Preceyes validates real-time distance measurement for retinal surgeries in world's first clinical validation at Rotterdam Eye Hospital

Eindhoven, 21 February 2018 – Preceyes B.V. (Eindhoven, the Netherlands) and partners developed and integrated a distance sensor in Preceyes' robot. The sensor measures the distance of an instrument to the retina in real time. The integrated device has been successfully used in a world's first clinical validation at Rotterdam Eye Hospital (Rotterdam, the Netherlands). Providing sensor-based safety and guidance, the robot-sensor combination promises significant safety and performance benefits for retinal surgery. Moreover, the sensor will be a source of data for training and evaluation.

Retinal surgeries are performed by a small group of highly specialized ophthalmologists working at the physical limits of their motion and vision skills. The newly developed sensor supports these surgeons with real-time, micrometer depth perception using technology from optical coherence tomography (OCT). Distance measurements are fed back via audio signals, much like a car's parking sensor. Exploiting the micrometer precision of the robot, the sensor allows the surgeon to comfortably maintain a fixed distance to the retina. This promises to reduce accidental tissue damage and improve retinal surgeries.

The study has been the world's first clinical validation of the sensor, with financial support of the European Union and the Netherlands Organization for Scientific Research. The robot-sensor combination has been successfully used in five patients. With the sensor, repetitive surgical routines can be automated. This promises to reduce surgeon burden and to decrease surgery time, making the robot-sensor combination attractive to high-volume usage in general hospitals.

Preceyes developed the sensor with consortium partners within the European Horizon 2020 project EurEyeCase: Medical Laser Center Lübeck (DE), Eindhoven University of Technology (NL) and the Austrian Center for Medical Innovation and Technology (AT). Surgeons of Rotterdam Eye Hospital and Sacco Hospital Eye Clinic (IT) performed the surgeries in Rotterdam. The study is the start of a multi-year collaboration between Preceyes and Rotterdam Eye Hospital for the development of robotic surgery.

Koorosh Faridpooya MD, senior retinal surgeon and lead investigator at Rotterdam Eye Hospital, said: "The Preceyes robot brings vitreoretinal surgery to the next level by maximizing the surgeon's precision and control. Using this revolutionary sensor in the eye enables us to operate with enhanced vision and it supports the surgeon to improve surgery."

Matteo Cereda MD, senior retinal surgeon at Sacco Hospital Eye Clinic, commented: "Using the robot definitely makes me a better surgeon. I felt really safe using it and all movements of the surgeon become really precise. In combination with the sensor, accidental trauma to the retina can now be avoided. A robot with this sensor paves the way to new scenarios in eye surgery and new therapeutic approaches."

Prof. Marc de Smet MD, CMO of Preceyes, said: "This sensor represents a highly significant milestone. It promises to enhance the surgical skills of retinal surgeons at all levels of training and experience. The robot-sensor combination promises to improve the safety, the outcomes and speed of everyday surgical procedures. Analysis of the data generated and stored during surgery will allow us to optimize surgical steps by providing training and evaluating surgical performance."

Further information

Preceyes, Gerrit Naus, CEO Preceyes, gerritnaus@preceyes.nl, +31 (0)40 247 4789
Eye Hospital Rotterdam, Robert Spiering, r.spiering@oogziekenhuis.nl, +31 (0)6 23753275

About Preceyes
Preceyes B.V. is a medical robotics company focused on ocular surgery in the eye care market. The company develops, builds and commercializes innovative robotic solutions to assist eye surgeons in performing the most demanding surgical tasks. The company's first target is vitreoretinal surgery. The robot supports the surgeon in improving existing surgery and enables the development of new, high-precision treatments. Preceyes is a spin-out of the Eindhoven University of Technology and is located at the TU/e Science Park in Eindhoven, the Netherlands. Preceyes leverages the mechatronics capability of the Dutch Brainport region. www.preceyes.nl

About the Rotterdam Eye Hospital
The Rotterdam Eye Hospital serves as a top institute for ophthalmic care. Every year, more than 12,500 surgeries are performed in the hospital and 139,000 outpatient clinic visits take place. The Rotterdam Eye Hospital is founder and member of the World Association of Eye Hospitals, a worldwide association of specialist ophthalmic centers. www.oogziekenhuis.nl

About the Sacco Hospital Eye Clinic, Università degli Studi di Milano
The Eye clinic is one of the top Italian department in the management of retina-related disorders. Every retinal sub-speciality has its own dedicated outpatient clinic. Every day more than 100 patients are visited and many others medically or surgically treated. The center serves as a Principal Investigator or Co-investigator in many phase II/III Clinical Research Trial.

About the Medical Laser Center Lübeck
The Medical Laser Center is a non-profit company which operates in close cooperation with the University of Lübeck. Besides own activities in research and development, it serves as a technology transfer platform for optics and biophotonics. MLL is a pioneer in OCT with successful transfer of this technology to now three companies (Heidelberg Engineering GmbH, Thorlabs AG and Optomedical Technologies GmbH). MLL offers industrial partners applied R&D, clinical and preclinical studies with own prototypes or devices which conform to the Medical Device Directive. www.mll-luebeck.de

About the Eindhoven University of Technology
Eindhoven University of Technology (TU/e) is a leading international university specializing in engineering science & technology, contributing through excellent teaching and research to progress in the technical sciences, to the development of technological innovations and as a result to the growth of welfare and wellbeing, both within its own region (technology & innovation hotspot Eindhoven) and beyond. Our education, research and knowledge valorization contribute to science for society, science for industry and science for science. TU/e translates research results into innovative products and services, working closely with industry. www.tue.nl

About the Austrian Center for Medical Innovation and Technology
The "Austrian Center for Medical Innovation and Technology" (ACMIT) is a research and development

center in the field of medical technology. Our development process comprises all steps from concept phase to the development and manufacturing of prototypes, including their clinical testing until release for mass production. Within the framework of the Austrian COMET program, ACMIT is supported by public funding. www.acmit.at

About the funding

The EU Framework Programme for Research and Innovation Horizon 2020 (Grant No. 645331, www.eureyecase.eu), the Coolsingel Foundation (www.stichtingcoolsingel.nl) and the Netherlands Organisation for Scientific Research (www.nwo.nl/en) have financially contributed to enable the robotic study and the sensor development.