

Abstract

Hemocompatible Electrochemical Sensors for Continuous Monitoring of Blood Parameters [†]

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Abstract: The real-time monitoring of physiological parameters is essential for point-of-care testing. While nowadays routine tests are done through ex vivo analysis on frequently extracted blood, placing implantable sensors monitoring key blood parameters such as lactate, glucose, ions, and oxygen would mean a giant step forward in the care of critically ill patients, improving the response time in emergencies and diminishing the invasiveness of the measurements. The recent advances in microelectronics and nanotechnology are a promising technology enabling moving in that direction. The goal of our work is to develop arrays of electrochemical sensors with selective and hemocompatible coatings, allowing for the future implementation of such measurements in patients. We perform the analysis of blood parameters in a label-free and electrochemical manner which is compatible with the inevitable miniaturization in a real application. The tuneable composition of the layer will allow to pursue further applications in the future by modification of the receptor molecules and their concentrations.

Keywords: blood gas analysis; physiological parameters; point-of-care; implantable sensor; hemocompatible coating; electrochemical detection; biosensor

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