

# OPTOLABCARD...



SIXTH FRAMEWORK PROGRAMME

Mass produced optical diagnostic labcards based on micro and nano SU8 layers **and its evolution.**

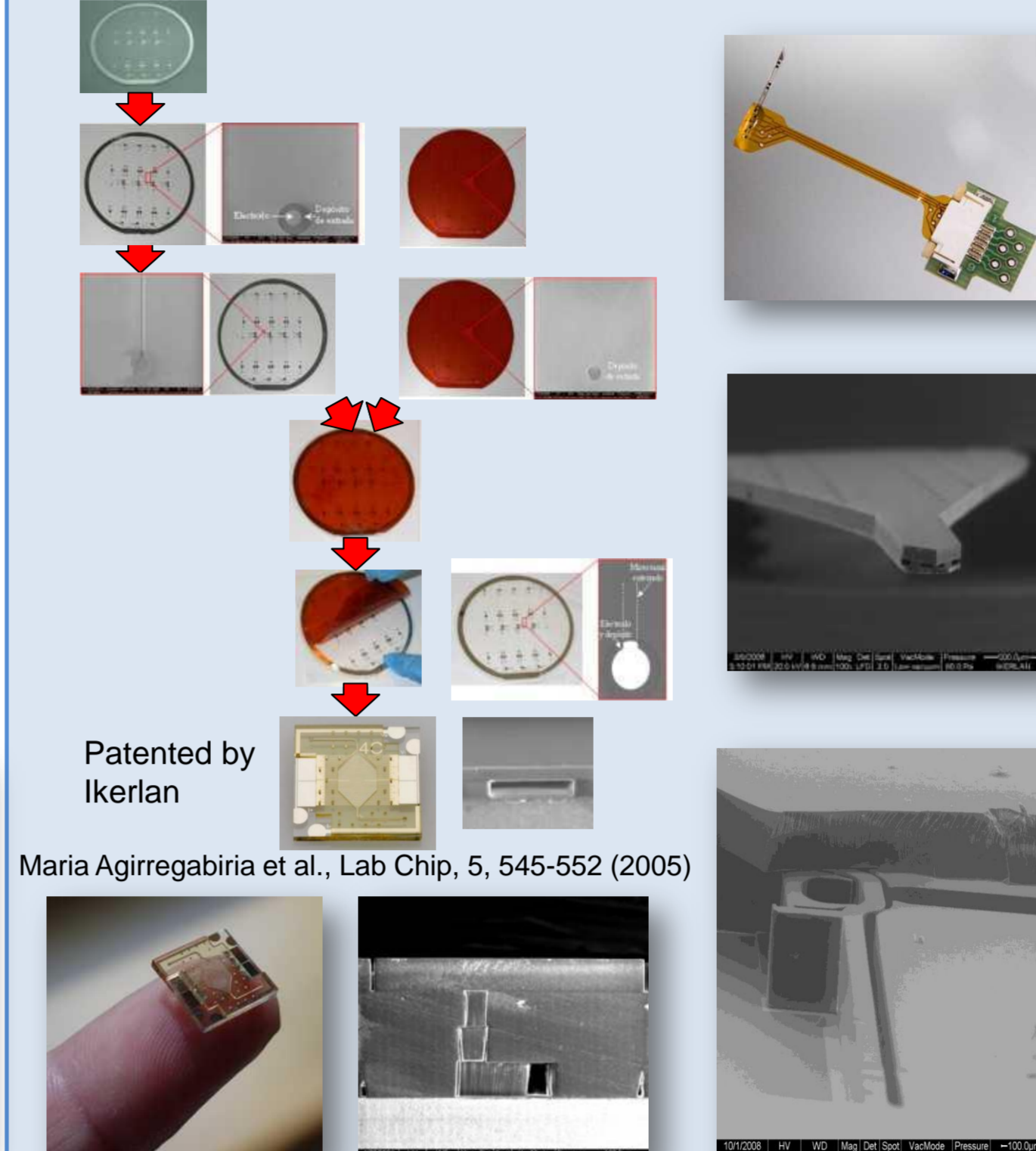
## Project Objectives

- ❑ To develop an instrument that will carry out a Real Time Polymerase Chain Reaction automatically from sample preparation to an optical detection in 15 minutes
- ❑ To extend the use of thick photoresist process for Lab on a Chip/Card applications obtaining a protected and disruptive technology.
- ❑ To obtain 10 fold better results than conventional gel electrophoresis.
- ❑ To manufacture a diagnostic disposable labcard at a cost of 1-2 euros with these dimensions 95 x 60 x 5 mm.
- ❑ To provide:
  - ❑ Better service to patients
  - ❑ Pathogen free environment by rapid monitoring

## POC instrument



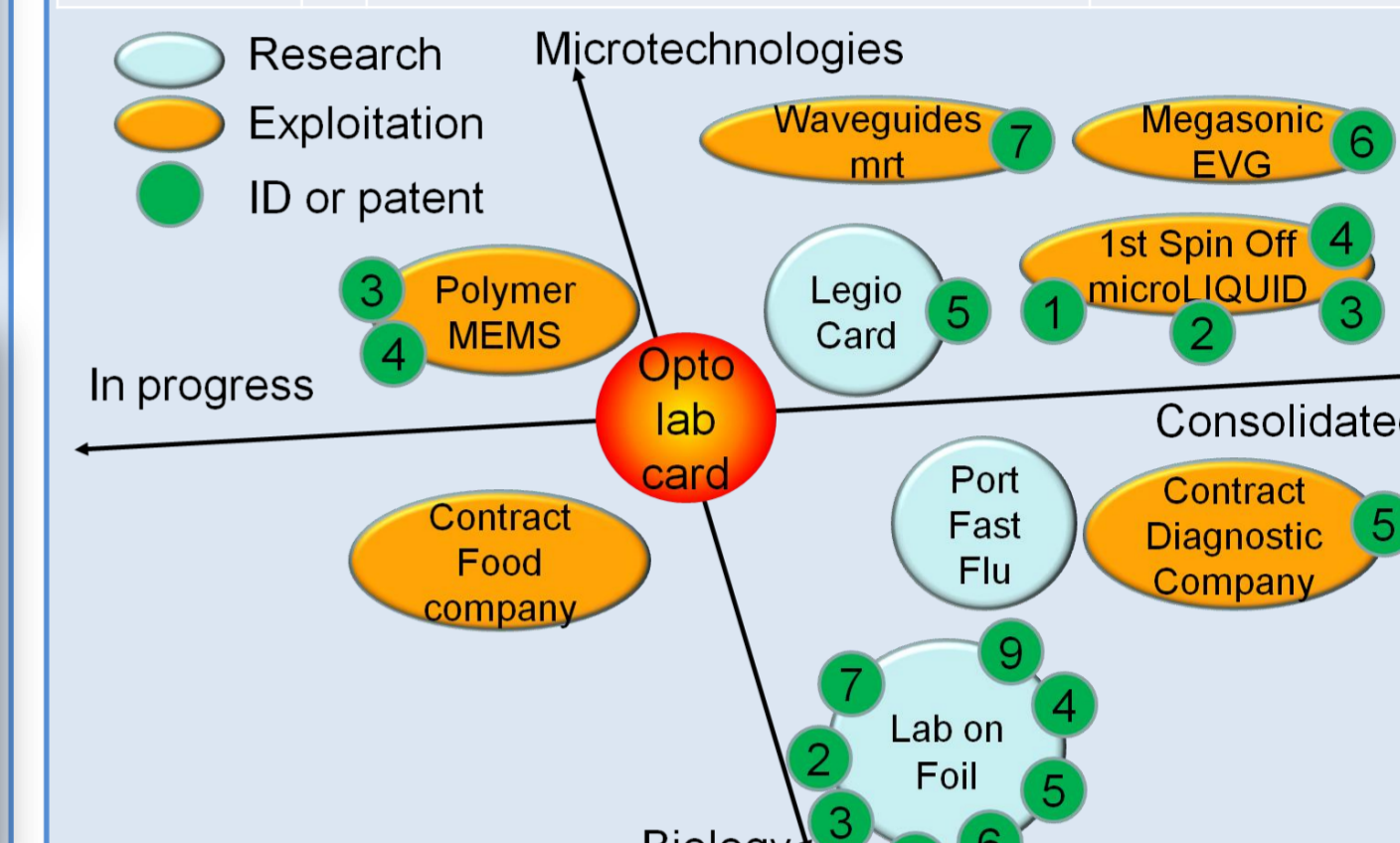
## Dry film prototypes



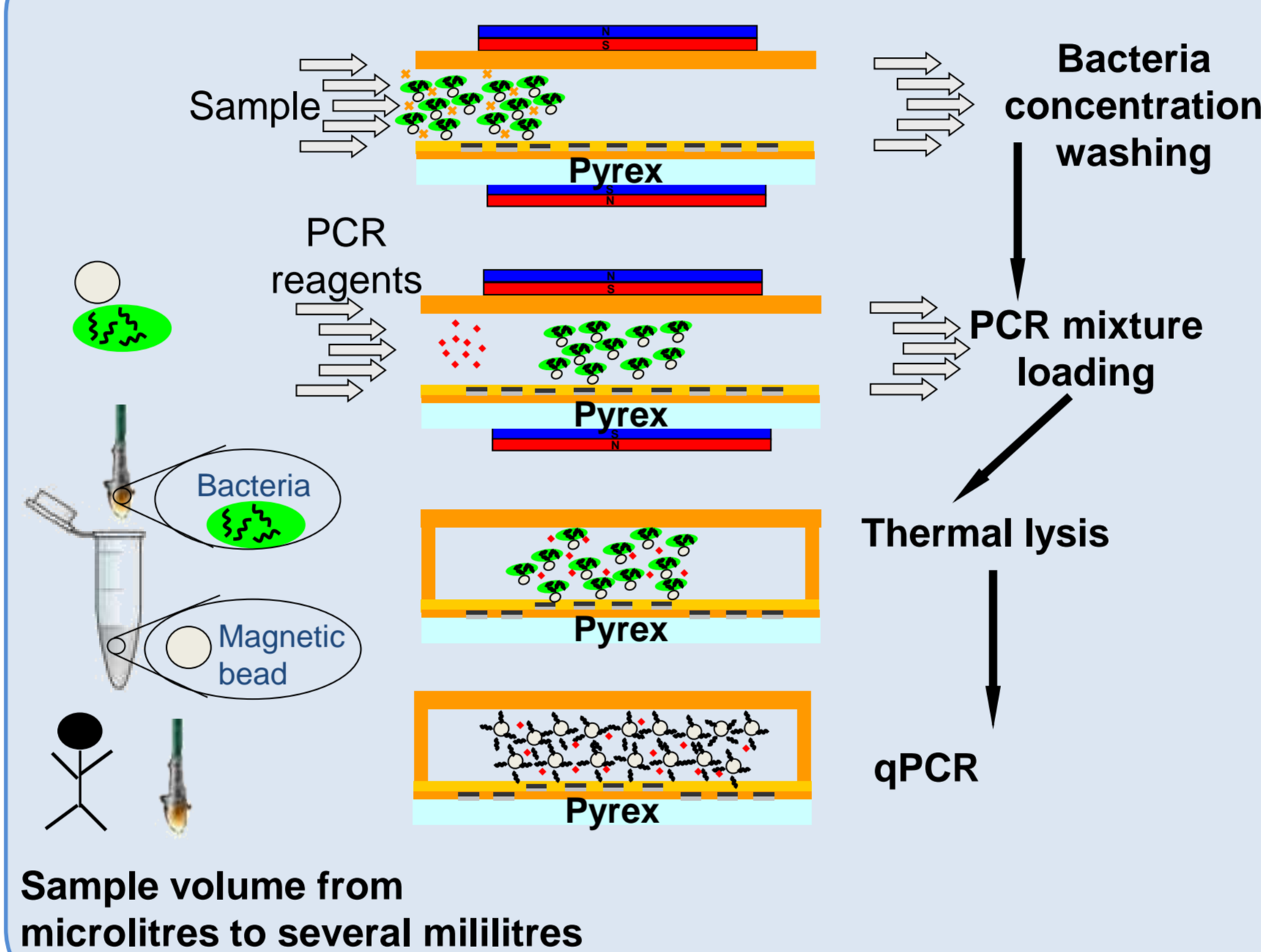
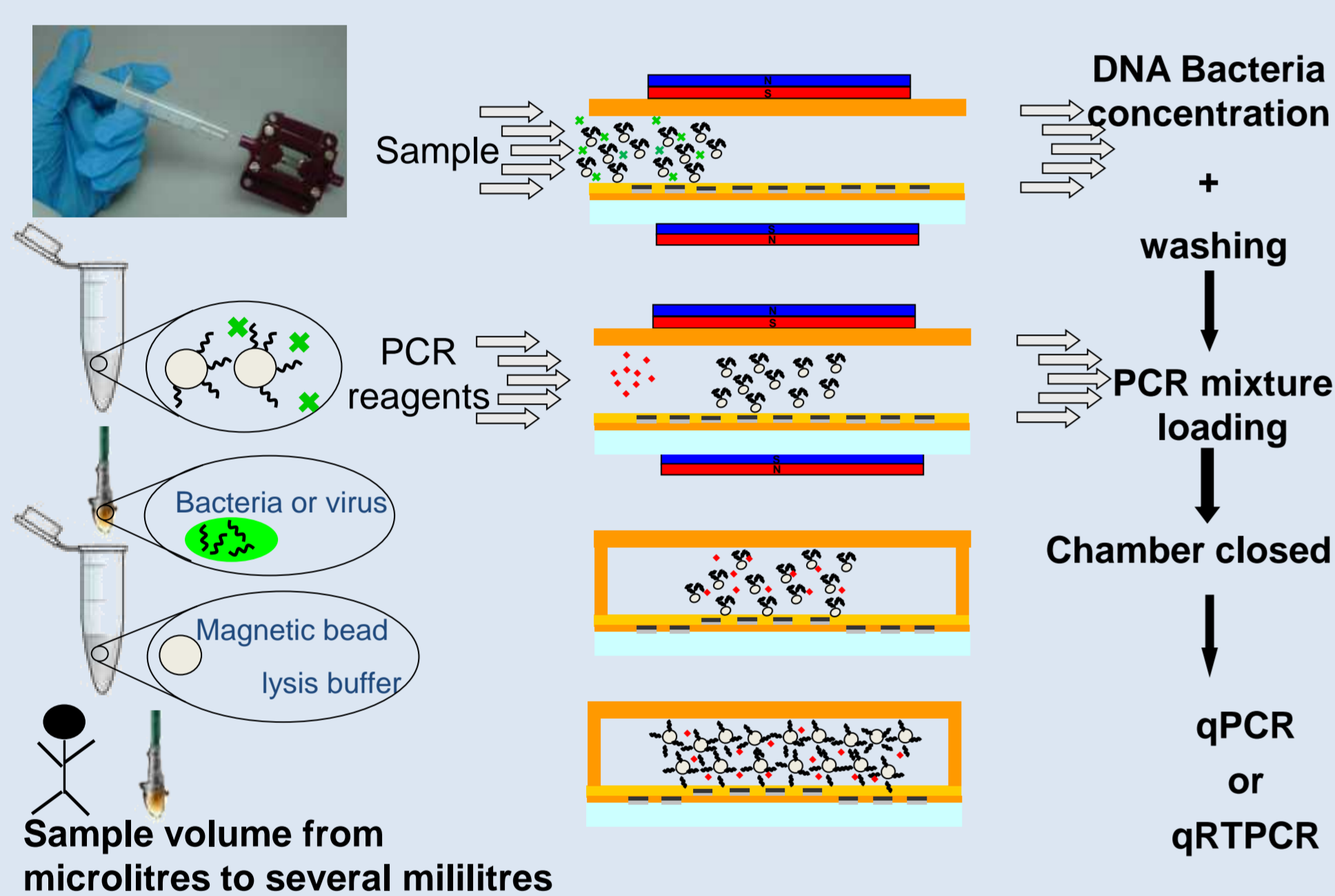
Patented by Ikerlan  
Maria Agirregabiria et al., Lab Chip, 5, 545-552 (2005)

## Gold Nuggets

| OWNER   | N | INTELLECTUAL PROPERTY           | Status       |
|---------|---|---------------------------------|--------------|
| IKERLAN | 1 | Procedure for the fabrication   | PCT Granted  |
|         | 2 | Flexible Microfluidics          | PCT Granted  |
|         | 3 | PCT Granted                     | PCT Granted  |
| GAIKER  | 4 | Method and device amplification | PCT Granted  |
| EVG     | 5 | Megasonic developer bath        | Confidential |
| Mrt     | 6 | Waveguiding material            | Confidential |
| VET     | 7 | Freeze dried reagents           | In progress  |
| ITE     | 8 | Optics external integration     | In progress  |



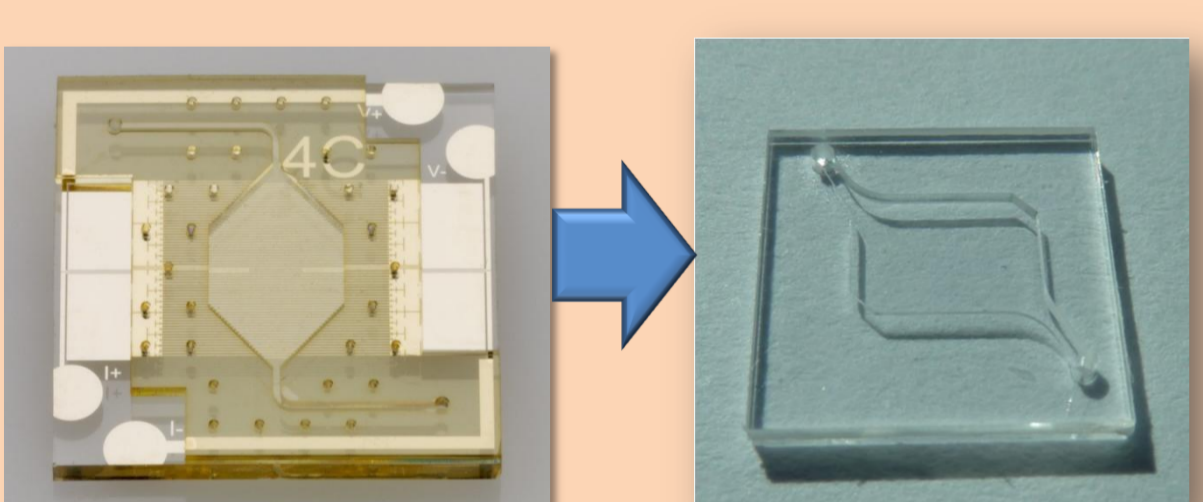
## Two methods for Nucleic Acid Concentration and Amplification



## Validation with real samples

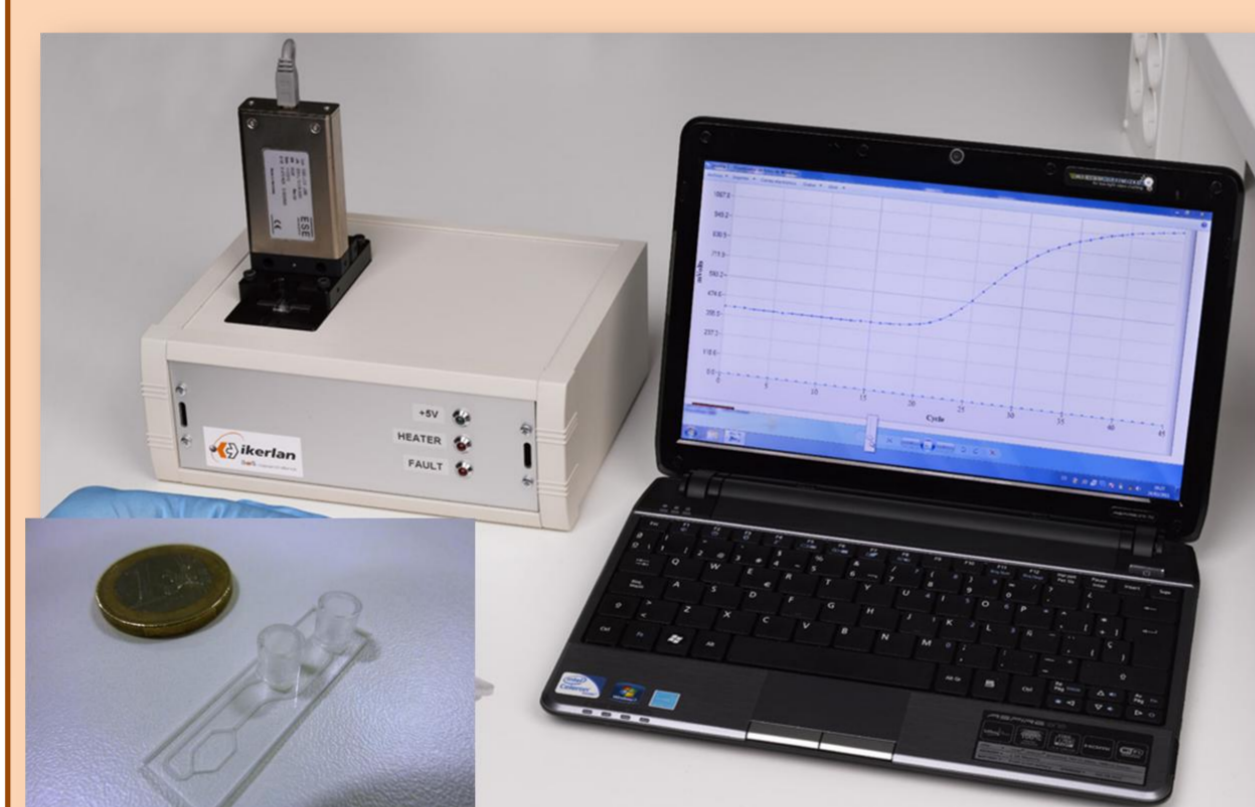
- ❑ *Salmonella spp.* clinical prevalidation
    - Clinical Samples provided by Hospital Donosti
    - Validation of the amplification itself (67 chips),
    - Full analyses with clinical samples and the chip for the detection of *Salmonella spp* (30 chips).
    - Femtograms of DNA in 30 minutes
  - ❑ *Campylobacter spp.* farm prevalidation
    - Samples provides by a Danish Farm
    - Out of 48 samples, 36 samples are cloacal swabs, four sock-samples and 8 commercial packed chicken
    - Femtograms of DNA in 30 minutes
  - ❑ Influenza virus detection\*
    - Nasopharyngeal samples from Hospital Donostia.
    - Results confirmed the proper performance of on chip RNA extraction and capture protocol
- \* Within Portfastflu EU project by Genewave

## Evolution 1: From SU8 to COC

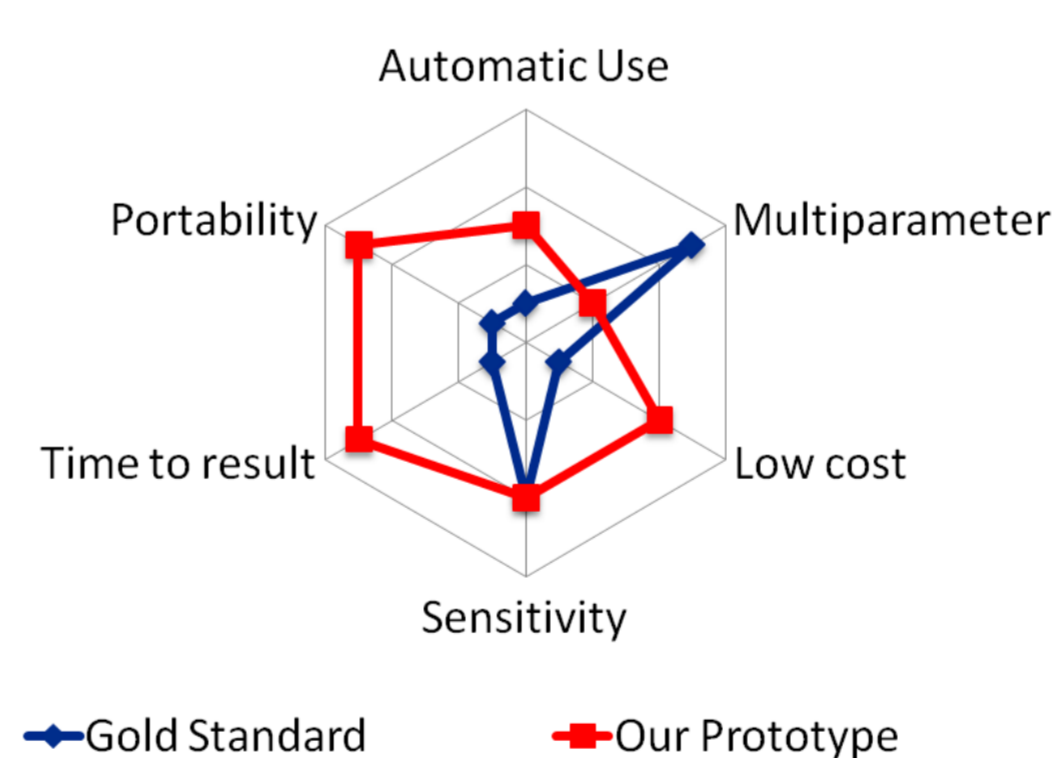


- ❑ Lower cost, no heater integrated
- ❑ Very low autofluorescence
- ❑ Higher reproducibility, simple process
- ❑ Lower non-specific adsorption

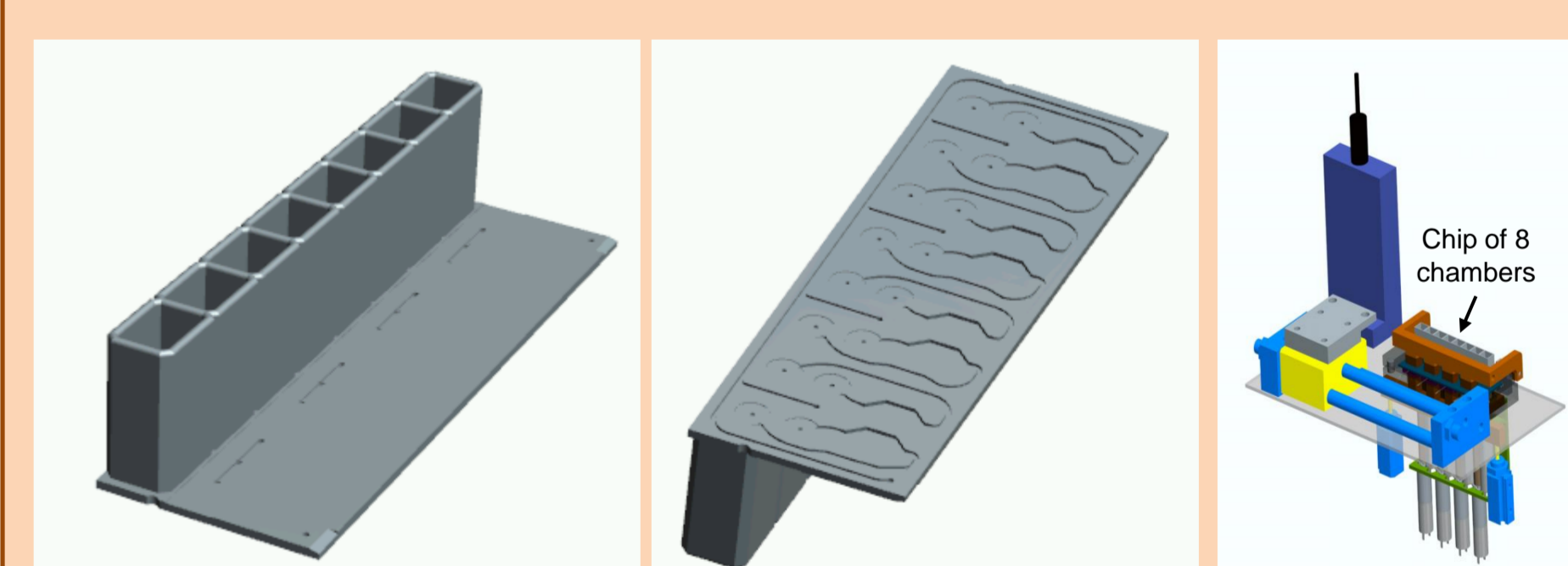
## Evolution 2: A system



A system with Integrated valves for automatic sample preparation and two fluorophores detector



## Evolution 3: A multiplex system



A system with chambers with Integrated valves for automatic sample preparation and two fluorophores detector per chamber

## Exploitation



- |                       |                         |      |
|-----------------------|-------------------------|------|
| 1. Disposable LOCs    | ✓ Low cost              | 100% |
|                       | ✓ Easy replacement      | 100% |
| 2. Sample preparation | ✓ Pathogens             | 100% |
|                       | ✓ Virus                 | 75%  |
| 3. Easy to handle     | ✓ Automatic injection   | 100% |
|                       | ✓ Thermal-Optical       | 100% |
| 4. Validation issues  | ✓ Prevalidation carried | 100% |
|                       | ✓ 8 Multiparameter      | 100% |

We offer this multiplex system to a company that has:

- A market vision and need
- A exploitation leading role by:
  - Subcontracted project
  - A participation in a R4SME EU project



DTU Nanotech  
Department of Micro- and Nanotechnology



DTU Vet  
National Veterinary Institute



### Project Partners

- IKERLAN-IK4, S.Coop. (Project Coordinator) -Spain-
- GAIKER-IK4 Technological Centre -Spain-
- Sillex Microsystems -Sweden-
- Dept. Micro and Nanotechnology (Technical University of Denmark) -Denmark-
- National Veterinary Institute (Technical University of Denmark) -Denmark-
- Fundación Vasca De Innovación E Investigación Sanitarias -Spain-
- Micro Resist Technology -Germany-
- EVGroup E. Thallner GmbH -Austria-



Supported by FP6

### Contact

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www.ikerlan.es  
Web site: www.optolabcard.com  
Timeline: Start: 1-9-2005  
End: 1-9-2008  
Budget: Overall Cost: 2,9ME  
EC Funding: 1,6ME  
Contract number: 016727