

POSITIVE

A highly integrated and sensitive POrous SIlicon based lab on a chip for multiple quantitaTIVE monitoring of Food allergies at point of care.

Keywords:

Lab on a chip

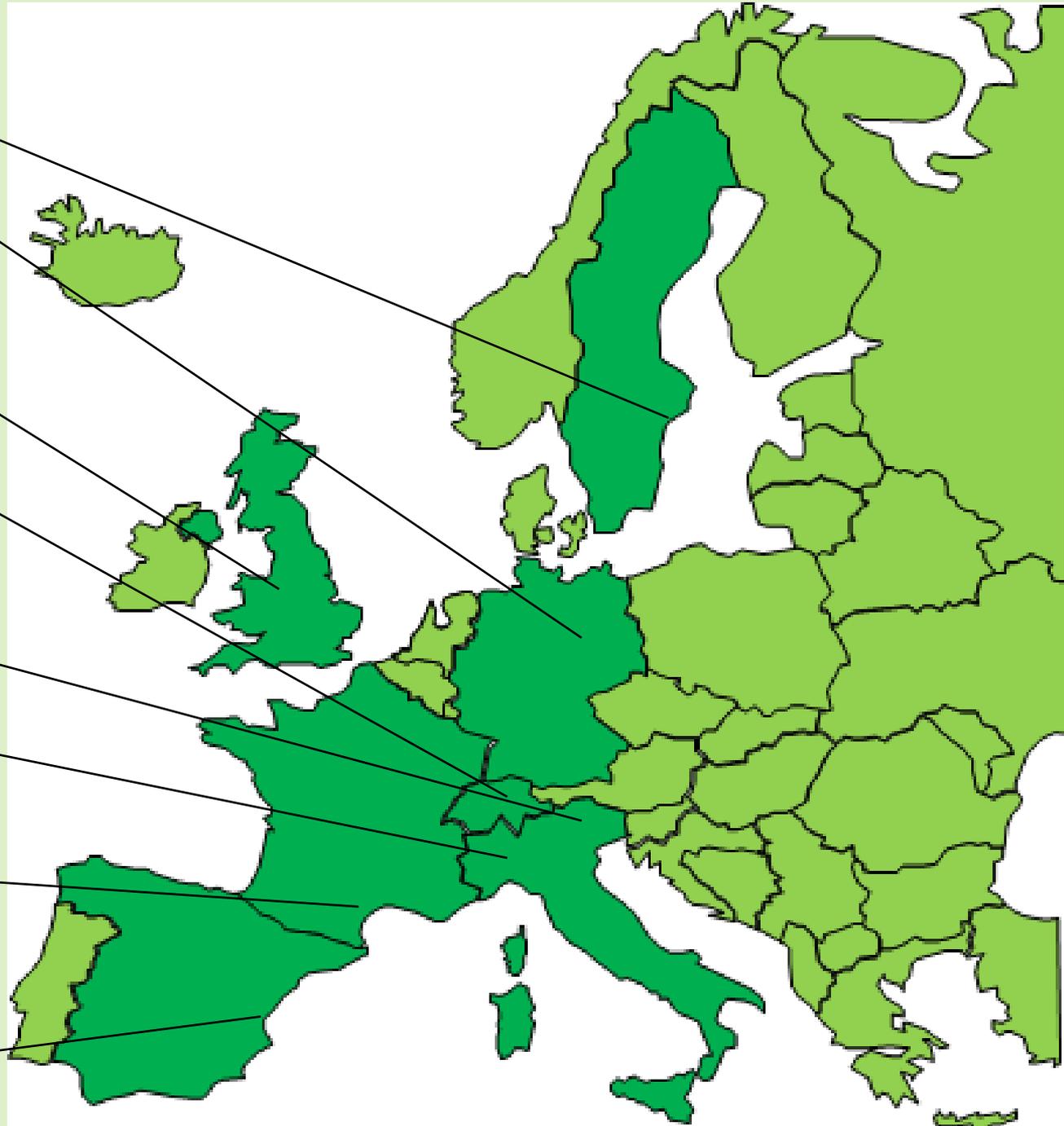
Rapid cost-effective multiplexed biochip
integrated sample preparation

Microfluidic

Porous silicon

portable label-free multiallergy diagnostic
biomolecular recognition optical sensor

Contact information: www.fp7positive.eu



About food allergies

Food allergies – sensitization to food products

Life threatening:

Can provoke clinical reactions whose most severe is anaphylaxis, with respiratory and/or cardiovascular problems that might result in death.

They are common in 1-2% of adults and up to 8% of children, corresponding to a serious public health problem that affects over **15 million people in Europe** from infants to the elderly and its prevalence is increasing.

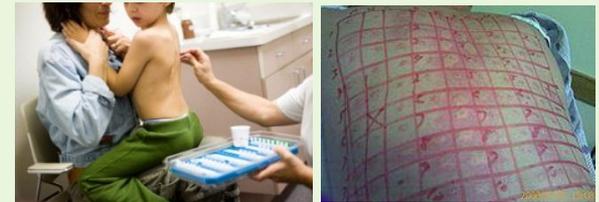


Current diagnostic technology:

Skin prick test - has its limitation.

Alternatives are blood based tests, mostly using the FEIA, RAST and ELISA techniques, usually lab-based.

Point-of-care devices exist; but only a few allergens at a time and give at best semi-quantitative determination.



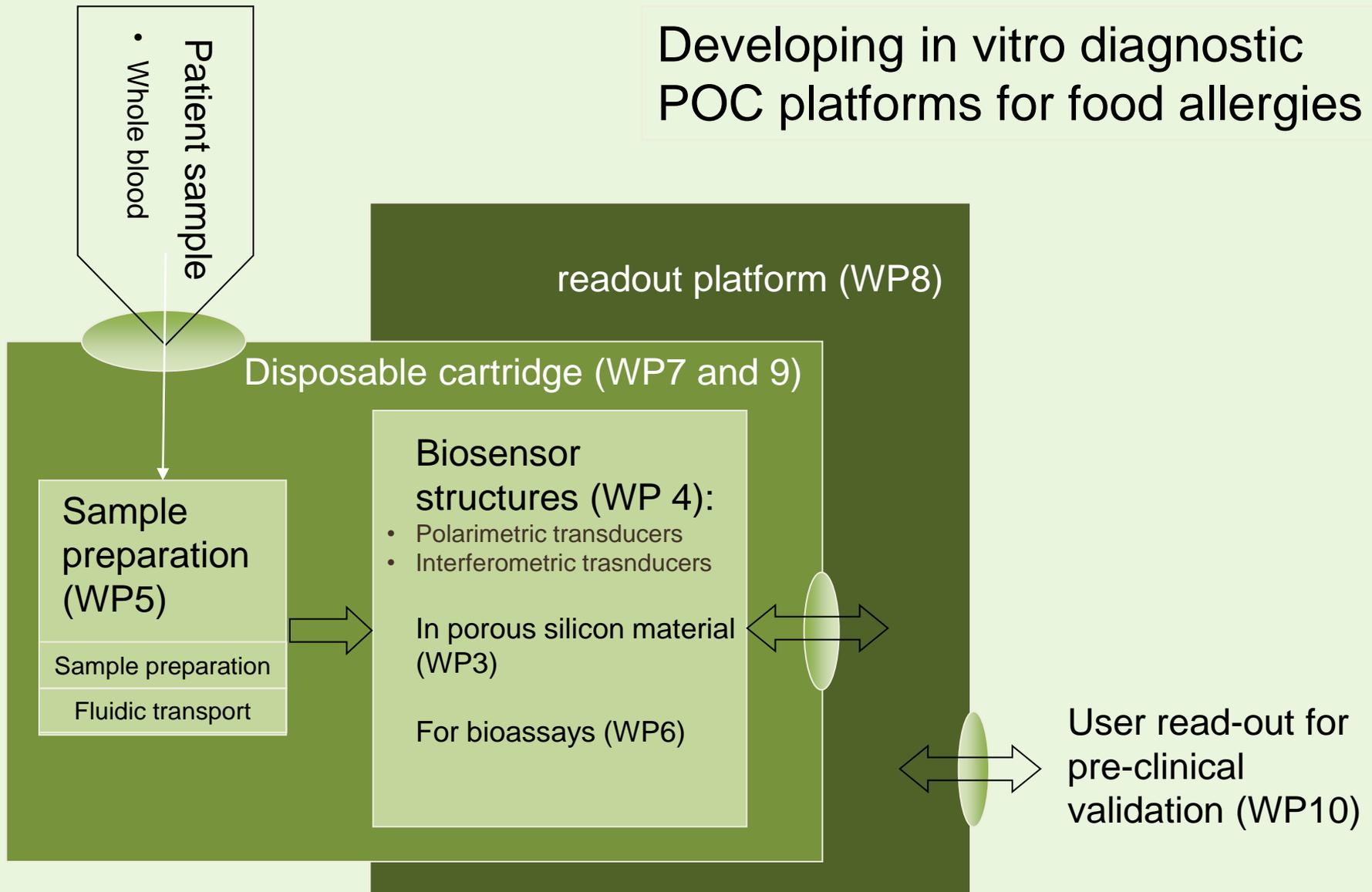
POSITIVE technology:

100µL whole blood sample

Sensitization determination to 10 food allergies in 15'

Positive diagnostic procedure

Developing in vitro diagnostic
POC platforms for food allergies



Sample preparation and transport

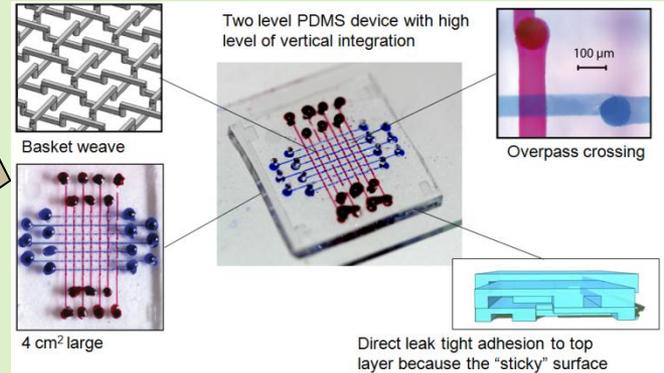
Filter mechanism
for separation of
serum from blood

Whole
blood



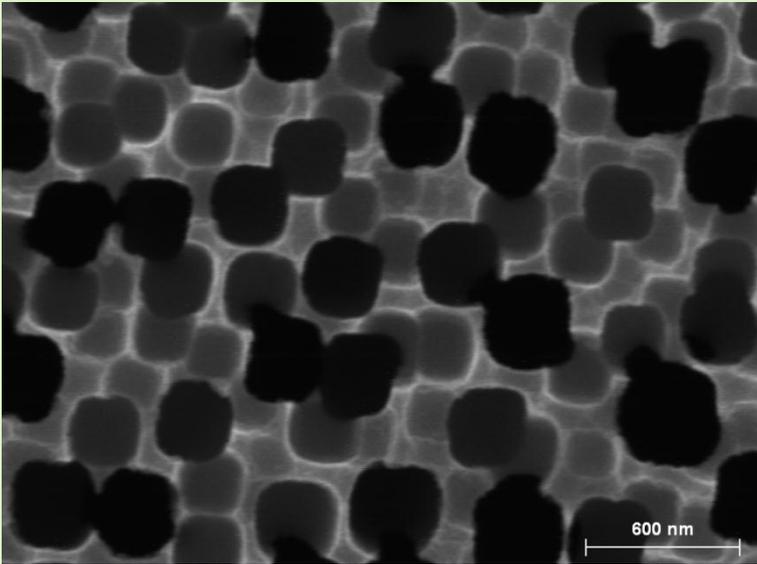
Serum

Transport to transducers



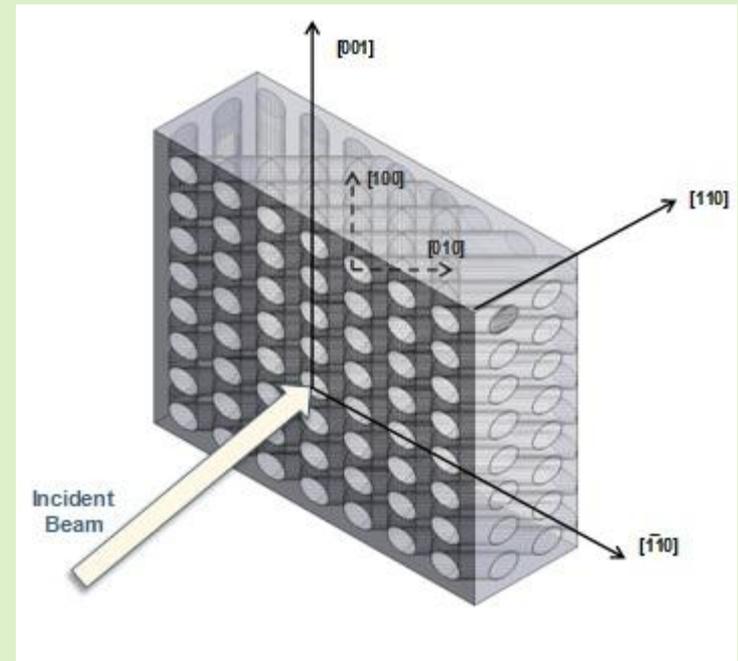
To trans-
ducers

Porous silicon transducer material and mechanisms



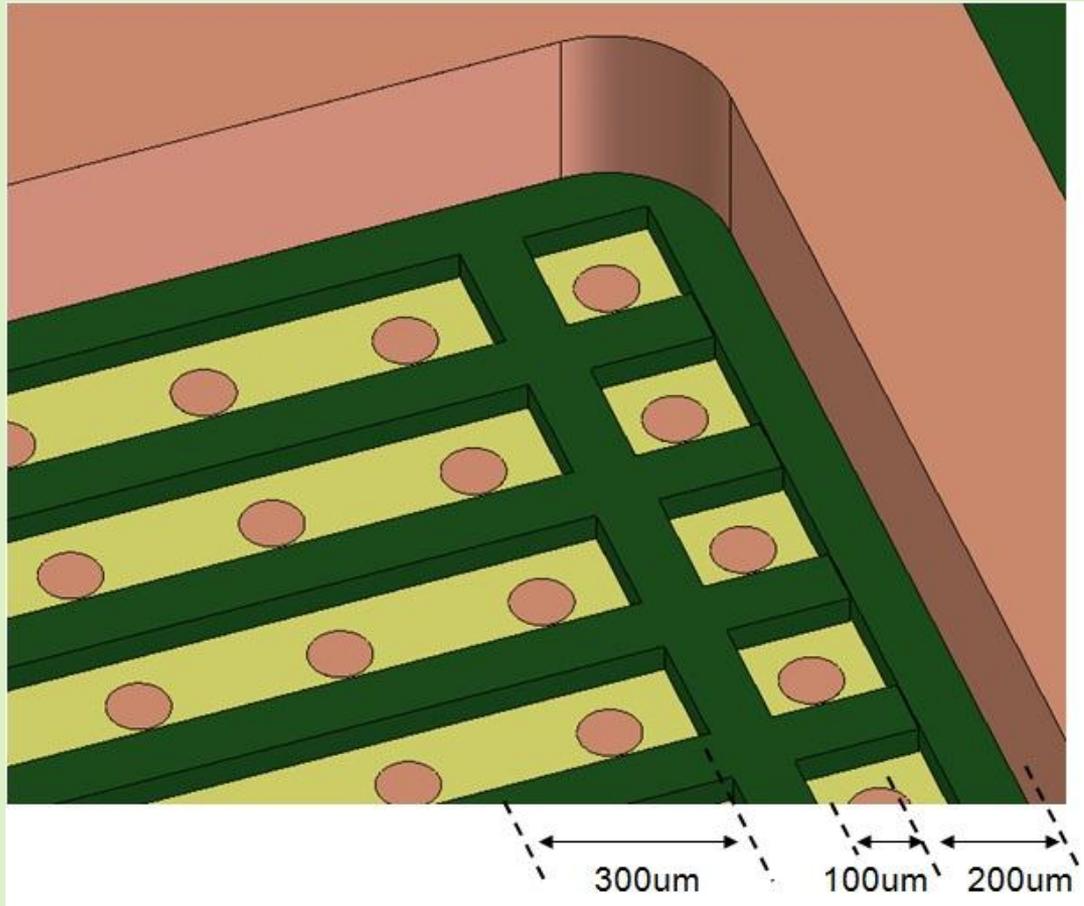
Porous silicon sample made at UNITN,
electron microscope image
courtesy of University of Valencia

Polarimetry schematic,
courtesy of University of
Valencia



Functionalized porous silicon with surface based immunoassays
with sensing by two different transducer mechanisms

Porous silicon transducer arrays



Arrays of optical transducers with surface based immunoassays