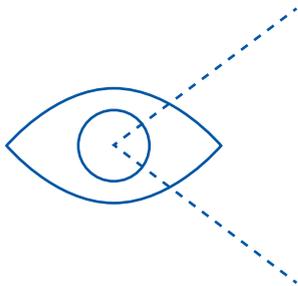


# ICTER

## *Revolution in the diagnostics and treatment of eye diseases*

The Center is implementing the project called: “International Centre for translational Eye Research” (ICTER). The research will develop groundbreaking instruments for retinal cell imaging. These devices will be used to test new therapies for, among others, patients with diabetic retinopathy, which is the leading cause of vision loss in productive-age individuals, or with age-related macular degeneration (AMD) – the most common cause of blindness among people aged over 50 in developed countries.



The International Centre for Translational Eye Research



Prof. Maciej Wojtkowski, Dsc. Hab., and Prof. Krzysztof Palczewski, Dsc. Hab.



Vision science, optical imaging, ophthalmic diagnostics, pharmacology of retinal diseases, medical instrumentation, drug delivery



Research on human eye dynamics and plasticity, and the development of new therapies and diagnostic tools to help treat and diagnose a range of vision dysfunctions

*Vision is a complicated multi-stage process, and while we already know very much about it, the exact course of many retinal diseases remains a mystery. In order to get closer to solving this mystery, it is necessary to develop more precise methods for retinal microstructure visualisation in patients. We need to learn more details at the cellular level. From among several thousands of cells, our aim is to identify a single cell and obtain its high-resolution image –* **Professor Maciej Wojtkowski.**

*Our tools will allow the assessment of not only the structure of the individual layers of the retina, but also their function. This will play a critical role in choosing the right pharmacotherapeutic solutions for degenerative changes in the retina and other retinal pathologies. Also, we will be able to monitor changes in the eye in response to pharmacotherapy or surgical procedures, or age-related changes –* **Professor Maciej Wojtkowski.**



Quotes





**Prof. Maciej Wojtkowski, Dsc. Hab.** – he started his research career at the Nicolaus Copernicus University in Toruń, where he earned his Master's degree, and later doctoral degree and habilitation (at the Institute of Physics, Faculty of Physics, Astronomy and Informatics). He was a research fellow at the University of Vienna in Austria and the Massachusetts Institute of Technology in Cambridge, USA. Prof. Wojtkowski heads the Department of Physical Chemistry of Biological Systems at the Institute of Physical Chemistry of the Polish Academy of Sciences in Warsaw. Professor Wojtkowski has authored more than 160 research publications and dozen-odd patents and patent applications. He has designed the tomography scanner used for the non-invasive and contactless examination of the inside of the eye, for which he received the Foundation for Polish Science Award in the field of mathematical, physical and engineering sciences. The scanner prototypes developed by Professor Wojtkowski became a blueprint for many devices currently used in ophthalmology clinics across the world.

**Prof. Krzysztof Palczewski, Dsc. Hab.** – he earned his Master's degree in Chemistry at the University of Wrocław, and his doctoral degree at the Wrocław University of Technology. He is an internationally renowned authority on the biochemistry of vision. Professor Palczewski worked at the University of Florida in Gainesville, USA, and the Oregon Health Sciences University in Portland, USA, where he established his own laboratory. He spent 13 years as a researcher at the University of Washington in Seattle, USA, where he also served in managerial roles. Professor Palczewski was the head of the Department of Pharmacology at the Case Western Reserve University in Cleveland, USA. He is currently employed with the University of California Medical School in Irvine, USA. His most notable accomplishments include the crystallisation and description of rhodopsin structure and function, and the discovery of the mechanisms underlying retinal degeneration and the associated loss of vision, for which he received the Foundation for Polish Science Award in the field of life and Earth sciences. Prof. Palczewski is a foreign member of the Polish Academy of Learning.



### Interesting facts

Professor Krzysztof Palczewski, one of the founders of ICTER center of excellence, was able to restore vision in animals with the same mutations as those found in patients suffering from retinitis pigmentosa and other congenital mutations leading to blindness. Blindness reversal could be achieved through the simultaneous intervention in several stages of the vision cycle.

Professor Maciej Wojtkowski, one of the founders of ICTER, has invented the advanced spectral optical coherence tomography (SOCT) scanner for retinal imaging – a device which could provide eye images of much superior quality compared to its predecessors. The SOCT scanner has revolutionised ophthalmological examinations and is currently used by ophthalmologists across the world. According to the Ministry of the Economy, the SOCT scanner is one of the three, alongside graphene and infrared photodetectors, “Polish photonic products to have achieved a world-class level and global commercial success”.



International partners:

UCL Institute of Ophthalmology - IoO, London, UK

UC Irvine's Gavin Herbert Eye Institute, California, USA

Research partner from Poland:

Institute of Physical Chemistry, Polish Academy of Sciences



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