



Public Health
England

Protecting and improving the nation's health

Light measurements in the melanopsin age

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Light, health and shift work, October 13th, 2016
BAuA, Dortmund, Germany

Light and Public Health

Public Health:

The science and art of promoting and protecting health and well-being, preventing ill-health and prolonging life through the organised efforts of society.

World Health Organization:

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

Light and Public Health

Recommendations for light exposure:

Vision

Other responses/effects

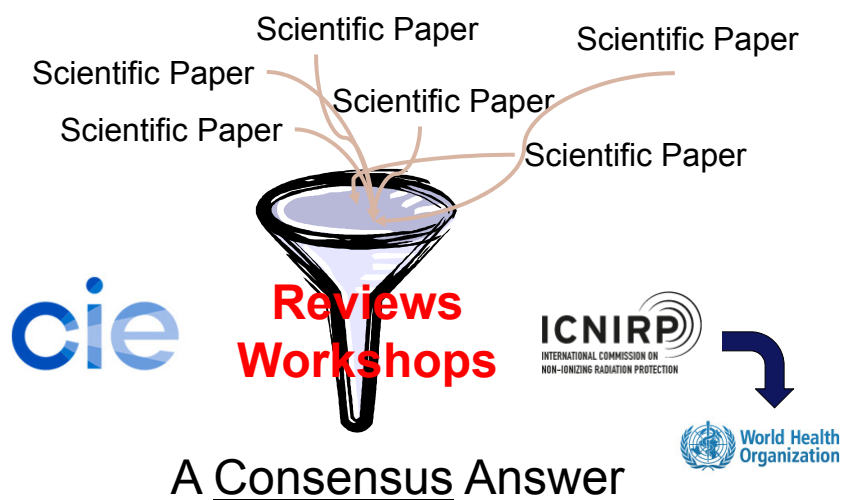
Evidence-based

Do more good than harm

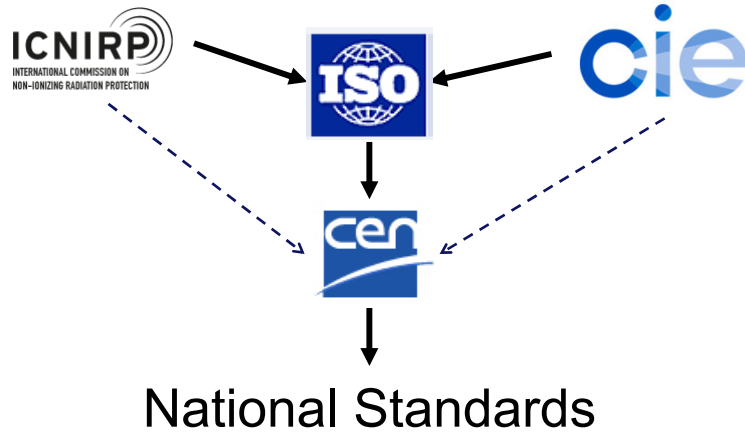
Appropriate to the individual (where possible)

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Evidence-based Advice

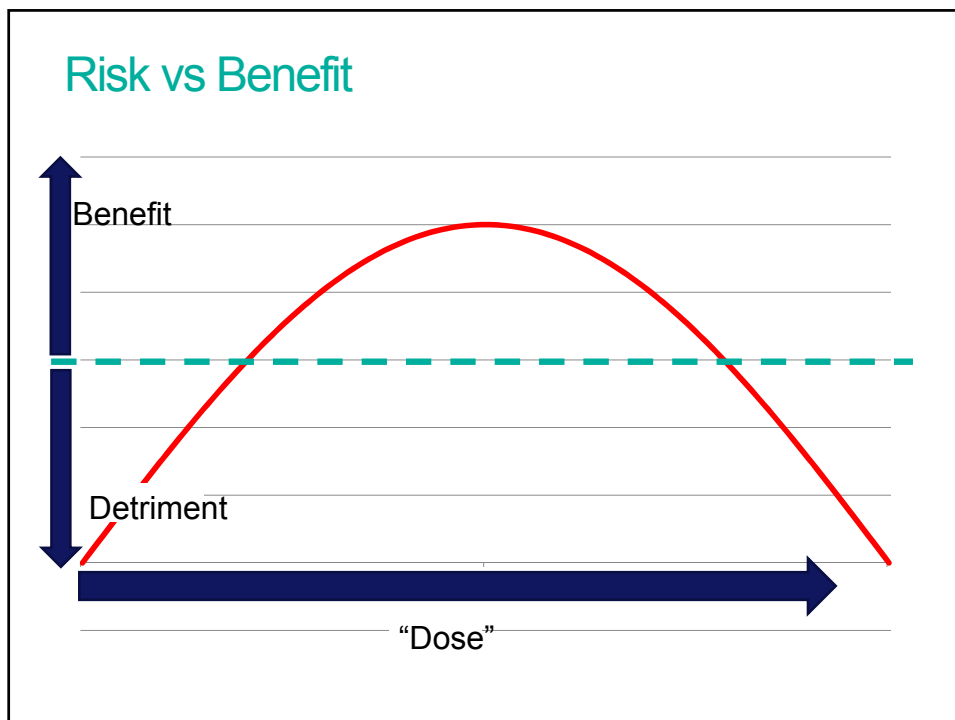


Standards' Process



Seasonally Affective Disorder





The First International Workshop on Circadian and Neurophysiological Photoreception, 2013



“Aim: Address the question of how melanopsin photoreceptors impact methods of measuring light by bringing key contributors together to compose a review article, which summarizes current areas of consensus and uncertainty and, to the extent that this is possible, provides advice for measuring light.”

Measuring and using light in the melanopsin age

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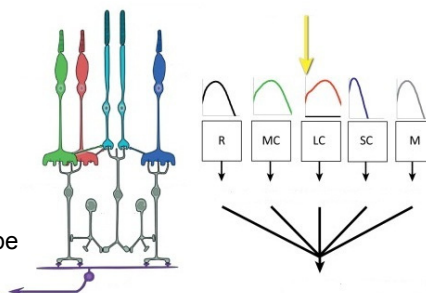
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Trends in Neurosciences January 2014, Vol. 37, No. 1

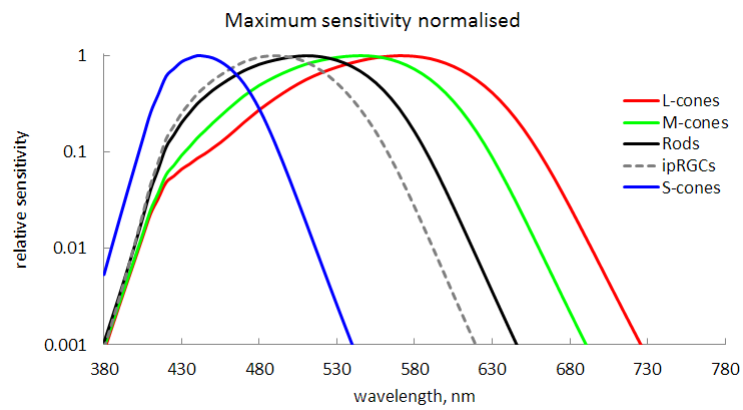
Photoreceptors

α is used to denote photoreceptor type



α	pigment	photoreceptor
lc	erythropic	long wavelength cones
mc	chloropic	medium wavelength cones
Z	melanopic	photosensitive retinal ganglion cells
r	rhodopic	rods
sc	cyanopic	short wavelength cones

Human sensitivity curves



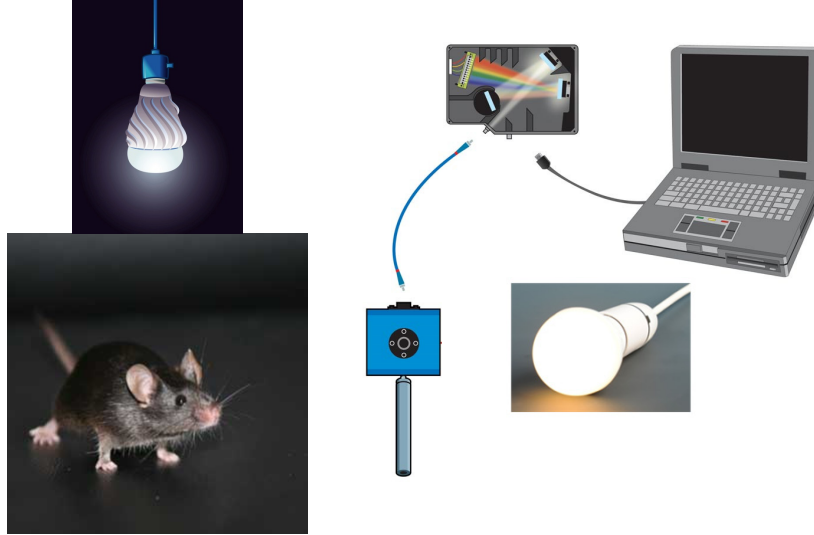
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Experimental Studies



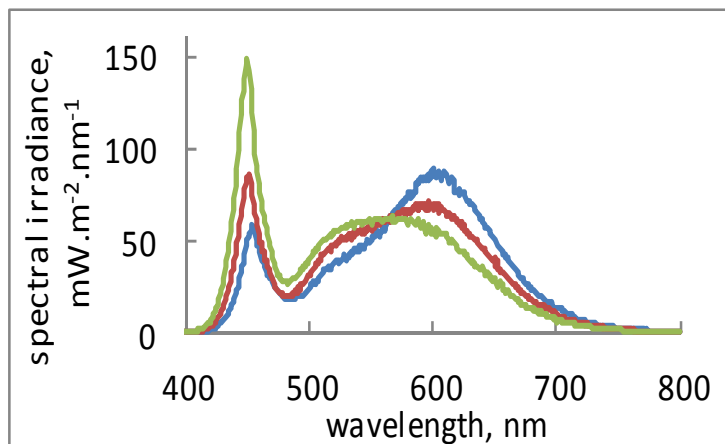
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Experimental Studies



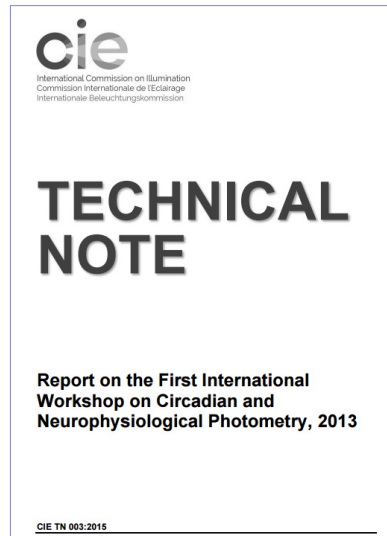
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Spectral Power Distribution



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International Commission on Illumination



and toolbox

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International Commission on Illumination

JTC 9 (D1/D2/D3/D6): Quantifying ocular radiation input for non-visual photoreceptor stimulation

To define action spectra and metrics in order to quantify the ocular radiation input to all photoreceptors possibly involved in non-visual responses. To provide a method to calculate from a measured spectral irradiance, ideally at the cornea surface, the stimulation of each photoreceptor that can potentially contribute to non-visual responses. To demonstrate the validity of such metrics for predicting physiological responses based on existing data in the literature.

Chair: Luc Schlangen (NL)

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CIE Research Strategy

Top Priority Topics

Recommendations for Healthful Lighting and Non-Visual Effects of Light

Support for Tailored Lighting Recommendations

Colour Quality of Light Sources Related to Perception and Preference

Integrated Glare Metric for Various Lighting Applications

New Calibration Sources and Illuminants for Photometry, Colorimetry, and Radiometry

Adaptive, Intelligent and Dynamic Lighting

Application of New CIE 2006 Colorimetry

Visual Appearance: Perception, Measurement and Metrics

Metrology for Advanced Photometric and Radiometric Devices

Reproduction and Measurement of 3D Objects


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CIE

Research Roadmap for Healthful Interior Lighting Applications

CIE 218:2016

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Public Health
England

Protecting and improving the nation's health

Thank You for Listening

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