

Preface

I think you might dispense with half your doctors if you would only consult Dr. Sun more

—Henry Ward Beecher

Light was used thousands of years ago by the Egyptians, Chinese, and Indians for the treatment of certain skin diseases; however, the actual birth of photodynamic therapy (PDT) was established roughly 100 years ago by the work of Scientists, namely Raab, von Tappeiner, and Finsen. Current interest in PDT only resurfaced in the early 1970s with the emergence of the water-soluble photosensitizer Hematoporphyrin Derivatives (HPD).

Photodynamic therapy is a promising new modality for cancer treatment, which involves the combination of a photosensitizing agent, which is selectively taken up and retained by Tumor cells, and light of an appropriate wavelength. Separately, each of these factors is harmless; however, when they are combined in the presence of oxygen, cytotoxic reactive oxygen species are produced, which leads to irreversible cellular damage and causes cell death and tumor destruction. It is a treatment modality for the management of cancer that can be added to surgery, radiotherapy, chemotherapy, immunotherapy, and targeted molecular therapies.

The idea of writing a book on PDT came to me over 20 years ago. I was encouraged to pursue this vision after I obtained impressive results in the control of noxious insects and parasites that represent one of the biggest health problems in Egypt, especially the *Schistosoma*, which Egyptians have been suffering from since ancient Egyptian times. The successful field application using PDT for the control of Malaria in African swamps was the real challenge and has shown to be a promising implementation of PDT. However, as one can realize from the extensive work published every day, that there is rapid progress in the clinical application. It is worth mentioning, that the greatest progress in PDT has been in the diagnosis and treatment of malignant tumors.

The driving force to initiate the book process was when an international conference on Photodynamic Therapy was held in the German University in Cairo (GUC) on February 2, 2012. I was honored to be the chairperson of this conference and most of the Authors that contributed to the book participated as keynote speakers. I shared my vision with my colleagues, and they all willingly welcomed the idea and agreed to contribute to the book.

This book will acquaint readers with the history and basic principles of PDT, as well as the fundamentals of the theory, methods, and instrumentation of clinical diagnosis and treatment of cancer. It will also discuss nononcological applications such as functional targeting of bacteria, treatment of microbial infection and vector control of Malaria, Filaria, and Dengue Fever, and the control of other parasites and noxious insects. The Authors, all experts and pioneers in their field, discuss the reasons behind the treatment with PDT along with its advantages and pitfalls. This comprehensive book is unique in its structure as it combines both the theory and application of PDT.

It is also worth mentioning that this book will tackle state-of-the art research and fill in the holes left by other literatures. Since both Scientists and Physicians have contributed to this book, this cooperation will hopefully assist in bridging the gap between the bench and the clinic. *Photodynamic Therapy: From Theory to Application* will be considered a standard reference for researchers of different levels whether they are postgraduate students or active researchers in chemistry, biochemistry, biology, and biophysics. It will also be in high demand for physicians and specialists working on medical diagnosis and treatment in the field of cancer, antimicrobial PDT, as well as the photodynamic control of parasites and noxious insects.

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