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SWINOSTICS

SWIne diseases field diagNOSTICS toolbox

European Commission

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 771649

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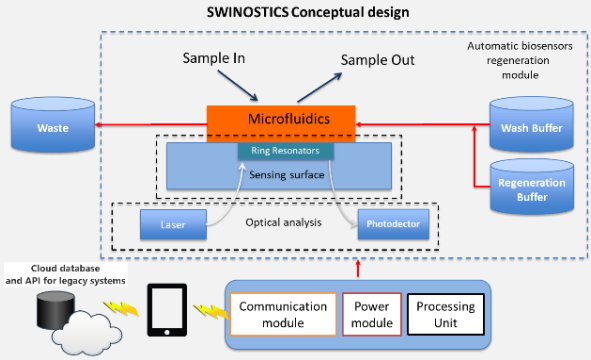
THE DEVICE

The **SWINOSTICS** device aims to perform fully automated analysis of different types of pig body fluids, in order to early detect the presence of six important, swine, virus-generated diseases (ASF, PRRS, H1N1, PPV, PCV2, CFS). Hence, it requires the combination of several scientific fields and sub systems.



The core of the device consists of a **photonic system**, which requires: a) the **fluidic** system for the transportation of the sample, b) a **biological** system for specificity, as well as, c) an **electronics'** system which transcribes the response from the sensing system, via a signal which the d) **software** layer is able to interpret.

PHOTONICS SUBSYSTEM

The photonics subsystem includes the sensor (photonic integrated circuit - PIC), which the optical components (laser, photodetectors) interrogate to retrieve the signal output (measurement).

In order for the device to be applicable in real-world scenarios, the SWINOSTICS device replicates its sensing parts, hence increasing the number of analysed samples per test and being more precise against false positive or negatives.

BIOLOGICAL SUBSYSTEM

The biological subsystem is a layer located on top of the sensor, providing **SWINOSTICS** with the specificity required to distinguish the target viruses from bacteria and from other virus strains as well. SWINOSTICS exploits the unique characteristics of monoclonal antibodies, in order to differentiate the target viruses and increase the device specificity.

FLUIDICS SUBSYSTEM

The fluidics subsystem is responsible for transporting the different reagents and the sample over the sensing surface to perform the analysis. This system is also responsible for the collection of all waste reagents, after carrying out the assay.

ELECTRONICS SUBSYSTEM

It controls and transcribes the response from sensors into a measurable signal to be used by the device. It also supplies power to all the subsystems in the device, communicating with the device's top layers and controlling all the subsystems, running in the background.

SOFTWARE

It allows for the human interface and enables device control. Among the tasks handled by the software is the presentation and storage of the analysis results (on a tablet). It also manages the database with all assays' history, simplifying reporting and long-term analysis (on a cloud platform).