

---

## Preface

Biological interactions of visible light with photosensitizers have been studied for over a century while controlled clinical applications of light and photosensitizers to treat solid tumors (photodynamic therapy) have been evolving since the mid-1970s. There are hundreds of excellent publications describing basic, preclinical, and clinical applications of PDT for both malignant and non-malignant disorders. However, I believe this book provides the first comprehensive description of methods and protocols specifically related to relevant mechanistic, dosimetric, preclinical, and clinical procedures used in current PDT research.

Thinking “outside the box” is a cliché that seems to garner too much play these days in areas of biomedical science. However, back in the early 1970s, Tom Dougherty, working at Roswell Park, exhibited true out-of-the-box scientific thinking along with a naive determination that successfully brought a totally new therapeutic procedure to the clinic. Tom provides a very interesting and enjoyable history in the introductory chapter of the book on exactly how PDT got its start in his laboratory at Roswell Park. As Tom’s first graduate student, I was fortunate to be working in his laboratory during that exciting time period.

During those early days of PDT-directed research, it was assumed that when cells were exposed to a photosensitizer, porphyrin derivatives being among the most often used, and visible light, that photochemically generated reactive oxygen species killed these cells by simply damaging cell membranes and/or vital subcellular structures. This certainly plays a role in PDT-mediated cell kill, but as is clearly observed and described in this book, numerous signal transduction and cell death pathways are also involved. The *in vivo* situation is even more complex. A growing number of studies are demonstrating that immunological, tumor microenvironmental, and vascular responses are all contributing to PDT treatment outcomes. Photophysical methods to monitor treatment responses are now providing real-time analysis of PDT doses and PDT efficacy. Finally, effective clinical trials remain the primary long-term objective of all PDT research. A variety of PDT applications for both malignant and non-malignant diseases and disorders are now showing promise. The goal of this book is to provide the reader with current and useful protocols that can be used to evaluate mechanisms and applications of PDT. Leading PDT scientists and clinicians have contributed to this book by providing chapters with clear roadmaps, methodologies, and suggestions that should prove beneficial to new investigators just starting out in PDT research as well as seasoned investigators changing the direction of their research.

I would like to thank all of the contributors of this book for their efforts, enthusiasm, and patience. I also want to thank John Walker, Series Editor, for his consistent encouragement and assistance.

*Charles J. Gomer*



<http://www.springer.com/978-1-60761-696-2>

Photodynamic Therapy

Methods and Protocols

Gomer, C.J. (Ed.)

2010, XI, 296 p., Hardcover

ISBN: 978-1-60761-696-2

A product of Humana Press