

# Preface

This volume, intended for professionals and researchers in the fields of life sciences, biotechnology, and drug discovery, contains discussions of several aspects of bioactive essential oils and their potential clinical use in treating or preventing cancer. It is a valuable source of information and studies for all people who work with natural products, especially with applications in cancer. We present chemical structures designed to help the reader understand the key concepts of the chemical and pharmacological properties of essential oils.

The content of the book is divided into 15 chapters. Chapter 1 provides an overview of cancer pathogenesis and therapies. Several genetic aspects are covered, including critical genes and epigenetics in cancer, metastasis, epidemiology, and environmental risk factors. This chapter also discusses the main therapeutic approaches in cancer, such as surgery, radiotherapy, and chemotherapy. In Chap. 2, the reader is introduced to the chemistry of essential oils. Key concepts, classification of the constituents of essential oils, and methods of analysis are some of the topics discussed. In short, the authors describe the relevant chemical aspects of aromatic plants and the chemical structures of the major compounds found in their essential oils. Chapter 3 describes the features of botanical classification of the main families containing plants that produce essential oils. Pharmacobotanical aspects of selected species are described. Chapter 4 presents recent developments in the synthesis of anticancer drugs from essential oil constituents, demonstrating the potential of this class of natural products as starting materials for the development of anticancer drugs. Chapter 5 introduces some successful examples of the use of medicinal chemistry tools applied to essential oils constituents focusing on antitumor activity. Chapter 6 reports some clinical studies with essential oil and chemical constituents. Chapter 7 describes the selected studies on antitumor activities of essential oils obtained from aromatic plants. A description of the general aspects of these plants and chemical composition of their essential oils is also presented. The antitumor monoterpenes found in essential oils and their possible mechanisms of action are reported in Chap. 8. The antitumor sesquiterpenes found in essential oils are described in Chap. 9; selected studies containing the mechanisms of action of essential oils are presented in the chapter. Chapter 10 presents a literature review on phenylpropanoids from essential oils which have antitumor activity. Chapter 11

presents a comprehensive description of synergy and interaction of essential oil and the chemical constituents with drugs used in cancer therapy or other antitumor constituents. The use of essential oil components as cancer preventive agents is outlined in Chap. 12. Geraniol and farnesol are two selected constituents discussed in this topic as dietary bioactive food components with promising applications in cancer chemoprevention. Chapter 13 discusses the use of aromatherapy in promoting well-being of patients with cancer. Depression and anxiety, commonly found in people suffering from cancer, can affect the immune system and worsen the health of the patient. The use of psychotherapeutic essential oils for inhalation can help in the treatment of these patients by improving the quality of life. The perillyl alcohol is a monoterpene found in essential oils with significant antitumor activities. The scientific reports are promising and contain several clinical studies. Chapter 14 describes the studies of a research group using perillyl alcohol monoterpene. The experience of many years of research with perillyl alcohol is demonstrated in the results of clinical analyses and magnetic resonance imaging of patients undergoing treatment with perillyl alcohol, notably via inhalation. Chapter 15 comments on the potential of essential oils for use in cancer therapy and future prospects.

I hope that this book will stimulate readers to appreciate the importance of natural products as health-promoting resources and generate a discussion and reflection on new approaches in cancer therapy.

Damião Pergentino de Sousa  
João Pessoa, Brazil

Bioactive Essential Oils and Cancer

de Sousa, D.P. (Ed.)

2015, XV, 292 p. 53 illus., 15 illus. in color., Hardcover

ISBN: 978-3-319-19143-0