

## Joan E. Roberts, Ph.D.

### *Lighting and Human Health*

#### Speakers Profile

Joan E. Roberts, Ph.D. is a tenured professor of chemistry at Fordham University in the Department of Natural Sciences, New York. In addition to teaching Neuroscience, Organic Chemistry and Science in the Media, Dr. Roberts studies the positive and negative effects of light on the human eye. Positive effects of visible light received by the human eye include controlling circadian rhythm and treatment of seasonal depression. With her collaborators in New York Eye and Ear Infirmary and Brookhaven National Laboratories, New York; Milan, Italy; Shanghai, China; and the National Institute of Environmental Health Sciences in North Carolina, she studies how UV and blue visible light enhance the formation of cataracts and macular degeneration and studies ways of preventing these age related diseases.

In addition to over 105 publications in peer reviewed scientific journals, Dr. Roberts' work has been published in several prominent "lay journals" including Sky and Telescope, New Scientist, Eye World, Men's Health and on several medical websites, such as ABC News.com, Reuters and BBC News.com. Dr. Roberts has been featured on ABC World News Tonight with Bill Blakemore for her research on melatonin/circadian immune responses.

#### Abstract

Humans evolved under daylight and dark nights. The spectral content of natural light changes from morning through afternoon and evening and, with these changes, the chemistry and physiology of the human body is dramatically altered. This impacts both health and well-being. Complete darkness at night (or red light, 600-700nm) is as important as daylight to human health. The human immune response is circadian and responds to the light/dark cycle. The



morning blue light (460-500 nm) stimulates a vigorous immune response against bacteria and other pathogens, while darkness at night enhances an anti-tumor response. Inadequate daylight in the morning leads to increase risk for infectious disease, while visible light at night increases the risk for breast and prostate cancer. It is important to consider not only the Color Rendering Index, glare and luminance but also the spectrum (wavelengths) of light emitted from natural or artificial light sources and its appropriateness for the time of day. This seminar will help architects and lighting engineers design the proper lighting environment for homes, schools, workplaces, hospitals and nursing homes for maximum health, comfort and productivity.

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