

UV-A: Biological Effects of Ultraviolet Radiation with Emphasis on Human Responses to Longwave Ultraviolet

John A. Parrish, R. Rox Anderson, Frederick Urbach and Donald Pitts
New York: Plenum Press, 1978, 262 pp.

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This book provides a review of current knowledge about longwave ultraviolet radiation with particular emphasis on human biological responses and criteria for human exposure. The emphasis in the book is on effects from the longer wavelength UV-A (320-400 nm) while comparisons are made to effects of other wavelengths (UV-B and C) in order to place these in perspective. This emphasis is particularly important because of the need for greater understanding of effects from this spectral region. The amount of UV-A reaching the earth's surface is much greater than that of shorter wavelengths—photosensitive reactions are mostly mediated by UV-A and it can potentiate effects of other wavelengths. In addition, UV-A is transmitted by most window glass and plastics that do not transmit the shorter wavelengths.

The book begins with a brief review and discussion of the basic physics associated with electromagnetic radiation including its production, absorption, detection and dosimetry. This section represents about one fifth of the book and as with any review is concise. Some background in either chemistry or physics is assumed but a careful reader needs no other material. Other books such as *Introduction to Research in Ultraviolet Photobiology* by John Jagger are available to provide additional background material.

The topic of dosimetry is justly addressed in some detail. Much of the literature in photobiology, as well as other discussions concerning the effects of physical agents, lacks adequate measurement of radiation parameters. Various optical systems including detectors and filters are discussed. Of particular use are descriptions of advantages, disadvantages and potential problem areas associated with the different types of equipment and procedures. As mentioned, this introduction is useful but brief. Details on physical characteristics of sources and particulars of dosimetry can be found in such sources as *Ultraviolet Radiation* by L.R.

Koller. The inclusion by the authors of a list of U.S. manufacturers of UV-related instrumentation and accessories is particularly helpful.

The major portion of the book is a discussion of bioeffects of UV-A. The authors examine the effects of UV-A on the skin and the eyes, as well as the relation of UV-A to the processes of aging and carcinogenesis. The authors include a timely discussion of standards of exposure. Throughout these discussions, the authors provide necessary introductory and background materials. However, when the subject is truly beyond the scope of the book—such as the detailed anatomy and structure of skin—many references to appropriate resources are given. Liberal use of well-captioned figures strengthens their explanations. The inclusion of definitions of medical terms not familiar to many readers is certainly helpful.

The discussion of bioeffects is accomplished by presentation of details of a few selected experiments to emphasize vital points; both U.S. and foreign journals are cited. These sections are strengthened by the authors' comments on both the strong and weak points of the various experiments. The inclusion of summaries of effects proves to be useful.

In summary, readers or researchers in the fields of photobiology and the medical and environmental sciences will find this to be a useful compilation of information in the field of ultraviolet radiation. The many references provided make the book a useful resource for the field.