

PRINTED SENSORS ON NON-CONVENTIONAL SUBSTRATES

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Background

Printed electronics has emerging as promising candidate in fields like diagnostics or tissue engineering with technological platforms giving feedbacks on biological samples or physiological processes. Moreover, the recent attention for disposable, low-cost and reliable biomolecule-to-chip interface systems is becoming an urgent need due to novel international regulatory guidelines.

Objectives

The aim of this work is to develop a paper-based disposable miniaturized electrochemical platform for protein biomarkers detection, by means of Aerosol Jet Printing, extending the results obtained during previous works performed on ceramic and glass substrates.

Methodologies

AJP with paper-based substrates will allow the development of a new disposable low-cost paper-based platform, combining the high resolution and repeatability of AJP with low-cost and disposable property of paper-based substrates.

Wax printing will give to paper hydrophobic properties in specific areas if necessary: once printed on the surface of the paper, a hot plate melts the wax which penetrates the full thickness of the paper, creating complete hydrophobic barriers.

Sintering of printed lines will be performed thanks to Photonic sintering technique, which allows to sinter on low-temperature substrates like paper.

Electrical, mechanical and electrochemical will be performed to fully test and validate the proposed platform.

Expected Results and Impact

After a preliminary validation in a laboratory environment, the use of paper-based substrates disposable and with peculiar fluid handling capability, will allow to address the optimization of the device for a PoC use, outside the laboratory, directly at patient bed-site or at home.

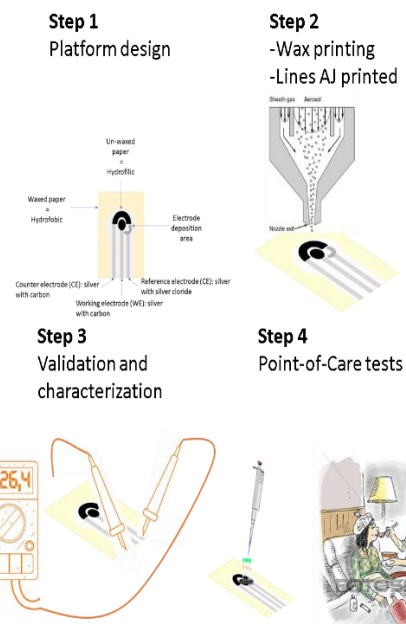


FIGURE 1. A CAPTION HERE.