;
- The resulting analytical platforms were selected based on their influence on the immobilization of the aptamer and on the response of the aptasensor to the binding of OXT;
- A more well-organized architecture, with much more uniform NSs favored a better response of the "signal-on" aptasensor.