Project Number: 610472

A CANcer Development mOnitor

Specific Targeted Research Project

Information Society Technologies

Deliverable D6.13: Update and distribution of promotional material by a newsletter presenting the project and the consortium as well as including publishable project progress/results information.

Due date of deliverable: **28th February 2016**

Actual submission date: **26th April 2016**

Start date of project: 2014-01-01 Duration: 3 Years

Organisation name of lead contractor for this deliverable: **UVEG**

Organisation names of contributors for this deliverable: All

Revision **[1.0]**

Project co-funded by the European Commission within the Seventh Framework Programme		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

1 Document History

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Lead author: UVEG
Authors: Christoph Krafft, Iwan Schie and Andrés Cantarero
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2 Executive Summary

The first objective of the document is to describe shortly the information that all the promotional material includes and enumerate the promotional channels chosen to publicise the project and its recent advances.

The content of the document therefore has two parts. Firstly, the main information and the dissemination channels are described. Secondly, examples of the promotional material issued are shown.

The present deliverable informs about the production and distribution of the third newsletter. The remaining documents are unchanged.

3 Deliverable structure

Table of Contents

4 Description of work performed

4.1 Promotional material

The general information included in all the promotional material is the following:

- Introduction to the CanDo project and its consortium.
- A description of technical achievements to date within the project
- A description of the Gilupi Cellcollector®.

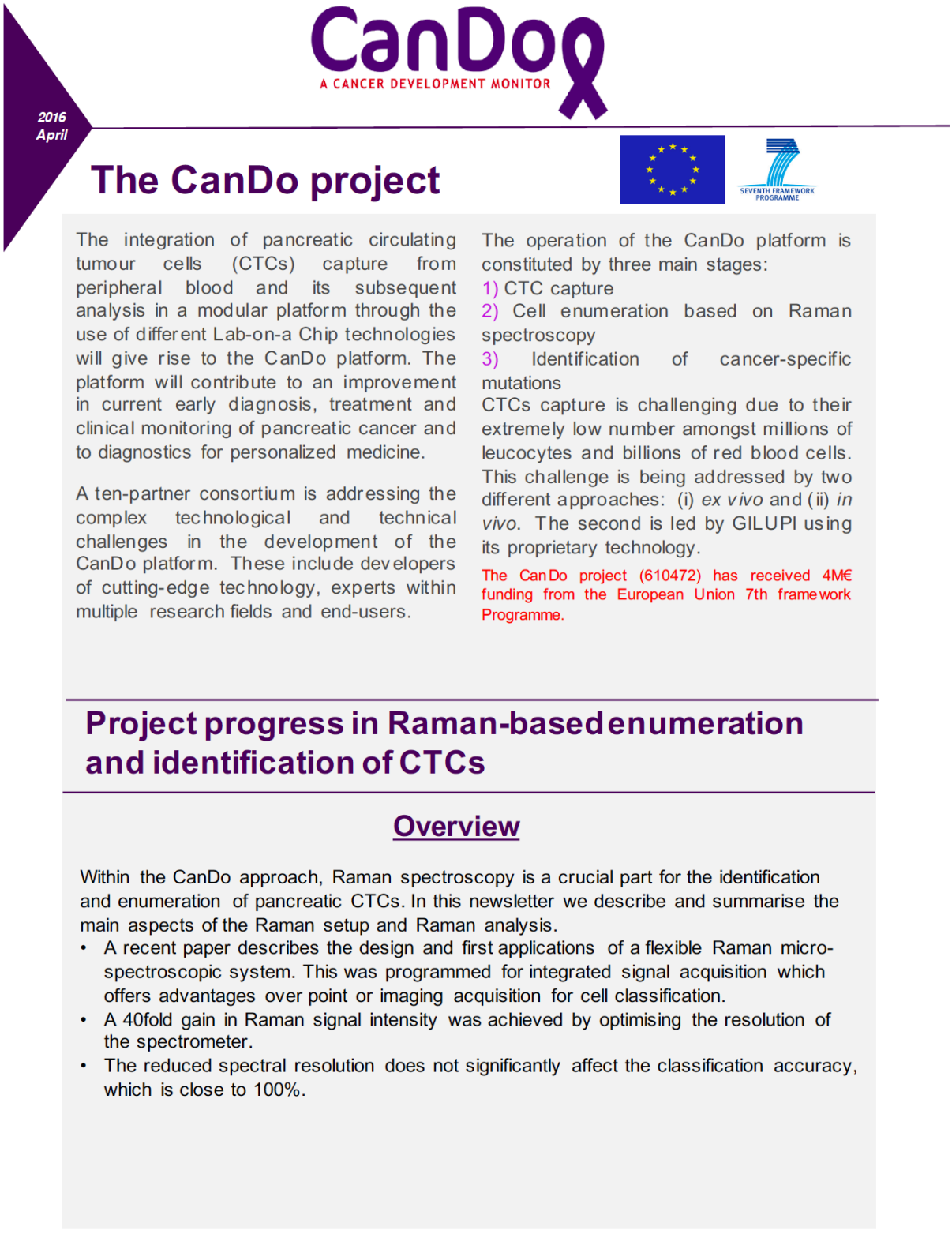
The channels chosen to publicise the project and its recent advances are the following:

- Newsletter: electronically distributed to de CanDo Interest Group. The content of the newsletter this time is related to the advances of the project in the enumeration and identification of CTCs by means of Raman scattering. The newsletter will be sent electronically to the >150 CanDo Interest Group partners.
- Flyer: The flyer also includes a more lengthy introduction to the project as well its achievements to date with a brief feature on the Gilupi Cellcollector®. A batch will be professionally printed for distribution at appropriate events (conferences, EC meetings, open days etc).
- Poster: it is being used by the partners where possible for general dissemination of the project.
- Short presentation: it is being used by the partners where possible for general dissemination of the project.

All this material is downloadable by the general public via the CanDo website: http://www.fp7cando.eu

4.2 Updated promotional material

4.2.1 Newsletter



2016
April

CanDo
A CANCER DEVELOPMENT MONITOR

The CanDo project

The integration of pancreatic circulating tumour cells (CTCs) capture from peripheral blood and its subsequent analysis in a modular platform through the use of different Lab-on-a Chip technologies will give rise to the CanDo platform. The platform will contribute to an improvement in current early diagnosis, treatment and clinical monitoring of pancreatic cancer and to diagnostics for personalized medicine.

A ten-partner consortium is addressing the complex technological and technical challenges in the development of the CanDo platform. These include developers of cutting-edge technology, experts within multiple research fields and end-users.

The operation of the CanDo platform is constituted by three main stages:
1) CTC capture
2) Cell enumeration based on Raman spectroscopy
3) Identification of cancer-specific mutations

CTCs capture is challenging due to their extremely low number amongst millions of leucocytes and billions of red blood cells. This challenge is being addressed by two different approaches: (i) *ex vivo* and (ii) *in vivo*. The second is led by GILUPI using its proprietary technology.

The CanDo project (610472) has received 4M€ funding from the European Union 7th framework Programme.

Project progress in Raman-based enumeration and identification of CTCs

Overview

Within the CanDo approach, Raman spectroscopy is a crucial part for the identification and enumeration of pancreatic CTCs. In this newsletter we describe and summarise the main aspects of the Raman setup and Raman analysis.

- A recent paper describes the design and first applications of a flexible Raman micro-spectroscopic system. This was programmed for integrated signal acquisition which offers advantages over point or imaging acquisition for cell classification.
- A 40fold gain in Raman signal intensity was achieved by optimising the resolution of the spectrometer.
- The reduced spectral resolution does not significantly affect the classification accuracy, which is close to 100%.

CanDo consortium

2

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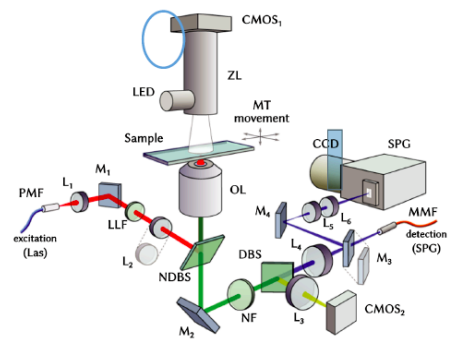
The CanDo project

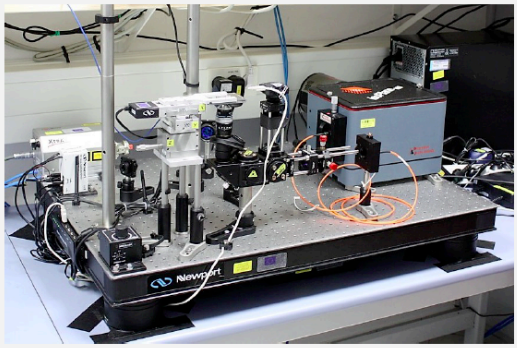
Optical layout and experimental realisation

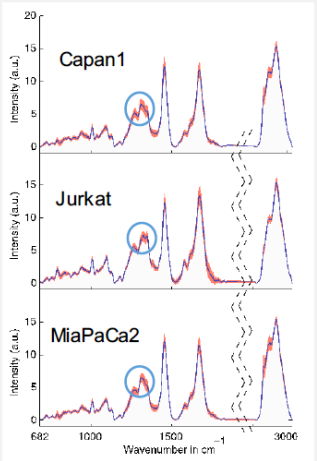


Optical setup consisting of:

- Transparent substrate with the blood from the patient (Sample), mounted in a computer controlled xyz plate
- Upper CCD camera to illuminate the region and localised the cells
- Optical setup consisting of a laser and several mirrors, filters (edge, neutral, plama), beam splitters, collimators, etc.
- Spectrometer with a CCD camera for detection

- A detailed list of the setup can be found*.
- The microscope can be operated in upright or inverted mode.
- Cylindrical or Powell lenses at position L2 (above) enable Raman line imaging.
- Beside the Raman mode, fluorescence detection can be implemented by an appropriate light source (replacing LED), filters and detector (replacing $CMOS_2$).





Integrated signal acquisition

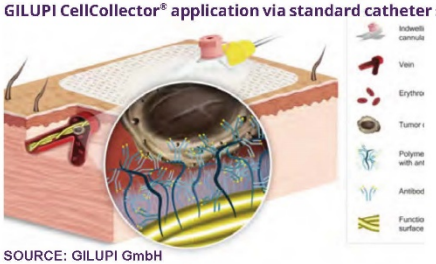
- The laser focus is moved over the cell during acquisition of a mean spectrum.
- Integrated signal acquisition is much faster than image acquisition.
- Such an integrated spectrum reduces the variations between cells and gives more robust classification models.
- The prominent feature in the circle distinguishes between pancreatic and non-pancreatic cells.

* R. Kiselev, I. W. Schie, S. Aškrabić, C. Krafft, J. Popp, Biomed. Spectrosc. & Imaging **5** (2016) 115-127.

4.2.2 Flyer

CTC capture *in vivo*

GILUPI CellCollector® application via standard catheter system



SOURCE: GILUPI GmbH

One of the technologies employed in the CanDo platform for capture of CTCs is the in vivo GILUPI CellCollector®.

The GILUPI CellCollector® is based on the fact that the largest group of cancers is of epithelial origin. Cells spread from these tumors express epithelial cell surface markers like the epithelial cell adhesion molecule, EpCAM. During the in vivo application, the functionalized surface comes into direct contact with the circulating blood and CTCs are bound to the device.

GILUPI CellCollector® application in pancreatic cancer patients has just started.

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CanDo - A Cancer Development Monitor
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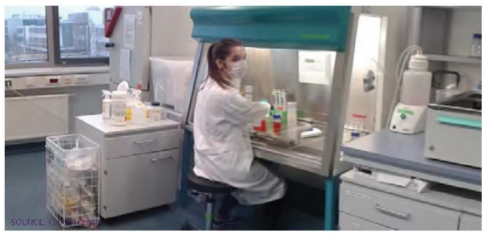

A step forward in monitoring pancreatic cancer

The research leading to these results has received 4M € funding from the European Community's seventh framework programme

ICMUV INSTITUT DE CIÈNCIA DELS MATERIALS de la Universitat de València · KAROLINSKA Karolinska Institutet · BAYER · IK4 IKERLAN · KTH VETENSKAP OCH KONST · Stockholms universitet · microfluidic ChipShop · LEIBNIZ-INSTITUT für PHOTONISCHE TECHNOLOGIEN ipht jena · imec · GILUPI NANOMEDIZIN

Biosensing platform

SOURCE: IK4-Ikerlan

Integrated microfluidics

"Sample in/answer out" diagnostic device

The objective of the CanDo project is to develop a biosensing platform based on the capture of circulating tumor cells (CTCs) from the peripheral blood for subsequent enumeration and molecular characterization.

The use of CTC technology give rise to five important improvements that were not available before. These are:

1) Early diagnosis and pre-operative profiling or profiling before chemotherapy
2) Evaluation of the surgical and/or chemotherapy treatment
3) Long term follow up, recurrence detection/ prediction
4) Profiling of resistant tumor cells when therapy fails
5) Perform next generation sequencing (NGS) on CTCs in the mid-term

In addition, resistant tumor cells can be isolated for research on drug resistance mechanisms and support development of new drugs.

CTC capture & enumeration

CTC capture from whole blood

CTC enumeration based on Raman spectroscopy

The platform contains two cartridges with modular components of microfluidic adaptations to different techniques for CTC enumeration and molecular characterization, i.e., different on Lab-on-a-Chip technologies.

Current CTC diagnostic and monitoring limitations will be overcome through the use of technologies that include a cell capture system that has already been proven and various micro-bio and bio-photonic systems, that have reached maturity from previous projects.

The operation of the CanDo platform is constituted by three main stages:

1) CTC capture
2) Cell enumeration based on Raman spectroscopy
3) Molecular analysis

Molecular analysis

Identification of cancer-specific mutations

Mutation detection by Photonic Ring Resonators

For the cancer relevant mutations the status of oncogenic mutations is obtained by Rolling Circle Amplification (RCA) of target padlock probes. The assays will be combined with a highly sensitive and simple detection system. This Photonic Ring Resonators system will allow an ultra-sensitive multiplexed biomolecule recognition.

"CanDo from a clinical perspective is more than just elegant!"

Professor Dr. Matthias Löhr, Karolinska Institute
iInternational expert in pancreatic cancer research and treatment

A step forward in monitoring pancreatic cancer

4.2.3 Poster

This has remained the same except for the the logo being substituted for the new one as can be seen in a poster based upon it for World Pancreatic Cancer Day (November 2014)

4.2.4 Short presentation

This has remained the same except for the logo being substituted for the new one.

5 Conclusions

Promotional material has been updated for disseminating the project and will continued to be updated periodically.