

東京大学 グローバル COE 『統合生命学』 特別セミナー  
21 世紀 COE 『脳神経医学の融合的研究拠点』 セミナー

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東京大学大学院 理学系研究科 生物化学専攻  
医学系研究科 神経機能解明ユニット

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演者：Dr. Robert Lucas

Professor of Neurobiology, Faculty of Life Sciences,  
University of Manchester, Manchester, UK

演題：The form and function of  
mammalian inner retinal photoreceptors

日時：平成 19 年 10 月 9 日 (火) 16:30~18:00

場所：東京大学理学部 3 号館 3 階 327 号室

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Among the most surprising recent discoveries in visual science has been that rods and cones are not the only cells in the mammalian retina capable of responding directly to light. Rather, a small number of the cells whose axons form the optic nerve (retinal ganglion cells) are intrinsically photosensitive and are able to signal information regarding the overall quantity of light in the environment (irradiance) to the brain. They attain this remarkable ability through expression of an opsin based photopigment called melanopsin. In this presentation I will review the discovery and characterisation of these photoreceptors, and continue to describe our ongoing attempts using transgenic mice and cell culture methods to investigate how they work, and the contribution that they make to mammalian photosensitivity.

References

Bellingham J, Chaurasia SS, Melyan Z, Liu C, Cameron MA, Tarttelin EE, Iuvone PM, Hankins MW, Tossini G, Lucas RJ (2006) Evolution of melanopsin photoreceptors: Discovery and characterization of a new melanopsin gene in non-mammalian vertebrates **PLoS Biology** 4(8):e254

Melyan Z, Tarttelin EE, Bellingham J, Lucas RJ, Hankins MW (2005). Addition of human melanopsin renders mammalian cells photoresponsive. **Nature** 433:741-5

Lucas RJ, Hattar S, Takao M, Berson DM, Foster RG, Yau K-W (2003) Diminished pupillary light reflex at high irradiances in melanopsin-knockout mice. **Science** 299:245-247.

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