



The **CREA**tion of the Department of Physical Chemistry of Biological Sys**TE**ms [CREATE] 666295 — CREATE — H2020-WIDESPREAD-2014-2015/H2020-WIDESPREAD-2014-2

# Report on the CREATE 3<sup>rd</sup> SCIENTIFIC SYMPOSIUM

Level of dissemination: PUBLIC

Warsaw, February 2021



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#### CREATE 3<sup>rd</sup> SCIENTIFIC SYMPOSIUM

On February 24, 2021, the 3<sup>rd</sup> CREATE Scientific Symposium entitled "*Physical Chemistry in biological systems – breaking barriers: Workshop on Advances in eye research"* was organized. Due to the pandemic, the symposium was held online via the Microsoft Teams platform.

The programme of the symposium highlighted the latest trends in research on function, disease ethology, therapeutics and imaging of the human eye. The meeting aimed to understand the current state of knowledge about vision processes and the factors responsible for degenerative retinal diseases and diseases of the eye's anterior segment. It was expected that by confronting specialists' experiences in the fields of eye research and researchers working on the development of new imaging technologies, it would be possible to determine the most optimal directions and accelerate the process of bringing knowledge to the diagnosis and treatment of eye diseases.



The programme of the CREATE 3<sup>rd</sup> Scientific Symposium covered one day. The whole IPC PAS research society was invited to participate in this event. The symposium consisted of invited talks of prominent international speakers from one of Europe's most prominent organization dedicated to eye research – UCL Institute of Ophthalmology. [For the full programme of the CREATE 3<sup>rd</sup> Scientific Symposium see Annex 1.]

The first talk entitled "*Eve research at IPC PAS*" was delivered by Prof. Maciej Wojtkowski, ERA Chair Holder. In his speech, Prof. Wojtkowski pointed out the main goals of the CREATE project, such as introducing a new research area to the IPC PAS and creation of the new department. Then he briefly summarized the last five years of his scientific activity in IPC PAS: he discussed the core competence of the Physical Optics and Biophotonics Group (POB) which is in vivo and noninvasive imaging of comlex living systems.

In the next part of his talk, Prof. Wojtkowski introduced the IPC PAS community to the agenda of the newly established International Centre for Translational Eye Research. This part's main objective was to encourage researchers from the IPC PAS dealing with various areas to broader and more intensive cooperation in the framework of research conducted by Prof. Wojtkowski.







The talk delivered by prof. Maciej Wojtkowski within CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

The following part was dedicated to the invited talks of the researchers from the University College London, the experts in the fields of eye research who are working on the development of new imaging technologies:

Prof. John Greenwood delivered a seminar entitled <u>"LRG1: A novel therapeutic target in</u> <u>retinal vascular disease"</u>. Prof. Greenwood is the Hugh Davson Professor of Biomedical Research and Head of the Department of Cell Biology at the UCL Institute of Ophthalmology, University College London. His research focuses on identifying and studying novel drivers of vascular pathology in the retina and, in particular, factors that contribute to the development of pathogenic neovascularisation and vessel remodelling.







The seminar delivered by prof. John Greenwood, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

Prof. Matteo Carandini delivered a seminar entitled <u>"Looking at the eye from the brain"</u>. Prof. Carandini is a neuroscientist who studies the visual system. The main aim of his research is to understand how the brain makes decisions based on information from the senses (typically, vision) and from past experience (learning a task, learning the value of a choice).



The seminar delivered by prof. Matteo Carandini, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

Prof. Mike Cheetham delivered a seminar entitled <u>"Eye in the dish, using 3D retinal organoids</u> <u>to understand inherited retinal dystrophies</u>". Prof. Cheetham is a Professor of Molecular and Cell Biology at the UCL Institute of Ophthalmology. The main aim of his research is to understand why nerves die in the retina, the spinal cord and the brain.







The seminar delivered by prof. Mike Cheetham, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

Prof. Andrew Stockman delivered a seminar entitled <u>"The effects of molecular loss on visual performance reveals key details about normal and abnormal visual processing</u>". Prof. Stockman is a Steers Professor of Investigative Eye Research at the UCL Institute of Ophthalmology. He has been an Honorary Consultant of Moorfields Eye Hospital since 2004.

OVERVIEW						
	Over the past 20 years we have measured the effects of rare genetic disorders on visual performance in collaboration with clinicians at Moorfields.					
	Here we present a reanalysis and a new model of visual processing that allows us to link the visual losses of patients to the underlying molecular or neural losses.					
By comparing patient and normal visual performance we can determine whether the patient losses are due to stages that have slowed down, sped up, and/or attenuated the visual response. We can then relate those changed stages to the expected effects of the gene defect.						
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The seminar delivered by prof. Andrew Stockman, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

Prof. Christiana Ruhrberg delivered a seminar entitled <u>"VEGF promotes axon guidance in the visual system</u>". Prof. Ruhrberg is a Professor of Neuronal and Vascular Biology at the UCL Institute of Ophthalmology. Her research focuses on understanding neuronal and vascular development and identifying molecular targets for therapeutic intervention in vascular disease.



The seminar delivered by prof. Christiana Ruhrberg, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

Prof. Pete Coffey delivered a seminar entitled <u>"Regenerating the diseased retinal pigment</u> <u>epithelial layer</u>". Prof. Coffey is a Professor of Visual Psychophysics at the UCL IoO. He is the world-leading eye researcher who pioneered a treatment, i.e. groundbreaking stem cell-based therapy, enabling people whose vision has been destroyed by disease to see again.



The seminar delivered by prof. Pete Coffey, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

Prof. Ted Garway-Heath delivered a seminar entitled <u>"Optimizing psychophysical test for</u> <u>qlaucoma diagnosis and monitoring</u>". Prof. Garway-Heath is an International Glaucoma Association Professor for Glaucoma and Allied Studies at the UCL Institute of Ophthalmology and Consultant Ophthalmic Surgeon at Moorfields Eye Hospital. His research interests include





development and evaluation of techniques for effective diagnosis, monitoring and management of glaucoma.



The seminar delivered by prof. Ted Garway-Heath, CREATE 3<sup>rd</sup> Scientific Symposium February 24, 2021

The whole lectures met with great interest of the audience, as evidenced by the large number of questions and comments. The CREATE 3<sup>rd</sup> Scientific Symposium was attended by ca. 80 people.

This event was a summary of 5 years' service of the ERA Chair – Prof. Maciej Wojtkowski, whose main goal was to introduce the research excellence and new research area to the Institute of Physical Chemistry PAS. The culmination of ERA Chair's activities was to win funding for the initiative of establishing a centre of excellence that focuses on eye research, a shared division with UCL Institute of Ophthalmology and cooperation with Prof. Krzysztof Palczewski from University of California, Irvine.

The lectures by invited excellent guests from the field of eye research were part of the introduction of scientific excellence at the Institute, giving a broader view of the new field introduced to the Institute through the CREATE project.





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ANNEX 1.

Full agenda







## Physical Chemistry in biological systems - breaking barriers: Workshop on Advances in eye research

#### Agenda

		B	<b></b>
Time ECT	GMT	Presenters	litle
14:00	13:00	Andrew Dick / Maciej Wojtkowski	Welcome - IoO & IPC PAS 5 mins talk each
14:10	13:10	Maciej Wojtkowski	Eye research at IPC PAS
15:00	14:00	5 min questions	
15:05	14:05	John Greenwood	LRG1: A novel therapeutic target in retinal vascular disease
15:20	14:20	5 min questions	
15:25	14:25	Matteo Carandini	Looking at the eye from the brain
15:40	14:40	5 min questions	
15:45	14:45	Mike Cheetham	Eye in the dish, using 3D retinal organoids to understand inherited retinal dystrophies
16:00	15:00	5 min questions	
16:05	15:05	10 min break	
16:15	15:15	Andrew Stockman	The effects of molecular loss on visual performance reveals key details about normal and abnormal visual processing
16:30	15:30	5 min questions	
16:35	15:35	Christiana Ruhrberg	VEGF promotes axon guidance in the visual system
16:50	15:50	5 min questions	
16:55	15:55	Pete Coffey	Regenerating the diseased retinal pigment epithelial layer
17:10	16:10	5 min questions	
17:15	16:15	Ted Garway-Heath	Optimizing psychophysical test for glaucoma diagnosis and monitoring
17:30	16:30	5 min questions	
17:35	16:35	Wrap up	



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