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TECHNICAL NOTE

**What to document and report in studies
of ipRGC-influenced responses to light**

CIE TN 011:2020

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Summary

Interest in studying the ipRGC¹-influenced responses to light is strong, and continues to increase. The research teams who work in this domain come from many disciplines, each with their own research perspectives. Perhaps as a consequence, reviewers and readers of papers in this field are often frustrated by missing details in the reports, particularly in relation to the stimulus conditions – the light conditions to which people and animals are exposed. This impedes attempts to conduct systematic reviews that link stimulus and response and slows progress towards recommendations and standards. This document provides a concise template for reporting investigations of ipRGC-influenced responses to provide guidance to research teams from all fields. It builds upon the guidance for describing stimulus conditions described in publication CIE 213:2014 *Guide to Protocols for Describing Lighting*, but is specifically tailored for research in this aspect of applied lighting and for applying the CIE system of metrology for ipRGC-influenced responses to light described in CIE S 026:2018. The CIE makes this document freely available to encourage researchers, journal reviewers, and journal editors to follow this guidance, with the aim of enhancing the usefulness of this research for knowledge mobilization and application.

1 Introduction

The number of studies on effects of light exposure influenced by ipRGCs has substantially increased in the last decade. This is not surprising, as it is an exciting research topic and there are many gaps in our understanding (CIE 2016). The topic is complex, involving many variables influencing various physiological and psychological processes. The variables are environmental-, stimulus- and person-related. Environmental variables include date and time of day of measurements, location of study, setting, qualitative description of room surfaces, and other conditions such as air temperature and pressure. Stimulus variables include light intensity, spectral properties, timing and duration of exposure, and possibly the retinal irradiance pattern. Person variables include visual capabilities, chronotype, age, photosensitivity and light history. Furthermore, the effects of light exposure on people can be assessed by means of questionnaires, tests, tasks, behavioural observations, and physiological measures. Careful research design, and sometimes other dependent measures, are also needed to differentiate ipRGC-influenced responses from other parallel processes.

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A concise template or protocol for reporting investigations of ipRGC-influenced responses to light (IIL responses, as specified in CIE S 026 (CIE 2018)) would provide guidance to research teams from all fields about how to report their investigations in such a way as to enhance their usefulness for knowledge mobilization and application. This template builds upon the guidance for describing stimulus conditions described in publication CIE 213:2014 *Guide to Protocols for Describing Lighting* (CIE 2014), but is specifically tailored for research in this aspect of applied lighting, and upon the recommendations for reporting light exposures in CIE TN 003:2015 *Report on the First International Workshop on Circadian and Neurophysiological Photometry* (CIE 2015) and in CIE S 026:2018 *CIE System for Metrology of Optical Radiation for ipRGC-Influenced Responses to Light* (CIE 2018). The focus here is on interior applications, for which detailed guidance is provided; nonetheless, the general approach might also apply to light exposures occurring outdoors. Other documents that provide guidance for researchers in this field are the articles by Price et al. (2019) (providing general, high-level guidance aimed particularly at occupational health research), and Spitschan et al. (2019) (providing measurement guidance for accurate assessment of light exposures).

This Technical Note distinguishes between 'documentation', with the purpose of recording details of the research for future use and comprehensive archival records, and 'reporting', referring to the presentation of the research in a journal or a conference paper. This is reflected

¹ ipRGC: intrinsically photosensitive retinal ganglion cell