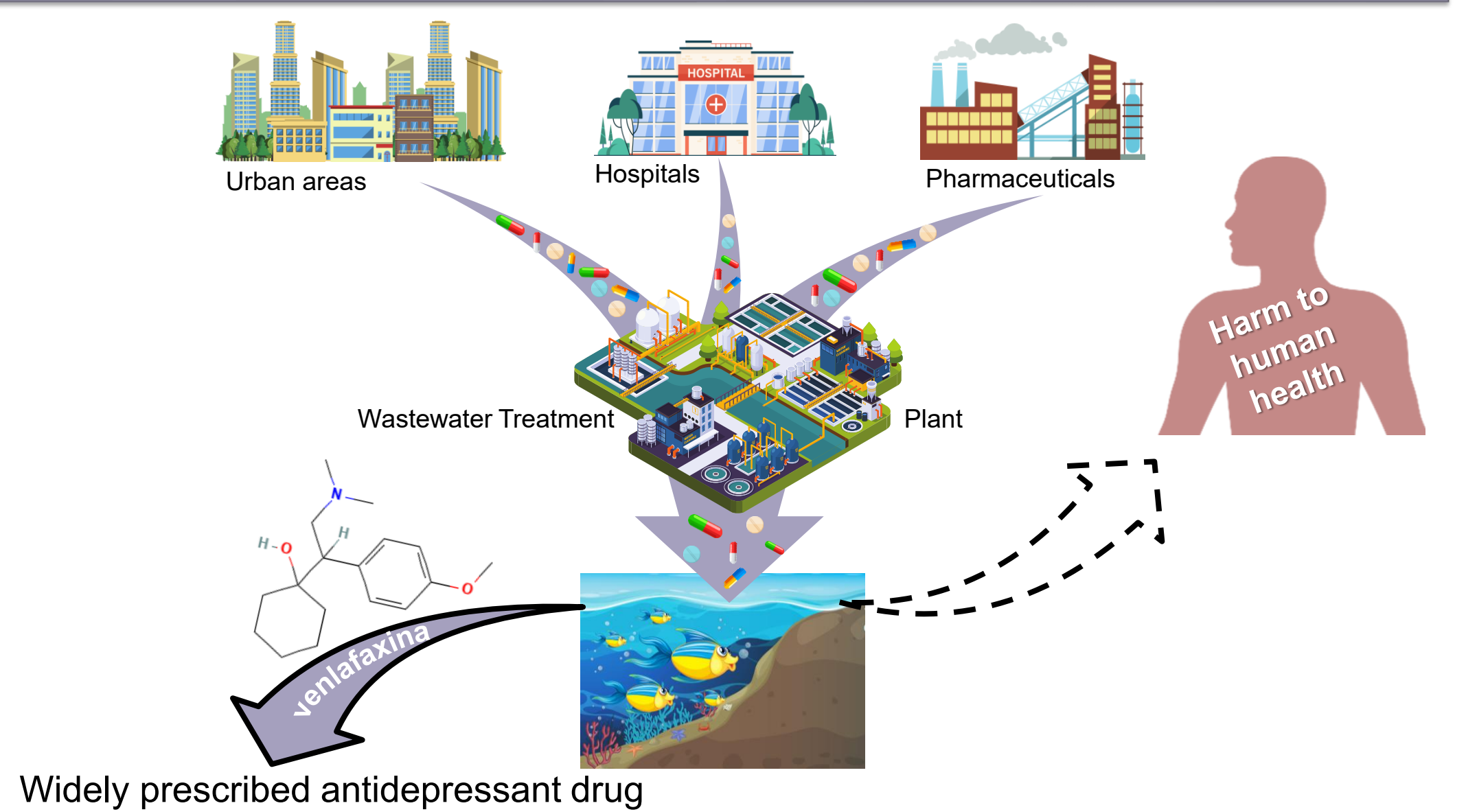


Carbon-Paper Transducer for Detection of Venlafaxine

Petra Albuquerque*, Miguel Tavares, Vitória Dibo, Cristina Delerue-Matos, Simone Morais**, Álvaro Torrinha
REQUIMTE/LAQV, ISEP, Polytechnic of Porto, Rua Dr. António Bernardino de Almeida, 431, 4249-015, Porto, Portugal

*petraalbuquerque@hotmail.com **sbm@isep.ipp.pt

INTRODUCTION & AIM



Electrochemical sensor

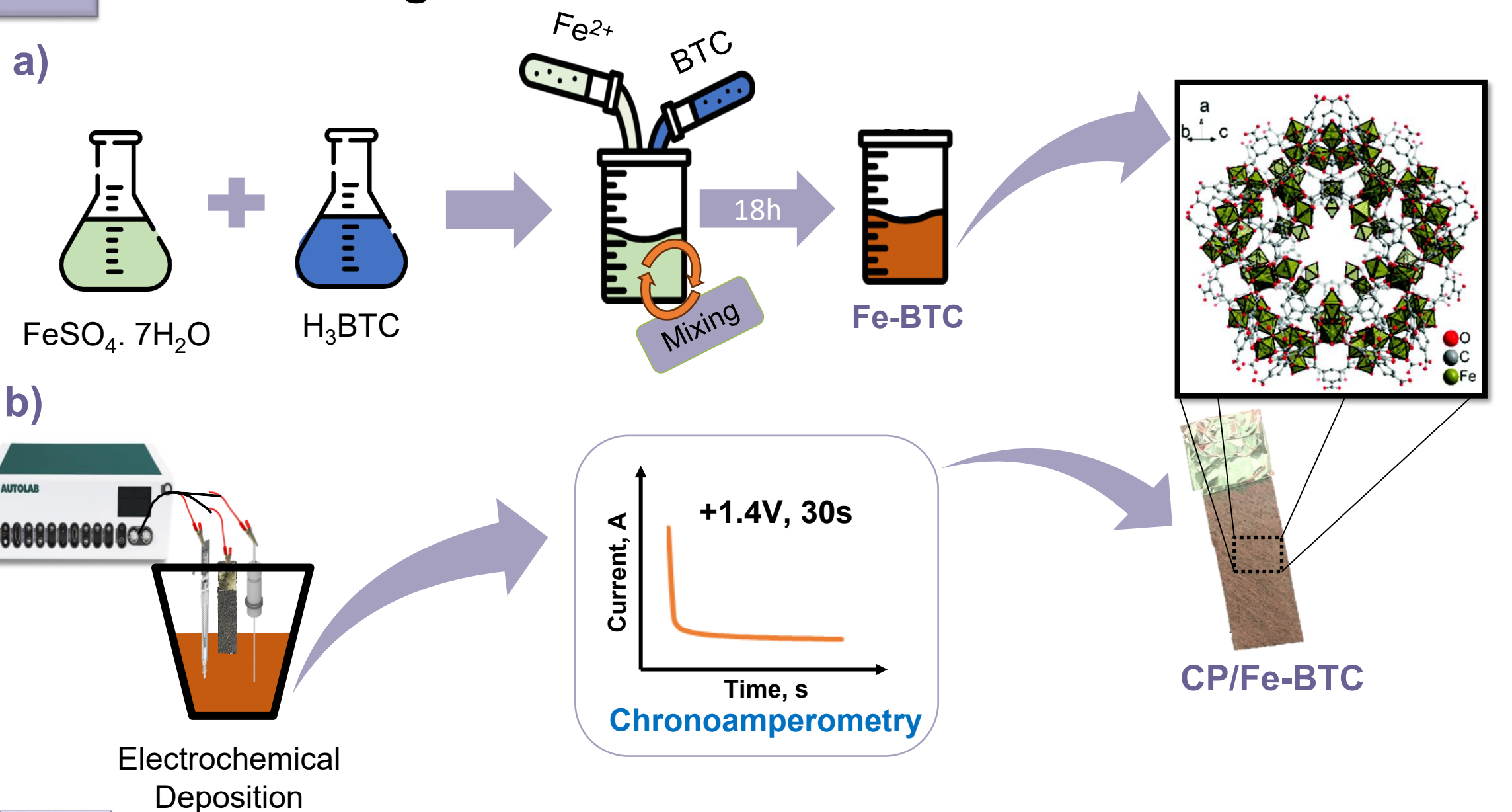
Carbon Paper (CP) Miniaturization Low-Cost materials High surface/volume ratio

MOF (Fe-BTC) Large surface area Easy synthesis Electrochemical Properties

AIM: Develop a simple and effective modified carbon-based sensor for detection of venlafaxine

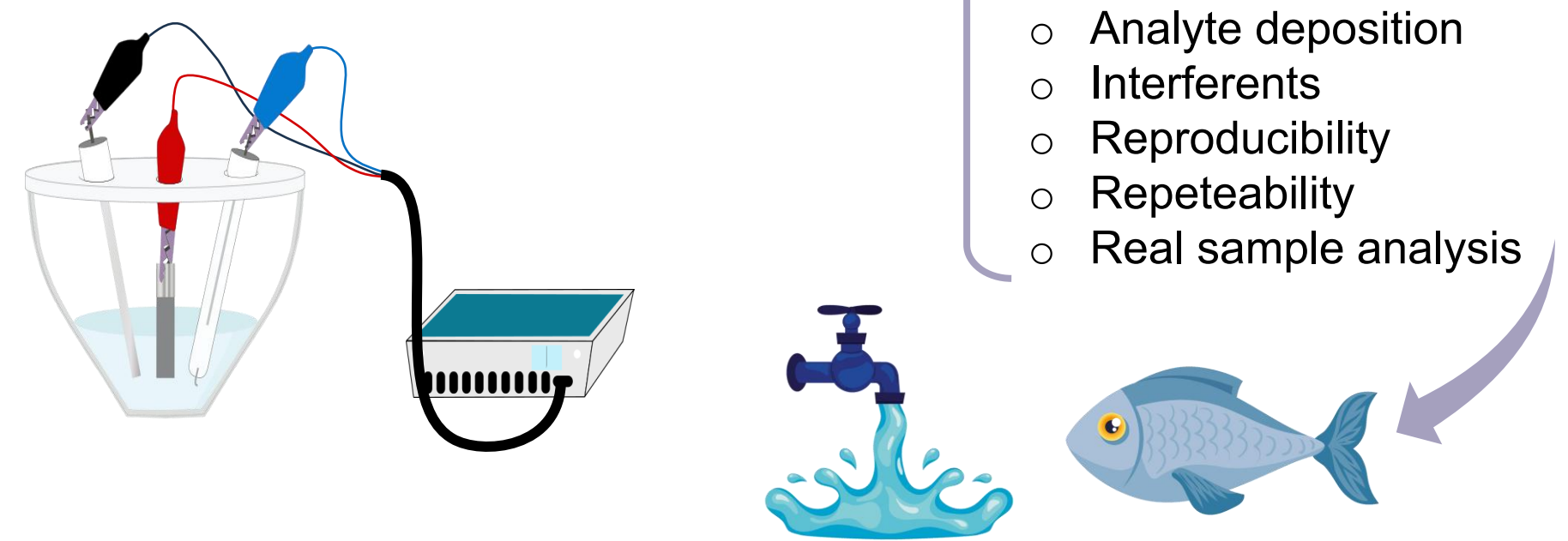
METHOD

1 Sensor design and fabrication



2 Sensor optimization & Application

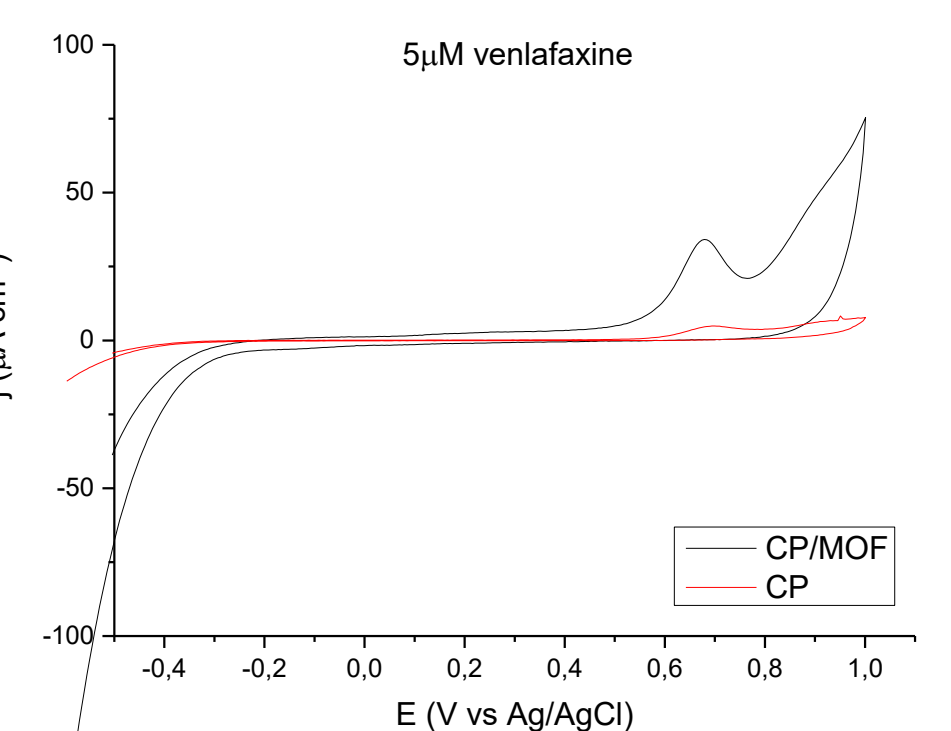
- Cyclic Voltammetry (CV)
- Square Wave Voltammetry (SWV)



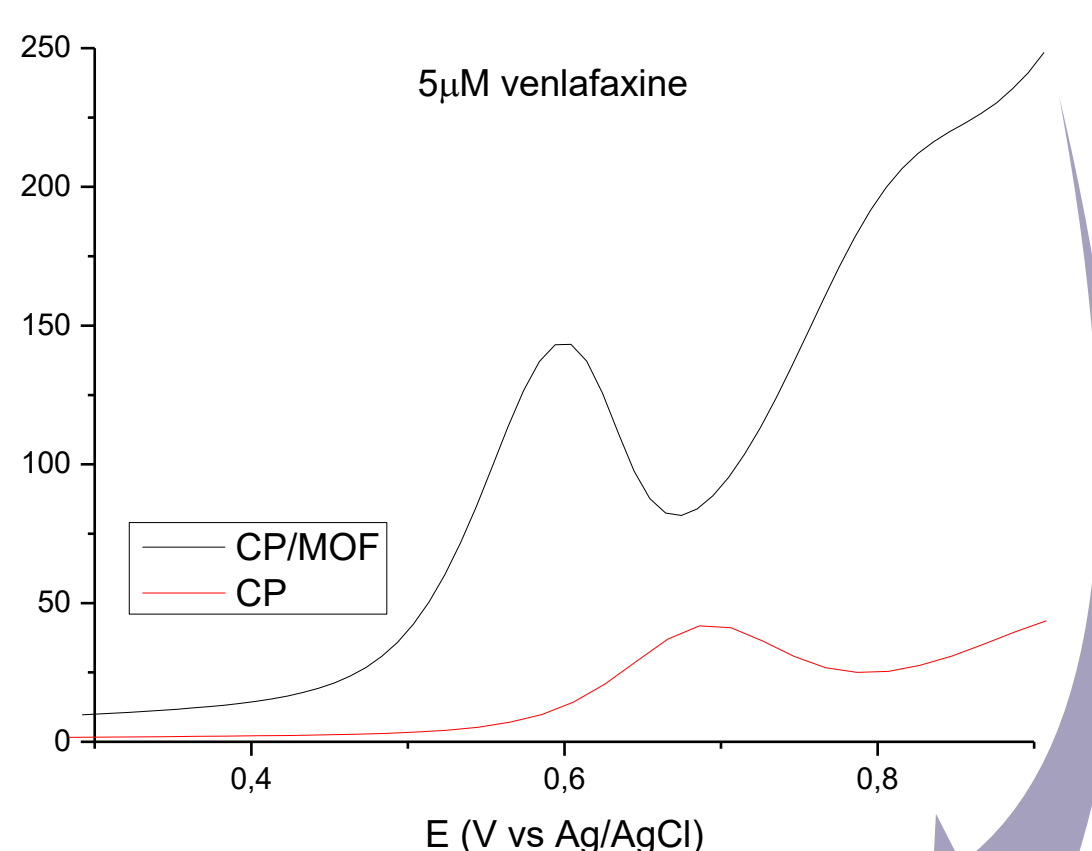
- Electrolyte pH
- Frequency
- Step potential
- Amplitude
- Analyte deposition
- Interferents
- Reproducibility
- Repeatability
- Real sample analysis

RESULTS & DISCUSSION

CV comparison of CP vs CP/MOF

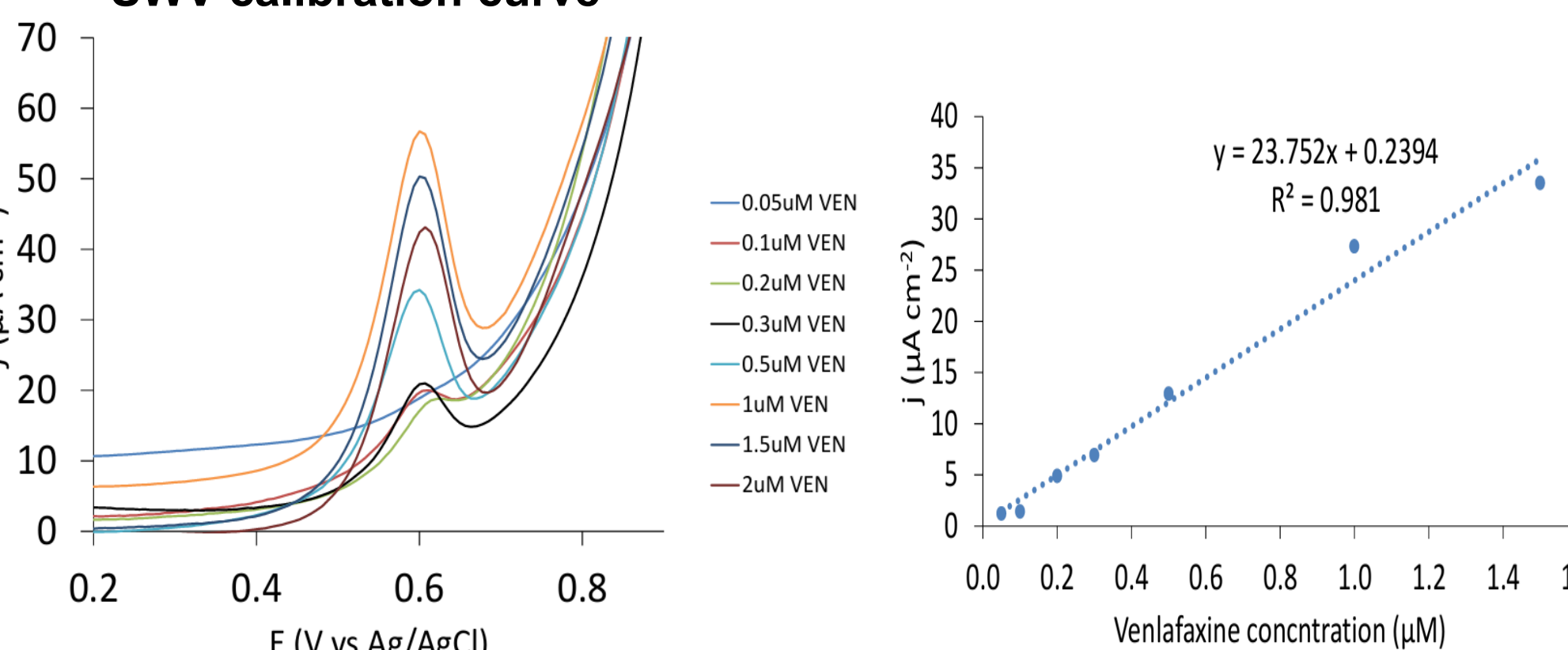


SWV comparison of CP vs CP/MOF (after optimizations)

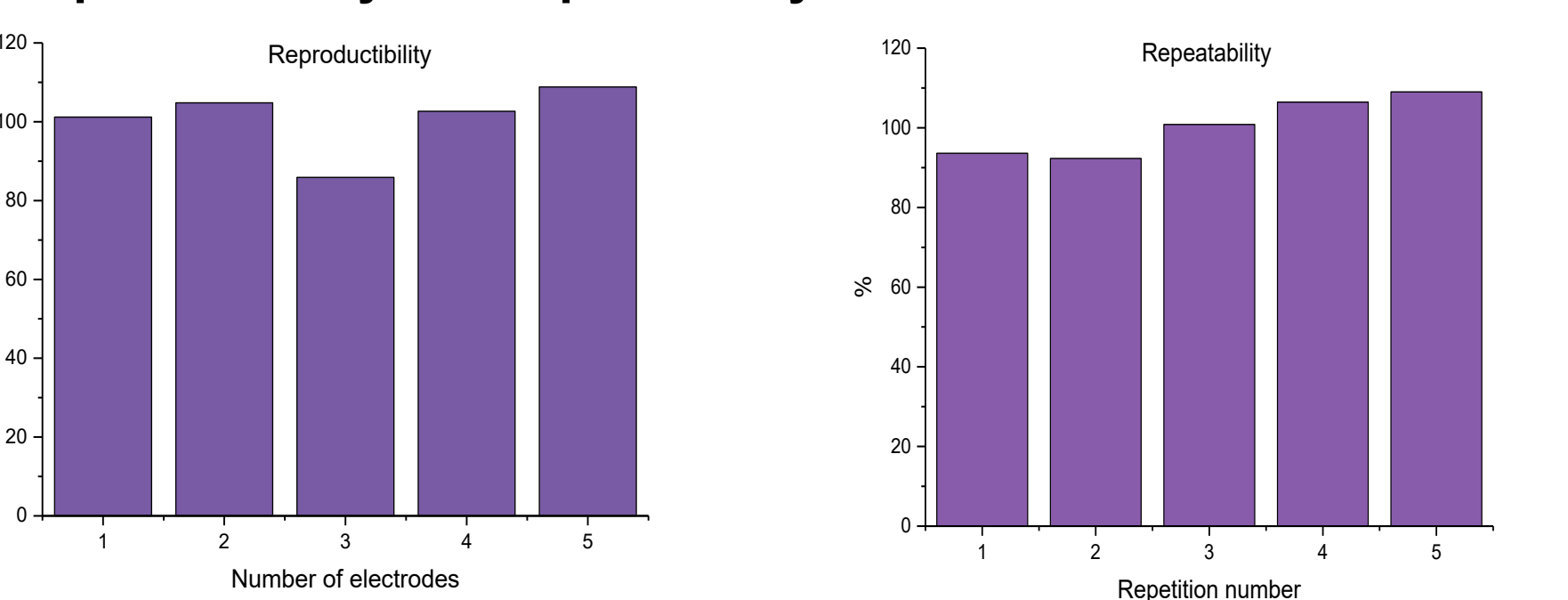


- pH = 10
- f = 10 Hz
- step P = 0.01 V
- A = 0.1 V
- no deposition

SWV calibration curve



Reproducibility and repeatability



Real sample analysis

	Conc. Added (μM)	Average Recovery (%)	RSD (%)
fish	1.50	94.5	14.0
	0.50	84.0	5.0
water	1.50	95.1	7.1
	0.50	91.7	8.3

CONCLUSION

- Cyclic Voltammetry indicated that MIL-100 MOF modified carbon paper (CP/MOF) is more sensitive in venlafaxine determination than bare CP
- In optimum conditions venlafaxine could be determined from 0.05 to 1.5 μM, with a LOD of 0.07 μM.

FUNDING

The authors are grateful for financial support from the project NATURIST 2022.07089.PTDC, (doi.org/10.54499/2022.07089.PTDC) funded by the National Funds through Portuguese FCT—Foundation for Science and Technology, Ministério da Ciência, Tecnologia e Ensino Superior (MCTES).

ACKNOWLEDGEMENTS

This work also received financial support from Portuguese national funds (FCT/MECI, Fundação para a Ciência e a Tecnologia and Ministério da Educação, Ciência e Inovação) through the project UID/50006/2025 - Laboratório Associado para a Química Verde - Tecnologias e Processos Limpos. Petra Albuquerque thanks the project NATURIST 2022.07089.PTDC, (doi.org/10.54499/2022.07089.PTDC) for her research grant. Miguel Tavares and Vitória Dibo are grateful to FCT for their PhD grant (2022.13624.BD and 2023.04202.BD, respectively). Álvaro Torrinha thank FCT for funding through the Scientific Employment Stimulus-Individual Call with ref. 2022.04357.CEECIND (https://doi.org/10.54499/2022.04357.CEECIND/CP1724/CT0015).