

GALAHAD fact sheet

Glaucoma – Advanced, LAbel-free High resolution Automated OCT Diagnostics

Acronym: GALAHAD

Summary

GALAHAD is a project funded by the EC through Horizon 2020. Its primary objective is to improve screening and basic diagnostics for glaucoma, which is a major cause of blindness throughout the world. The project will develop the potential of optical coherence tomography (OCT) which offers doctors a non-contact method of examining the surface and sub-surface of the retina (the light-sensitive tissue at the back of the eye) in real time without the need for anaesthetic.

Objective

The project GALAHAD targets the critical need for better glaucoma diagnostic systems. Glaucoma is an age-related major cause of blindness. The eye disease is characterized by an irreversible damage to the optic nerve head caused by increased intra-ocular pressure. The current screening and basic diagnostics for the disease involve intra-ocular pressure measurement, visual field tests and detection of structural damage to the optic nerve head and retinal nerve fibre layer. The present methods have high rates of false positive or false negative results since the in depth analysis of optical nerve head damage is not possible due to the poor resolution of available optical technologies. A leading candidate solution is optical coherence tomography (OCT), but the required axial resolution is $\sim 1 \mu\text{m}$, well beyond the 3-5 μm resolution of commercial systems.

GALAHAD aims to develop a label free, compact and easy to operate high resolution diagnostic OCT system. The multiband and multimodal system will use sub-micron ultra-high resolution polarisation sensitive OCT (UHR PS OCT).

The key breakthrough elements are:

- (i) A revolutionary low cost multiband supercontinuum light source.
- (ii) Ground-breaking ultra-broadband photonic components required to exploit such a source.
- (iii) Automated glaucoma screening algorithms: using end user evaluation of cell and animal models and tissue samples, automated algorithms will be developed, trained and tested so that non-expert operators will be able to perform glaucoma screening.

The GALAHAD in depth glaucoma diagnostics after a positive screening with conventional methods will dramatically reduce false positive and false negative screening results and decrease the number of patients suffering from glaucoma-related disability. The project is driven by world leading companies and manufacturers of OCT systems and guided by requirement specifications and validated by high ranking clinical and experimental ophthalmologists in their clinical settings.

Partners

1	Gooch & Housego (Torquay) Limited	UK
2	Optos PLC	UK
3	NKT Photonics A/S	Denmark
4	Ibsen Photonics AS	Denmark
5	Vivid Components Ltd	UK
6	Danmarks Tekniske Universitet	Denmark
7	Universitat Politecnica De Valencia	Spain
8	Gloucestershire Hospitals NHS Foundation Trust	UK
9	Westfälische Wilhelms-Universität Münster	Germany
10	Region Hovedstaden	Denmark

Project details

Project reference:	732613
Start date	01-Dec-2016
End date	30-Nov-2019
Duration	36 months
Website	www.galahad-project.eu
Status:	Execution
Project cost:	EUR 3,996,780
EU contribution:	EUR 3,996,780 (100% funded)
Programme acronym:	Horizon 2020

Pillar	Industrial Leadership
Work Programme Year	H2020-2016-2017
Work Programme Part	Information and Communication Technologies
Call	H2020-ICT-2016-2017

Type of action: Research and Innovation action (RIA)

The project is through the Photonics and Factories of the Future (FoF) Public Private Partnerships (PPP).



PHOTONICS PUBLIC PRIVATE PARTNERSHIP

