This project was funded by the European Union Horizon Europe EIC Pathfinder Open 2023 under grant agreement No 101130395

Sustainability? It involves paper, and goes beyond

The EIC Pathfinder "Phoenix-OoC" project introduces paper-based origami configuration to develop sustainable organ-on-a-chip devices

For years the watchword "sustainability" has been applied to countless fields of daily life, and to research as well. In a sector as specific as analytical chemistry, the development of sustainable devices has been boosted by introducing paper-based microfluidic analytical devices (µPAD), the benefits of which, however, are not limited to the concept of sustainability. Paper, as a functional material, gives µPAD unprecedented characteristics. However, paper-based devices are mainly only exploited as analytical instruments, but have not (yet) been developed in the Organ-on-Chips (OoC) world.

The objective of the Phoenix-OoC project is to change this scenario, starting from the experiences of the various partners: Professor Goran Stojanović (University of Novi Sad), Dr Javier Ramon Azcon (Institute for Bioengineering of Catalonia), professor Kersti Hermansson (Uppsala University), Dr Luca Fiore (Sense4Med), Dr Valentina Basoli (University of Basel) and the coordinator, professor Fabiana Arduini (University of Rome Tor Vergata), with twenty years of experience in miniaturized electrochemical sensors.

And the answer lies in a simple element: Paper. "To change the scenario in the field of chips and make it more sustainable, we have long experience since replaced plastic with paper, creating plastic free devices - explains professor Fabiana Arduini, coordinator of the project - then, in the last ten years, we have shown that the use of paper does not only provide green imprinting, but it implements analytical performances of the analytical tool in an important way".

The new project builds on these results and aims to go further. "The main innovative concept lies in the introduction of technology that uses paper as a functional material in the field of OoC", she continues. The Pathfinder Phoenix-OoC project aims to produce smart and sustainable OoC that can be used in the near future by pharmaceutical and biotechnology companies that need to conduct drug screening, as well as physicians working with personalized treatments. "The ultimate goal - closes Professor Arduini - is to open the way to a radically new technology in the field of OoC". ■

The Phoenix-OoC project staff