



Contract no. 224306

## LABONFOIL

### Laboratory Skin Patches and SmartCards based on foils and compatible with a Smartbiophone

INSTRUMENT: Large-scale integrating project (IP)

### D14.5 Final report on patents and new research projects

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Responsible partner for deliverable: IK4-IKERLAN

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Dissemination Level		
PU	Public	<input type="checkbox"/>
PP	Restricted to other programme participants (including the Commission Services)	<input type="checkbox"/>
RE	Restricted to a group specified by the consortium (including Commission Services)	<input type="checkbox"/>
CO	Confidential, only for members of the consortium (including Commission Services)	<input checked="" type="checkbox"/>



**Project coordinator:** IK4-IKERLAN

**Responsible Partner for this Deliverable:**

TATAA



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## 1. INTRODUCTION

The impact of LABONFOIL project can be measured by the articles or conferences, but also it can be measured by the research lines in the shape of background, patents, research projects or Spin Offs. This deliverable will describe the LABONFOIL impact in these three forms.

## 2. INTELLECTUAL PROPERTY

There has been an interest to protect the knowledge created by the LABONFOIL. In some cases the knowledge has kept in the form of a partner background (see next table) and in other cases, in the shape of patents (See next section).

IP	Leaders	Partners	Patentable
Labcard design	Ikerlan-IK4	DTU-Nano (pumps)	No
Labcard valves	Ikerlan-IK4		Patented
Labcard reader	Ikerlan-IK4		Patented
Reagent on chip	Ikerlan-IK4	Biotoools	Done
Skinpatch	Biosensia	PWR, FhG	No
Solid phase PCR	DTU	Ikerlan-IK4 (chip)	No
Environ. application	NERC	Ikerlan-IK4 (chip)	Under study
CRC application	Gaiker-IK4 and HC	Ikerlan-IK4 (chip)	No
Solvent bond	Ikerlan-IK4		Under study
Ultrasonic bond	DTU		No
Fabrication tool	EVG		No
SU8 mold	Mrt		No
Sample collector	UoS	NERC	In process
SU8 polymer MEMS	Ikerlan-IK4		Patented
Methodology	Ikerlan-IK4		Under registration
Flex. OLED	FhG		In process

Figure 1. List of Intellectual Property, Leaders and Partners.

## 3. PATENTS

During the last period (1-5-2011 to 28-2-2013), there has been filed 4 patents. Besides there is a Trademark registration and a methodology (see next table). These intellectual property in combination with previous period patents and with other research works are creating a family patent that provides protection and support for future exploitation. This exploitation will be carried out by project with third parties and by a Spin off Company called POC microSOLUTIONS.

LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, ETC.					
Type of IP Rights	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) (as on the application)
PCT	YES	07/07/2010	PCT ES2011070291	Method for Producing Microfluid Devices	IKERLAN
PCT	YES	12/11/2012	PCT ES2012070785	Method for Producing a Microfluid Device	IKERLAN
PCT	YES	31/12/2012	PCT ES2012070923	Sistema Potenciador de la Repetitividad y Reproducibilidad en Camaras de Reaccion	IKERLAN
PCT	YES	2012	PCT ES2012070887	Device to provide samples	IKERLAN
Registered Methodology	YES		Under progress	Method to develop IVD systems based on LabonaChip	IKERLAN
Trademark	YES	2009		SmartBioPhone	IKERLAN

**Figure 2.** Last period results in terms of patents, trademarks, registered methodologies.

### 3.1 Family Patent

The previous patents together with the already existing ones provided a sound list of protected knowledge.

- ***Method for obtaining microfluidic polymer structures***
  - Applicant: IKERLAN
  - Request Spanish Patent con nº E200600071 , date 12/01/2006.
  - Concesión Spanish Patent , date 10/07/2007. (BOPI del 16/08/2007).
  - Request PCT ES2007000011 , date 12/01/2007.
  - Request Europea EP07704725.6 , date 15/07/2008. In progress.
  - Request USA US12/160.638 , date 11/07/2008. Concedido en 2012.
- ***Flexible micro/nanofluidic devices***
  - Applicant: IKERLAN
  - Request Spanish Patent con nº E20060132 , date 22/05/2006.
  - Concesión Spanish Patent , date 26/07/2007. (BOPI del 16/08/2007).
  - Request PCT ES2007000296 , date 22/05/2007.
  - Request Europea EP07765875.5 , date 21/11/2008. In progress.
  - Request USA US12/301.967 , date 26/11/2008. In progress
- ***Method for the Production of Micro/Nanofluidic Devices for Flow Control and Resulting Device***
  - Applicant: IKERLAN
  - Request PCT ES2007000622 , date 02/11/2007.
  - Request Europea EP07823028.1 , date 26/04/2010. In progress.
  - Request USA US12/740.824 , date 06/04/2010. In progress
- ***Method and Device for Detecting Genetic Material by means of Polymerase Chanin Reaction***
  - Applicant(s): IKERLAN y GAIKER
  - Request PCT ES2007000163 , date 26/03/2007.
  - Request Europea EP07730404.6 , date 26/10/2009. In progress.
  - Request USA US12/593.283 , date 25/10/2010. In progress.
  - Request India 3365/KOLNP/2009 , date 22/09/2009. In progress.
  - Request Brasil PI0721509-6 , date 28/09/2009. In progress.
- ***SU-8 Microneedles for Monitoring and Stimulating Neurons***
  - Applicant(s): CSIC e IKERLAN
  - Request Spanish Patent con nº E200930430 , date 09/07/2009. Concedida en 2010.
  - Request PCT ES2010070472 , date 08/07/2010. In progress.
- ***Method for Producing Microfluid Devices***

- Applicant: IKERLAN
- Request PCT ES2011070291 , date 25/04/2011. In progress.
- Patente que reclama la prioridad PCT ES2010070468 , date 07/07/2010.
- **Method for Producing a Microfluid Device**
  - Applicant: IKERLAN
  - Request PCT ES2012070785 , date 12/11/2012. In progress.
- **Dispositivo adecuado para Proveer de Muestras Fluidicas en Sistemas de Diagnostico basados en Diagnostico Molecular**
  - Applicant: IKERLAN
  - Request PCT ES2012070887 , date 21/12/2012. In progress.
- **Sistema Potenciador de la Repetitividad y Reproducibilidad en Camaras de Reaccion**
  - Applicant: IKERLAN
  - Request PCT ES2012070923 , date 31/12/2012. In progress.
- **Methodology**
  - Applicant: IKERLAN
  - Besides, through the development experience of the Labcards and Control Unit, we have been able to consolidate a methodology to develop LabonaChip based IVD systems. This methodology allow us to standarise the transfer of tube reactions into a LabonaChip systems.

This list is not going to end since the partners are actively involved in many projects that are allowing to envision new markets and products. This list of projects will be described in the following section. As an example, a new Integrated project has been started where 3 Invitro Diagnostic Systems will be created to diagnosis Non Invasive Prenatal Diagnosis extracting and using the fetal DNA contained in pregnant mothers.

#### 4. OTHER PROJECTS

Other projects obtained through the expertise gained by LABONFOIL and to be included in D14.5	
Name of project or activity	Very brief Description of the project and the relation with LABONFOIL
ANGELAB Integrated Project	An EU project coordinated by IK4-ikerlan where the Labonfoil strategy will be used for Non invasive prenatal diagnostics.
AMIT	Spanish CENIT project where the Labonfoil strategy is used to create a System and a micro Factory (in the shape of a Labcard) to produce radiotracers.
POC microSOLUTIONS	The objective of this spin off company is to design and provide Point of care platforms.
Mastitis	Spanish INNPACTO project with the objective of this project is to develop a POC where mastitis pathogens are detected in milk.
Task Predetec within Basque funded project	The objective of this work is to add to the LABONFOIL Labcard electrodes to carry out DNA electrochemical detection. This will take advantage of the IK4-Ikerlan results on the Labcard and the Control Unit. Integration tests are being carried out.
TNF-Alfa detection	The objective was to use single chamber COC chips to carry out detection of TNF-Alfa by immune-qPCR. The results were very good obtaining 5-100 pgr/ml of protein per millilitre of human plasma. The project as in collaboration with Hospital de Donostia and CIC microGUNE
SMARTDETECT	A portable system for rapid nucleic acid based detection of pathogens. Project funded by Danish Research Council High Technology Fund (HTF) In the project, the parties will develop a portable laboratory that brings together all functions of an analytical laboratory. All the processes from sample preparation, detection of pathogenic microorganisms, reporting the result to a central database will be performed within a chip with a size of a few centimetres from each side.
PINVIALEG	Portable microfluidic-based device for in-situ detection of viable legionella. The project aims to develop a portable microfluidic device composed of a filtration and bacteria collection system and a disposable card (containing a microfluidic chamber for nucleic acids concentration, a microfluidic chamber for RNA amplification, and a detection system based on a NALFIA strip). A new innovative tool will be produced to detect viable Legionella on-site, with rapid result acquisition and easy to use.

**Figure 3.** Projects, tasks, spin offs inspired by the work and results from LABONFOIL.



## 5. CONCLUSIONS

It is clear that this project will go on in the form of multiple ideas, projects, and companies. Besides, this project has created four platforms that are still running and they are capable of more results. Therefore, the consortium is obtaining new results out of the LABONFOIL funding. These results will open new research avenues. Basically, the work carried out to tune and optimise the platforms will not be ended with the end of LABONFOIL project. Partners are committed to keep this research using their own internal resources. The established collaborative links are very strong and will allow us to move forward this research.

As an example there has been an important commitment from the consortium and especially from the Coordinator to have an impact in society. The IK4-Ikerlan Spin off company POC microSOLUTIONS is working on creating this impact.

Another example is the creation of a new project called ANGELAB where some of this instrumentation will inspire new IVD systems for Non Invasive Prenatal Diagnostic Systems. But also projects like Smartdetect, AMIT or Pinvialeg are a clear demonstration of the avenues found by the LABONFOIL project.