Research on the effects of differences in spectral distribution on the visual effectiveness of the elderly

Primary Researcher: Akari Kagimoto
Assistant Professor, Nara Women's University

The amount of photoreceptor cells in the retina that are stimulated is calculated as the integral of the spectral distribution of lighting and the spectral sensitivity of each photoreceptor cell. Therefore, different spectral distributions result in different color visibility and brightness perception. In recent years, the effects of melanopsin cells, which are retinal ganglion cells, on visual perception have been reported. However, studies have been conducted mainly on young subjects. Since the human eye changes with age, it is necessary to understand the age-related changes in visual perception induced by melanopsin cells. In this study, we investigated the visual perception given by melanopsin cells in terms of brightness perception and color perception in young and elderly subjects. The results showed that the perception of brightness varied with the amount of melanopsin stimulation in the young, but not in the elderly. The results also indicated that the perception of color may differ depending on the age of the subjects in an environment with a correlated color temperature of 5,000 K.