

**Thesis title:** Tailor-made Chemical Sensing Platforms for Decentralized Healthcare and Wellbeing

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This thesis refers to the social need of the implementation of electrochemical sensors in our daily life at different levels. From a sanitary point of view, the use and real application of user-friendly platforms by the patient itself would facilitate the decision-making process thanks to the obtaining of relevant information and monitoring of a disease. Besides, the use of these tools individually, in health centers or even hospitals, would reduce the cost that healthcare must pay on a daily basis. In a different approach, this type of sensors can also offer other types of applications, which can be applied for environmental or safety purposes. The manufacturing of electrochemical sensors (amperometric and potentiometric) integrated and embedded on different substrates easy to manipulate, low cost and robust (such as textiles, balloons or paper) has been achieved during this thesis. The study of their analytical performance under different mechanical stress and using different biological fluids (detecting ions in sweat or glucose in serum and blood) has also been carried out successfully. These technological contributions are aimed at overcoming the challenges that today's society needs to solve: such as the sustainability of the health system in an aging population; the maintenance of security and general wellbeing; and environmental control. This thesis contributes with huge advancements to face these issues and shows different scientific solutions and useful tools for these challenges that society needs to address.