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BETTER GENITOURINARY CANCER DIAGNOSIS

KEYWORDS

- Monitor and diagnose
- Genitourinary cancers
- Photonic biosensors
- Laser microring

Collaboration type
License agreement
R&D collaboration

IP status
"SELF-REFERENCED SENSOR"
PCT/EP2020/061820
Priority Date:
30/04/2019

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THE TECHNOLOGY IN A NUTSHELL

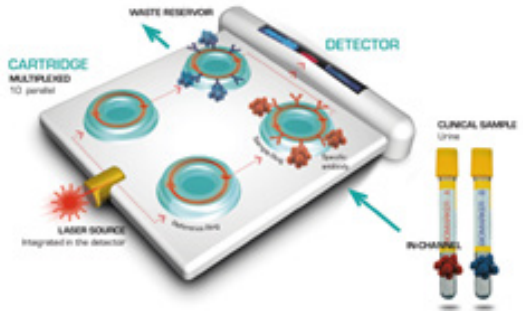
GLAM is an innovative device for personalized diagnosis and therapy monitoring for genitourinary cancers.

STATE OF THE ART

Currently, differential cancer diagnosis takes place daily in clinical settings for both patient stratification and monitoring patient responses to existing treatments.
However, the outcome of this diagnosis today is still poor, with many deficiencies and false positives and negatives due to the low sensitivity and specificity of available methodologies.
Moreover, as new targeted therapies are available to patients and to oncologists there is a huge need to improve personalised diagnosis and therapy.

THE INVENTION

GLAM develops an integrated device based on novel label-free photonic biosensors with ultra-sensitivity, simplicity of use, portability, multiplexing and low cost.
GLAM capitalizes on the unprecedented sensitivity achieved using laser microring resonators to detect key biomarkers in tumor development and treatment.
The GLAM device is a new diagnostic tool to detect biomarkers from biofluids, obtained in a non-invasive manner, specifically in urine and focusing on genitourinary cancers, enabling oncologists to take better treatment decisions.



KEY ADVANTAGES OF THE TECHNOLOGY

- Miniaturised, ultra-sensitive, robust, reliable, fast, and cost-effective device, capable of multiplexed biomarker level determination
- Use of urine as the biological material
- Use of cheap, environmentally friendly, disposable cartridges
- Rapidity to read the samples through the laser application

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TECHNOLOGY READINESS LEVEL 1 2 3 4 **5** 6 7 8 9

> GLAM consortium already designed and generated the first prototypes of microring structures

> Antibodies have already been functionalised to the new microring structures

> Patient recruitment has started to collect urine samples

> Preliminary preclinical proof of principle with a soluble biomarkers (10) and its corresponding detecting antibody.

> Several aspects related to technical documentations are already implemented by all the consortium partners which will serve as the regulatory basis for the CE Certification and ISO 13485

POTENTIAL APPLICATIONS

GLAM project develops a device to monitor and diagnose genitourinary cancers in a personalised way, rapidly, and at low cost.

THE TEAM

GLAM is a European research project coordinated by Leitat and involved 9 other partners from 6 different EU countries: the Institute for Bioengineering of Catalonia (IBEC) and the Institute of Photonic Sciences (ICFO) in Spain, the University of Twente and Radboud University Medical Center in the Netherlands, WizSoft in Israel, the Université Libre de Bruxelles (ULB) and Obelis S.A. in Belgium, Novelic in Serbia, and Optocap in the UK.

THE INVENTORS

Gregory Kozyreff graduated as a physics engineer in 1997 at ULB. In 2001, he obtained a PhD with a thesis on nonlinear laser dynamics. From 2001 to 2004, he was as a post-doc at the Oxford Centre for Industrial and Applied Mathematics (OCIAM), where he worked on a variety of mechanics and fluid problems in relation to the industry. From 2004 to 2008, he was a F.R.S-FNRS postdoctoral researcher and spent a year at ICFO-The Institute for Photonics Sciences, in Barcelona, working on nonlinear optics with whispering gallery mdoe resonators and photovoltaics. Since then, he has maintained a strong research activity in photonics, with special emphasis on the underlying fundamental physical questions.

Gregory Kozyreff and Postdoctoral Researcher **Nirmalendu Acharyya**, now based at the Indian Institute of Technology, Bhubaneswar, developped the theory and concepts on which the GLAM device is based.

RELEVANT PUBLICATIONS

Scientific publications:

> Al 2 O 3: Yb 3+ integrated microdisk laser label-free biosensor. De Goede, Michiel, et al. Optics letters 44.24 (2019): 5937-5940.

> Portable microresonator-based label-free detector: monotonous resonance splitting with particle adsorption. Acharyya, Nirmalendu, Mohamed Maher, and Gregory Kozyreff. Optics express 27.24 (2019): 34997-35011.

Press releases:

> Video: GLAM: Better Genitourinary Cancer Diagnosis

> The European project GLAM develops a multiplexed biosensor for personalized diagnosis and therapy for bladder cancers.

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