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PROJECT OVERVIEW

PoC-BoSens

PhotonicSensing Dissemination Event

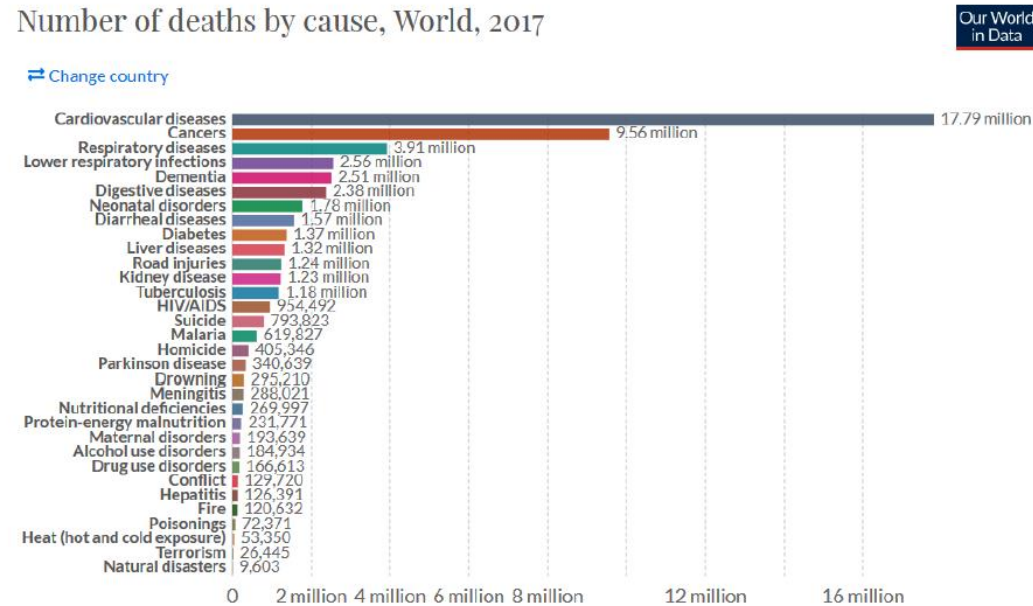
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Motivation

Population density acceleration and urbanization in the world demand better Prevention, Diagnosis and Treatment of diseases

Number of deaths by cause, World, 2017



Source: IHME, Global Burden of Disease

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www.britannica.com/explore/savingearth/population/



<https://gaucherdiseasenews.com/2017/09/19/study-contents-that-non-gaucher-specialists-need-guidance-to-help-them-diagnose-it/>

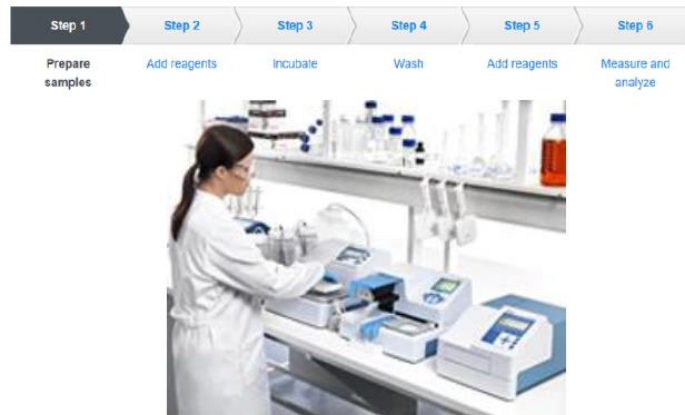
New diseases (e.g., COVID-19) need fast and reliable diagnostic tests

The specific issue

Innovative diagnostic tests are based on cytokine determination in cellular stimulation assays in order to determine antibodies for infectious and autoimmune diseases. **However these tests are extremely expensive and require special (ultra-sensitive) equipment. Samples must also be measured within 24 hours!**

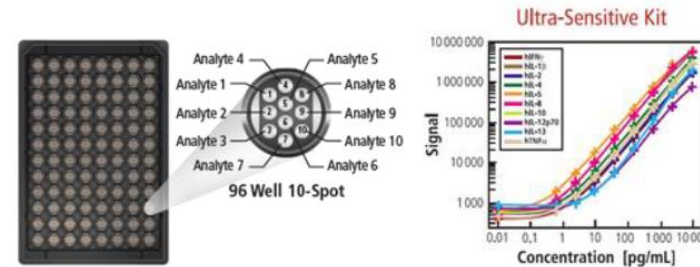


ELISA



<https://www.thermofisher.com/de/de/home/life-science/antibodies/immunoassays/elisa-kits/elisa-instruments-equipment.html>

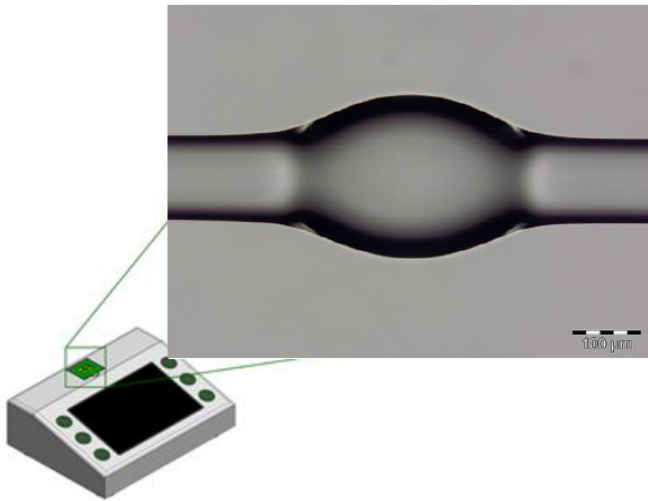
Microarray



https://www.mesoscale.com/en/technical_resources/our_technology/multi-array

The solution

PoC-BoSens is a label-free PoC device based on 3D photonic Bottle microresonators for real-time high-Sensitive measurement of disease relevant biomolecules



The project is focused on the development of a compact and portable device where:

- ✓ Bottle microresonators are assembled in an optofluidic cartridge
- ✓ 4 cytokines to be simultaneously detected from a few drops of sample in 15 minutes
- ✓ A signal enhancement method is investigated to reach the required detection limit
- ✓ The use of expensive readout components is avoided

Technology Concept

The PoC-BoSens analysis platform is based on innovative photonic technologies to achieve a high-sensitive, compact and low-cost solution for fast detection of 4 cytokines

Photonic sensing technology

- ✓ Low detection limit (ng/mL – pg/mL)
- ✓ High integration level
- ✓ Moderate-high multiplexing level
- ✓ Compatible with CMOS-based photonics

Biofunctionalization

- ✓ Selective immobilization for each cytokine
- ✓ Scalable process for mass production
- ✓ Enhanced detection limit

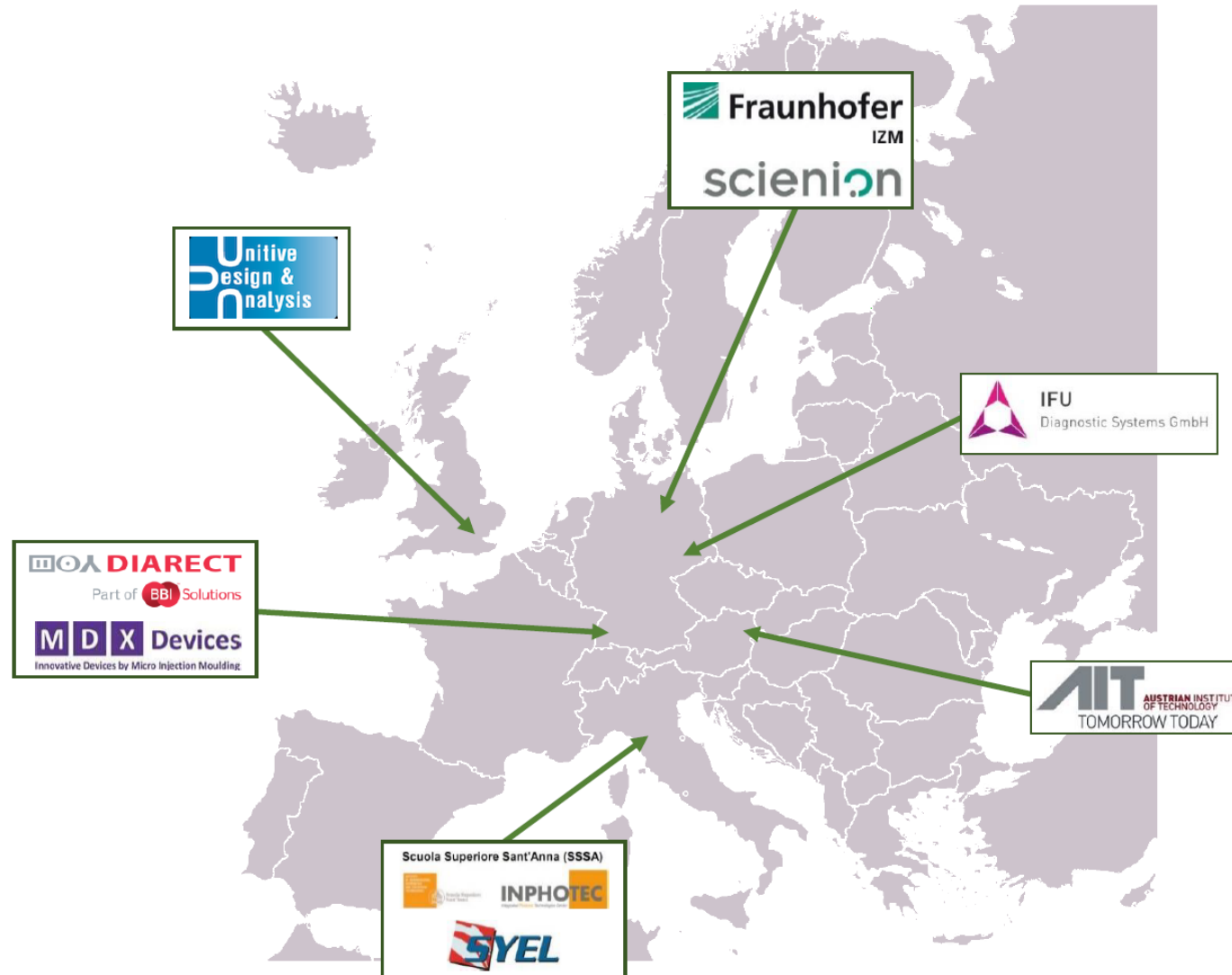
Microfluidics

- ✓ Low-cost fabrication and materials
- ✓ High biocompatibility

Readout

- ✓ Allows having low cost, compact and lightweight readout platform with fast measurement

Team



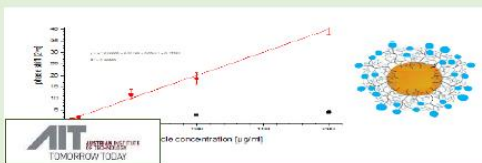
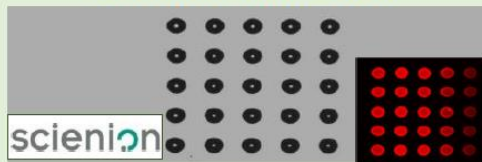
Project development

RESEARCH & INNOVATION

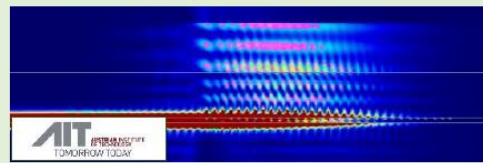
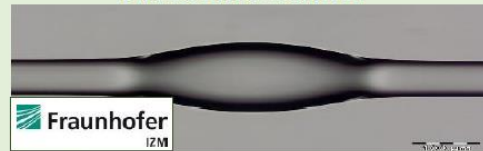
Biorecognition assay



Biofunctionalization



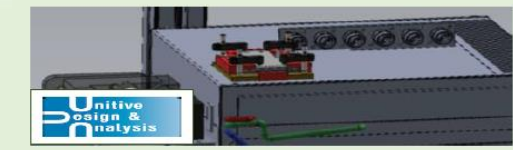
Photonic sensor



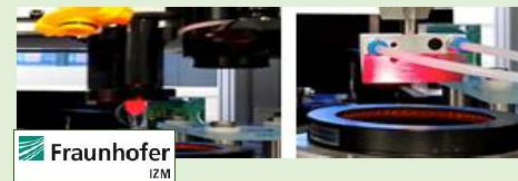
Microfluidics



Readout platform



Integration & Packaging



Validation, Risk & Commercial assessment

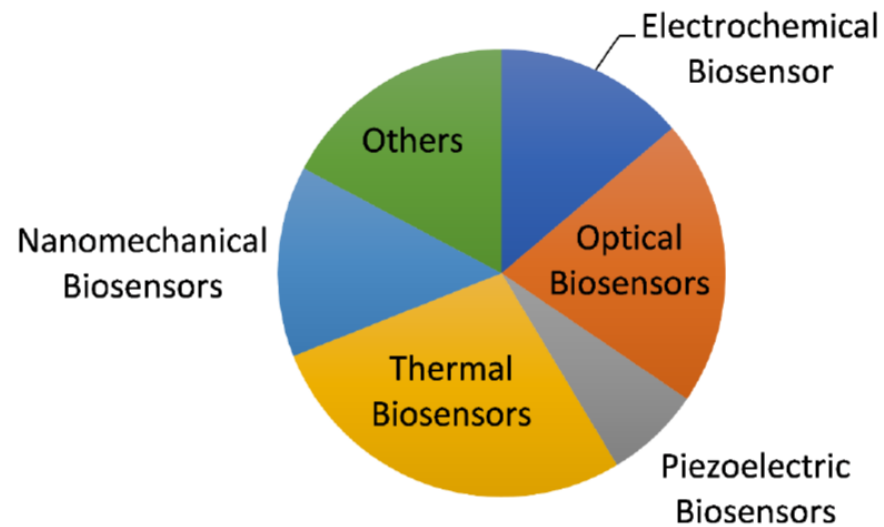


Market opportunity

Optical biosensors market continues to rise thanks to new technologies such as PoC-BoSens

Biosensors Market, By Technology , 2020-2029

(CAGR of 8.63%)



<https://www.researchformarkets.com/reports/global-biosensors-market-619262>

Thank you for your attention!

PoC-BoSens

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<http://www.poc-bosens.researchproject.at/index.php>