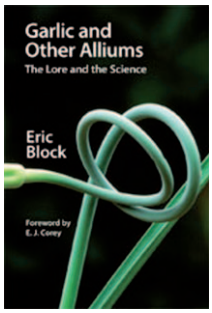
Garlic and Other Alliums

The chemistry of garlic, onions, and other *Allium* species has captured the fascination of scientists for the last 100 years—from August von Hofmann, the founder of the German Chemical Society, to Nobel laureate Artturi Virtanen, and more recently the author of the book which is the subject of this review, Eric Block. Uncovering the identities and origins of the smelly and often tear-inducing compounds produced by alliums has been a challenging endeavour, owing largely to both the highly reactive nature and volatility of the organosulfur compounds that are synthesized and metabolized within these organisms. This has kept Block, his predecessors, and his contemporaries busy for many years now, and the fruits of their labour are now culminated in *Garlic and Other Alliums*. Block is the ideal person to write this book—he is a key contributor to virtually every aspect of the field over the past 40 years. Whilst his focus has always been on the chemistry of these species, Block has also become an expert on many aspects of alliums, from horticulture to botany to medicine, as well as their role in art and culture. The breadth of his interests in alliums is well represented in this book.

The book is well organized, and presents something for everyone. It should be said right away that this is far from a typical "chemistry" book due to both the varied content and the style of presentation. Chapters 1 and 2 provide an introduction to *Allium* botany and cultivation, and the role of alliums in literature, the arts, and culture. While there is no chemistry in these chapters per se, it is an enjoyable read nonetheless, and serves to set the stage for the beautiful chemistry described in Chapters 3 and 4, which make up the bulk of the book. These "chemistry" chapters focus largely on the most common and best studied of the alliums—garlic and onion. Aptly entitled "Allium Chemistry 101" and "Chemistry in a Salad Bowl", respectively, they are written to be understandable to non-specialist readers, making even the most technical parts appealing to a wide audience. The focus is primarily on Block's—and others'—use of the choice analytical technique of the day to elucidate the identities of the compounds responsible for the odors, flavors, and lachrymatory effects of the alliums, as well as the synthetic efforts to prepare authentic standards with which to compare, and a discussion of the mechanistic underpinnings of their formation in nature, or upon manipulation in vitro. This part of the text provides several examples of many of the unique aspects of organosulfur chemistry, as well as applications of various chromatographic and mass-spectrometric techniques—both classical and modern—for their study.

The final two chapters detail the uses of alliums in folk and contemporary medicine, and the role of alliums in the environment. Chapter 5 presents the purported medicinal—therapeutic and/or preventive—activities of alliums. Much of this chapter focuses on garlic, and provides a critical relation and interpretation of the results of clinical and/or epidemiological trials of garlic's effects on everything from cardiovascular disease and cancer to vertigo—debunking some of the claims of the garlic-supplement industry along the way as unsatisfactorily founded on a scientific basis. Chapter 6 describes the uses of alliums and extracts thereof as sources of allelopathic and antimicrobial agents, and discusses their potential as herbicides, pesticides, and antibiotics.

This book contains an extensive bibliography, making it a highly useful resource for the identification of key contributions to the field, and also reviews which provide a more detailed presentation of the chemistry of the alliums. The monograph, as a whole, was carefully put together, as only a few relatively insignificant and largely editorial mistakes were noticed. Keeping with the "atypical chemistry book" theme, Block has included an appendix which contains reproductions of historical illustrations of 29 alliums by the German botanist Ludwig Reichenbach originally published in 1848. Whilst more puritan readers may not appreciate this addition, perhaps considering it to be "filler", others will relish it. Likewise, some may not enjoy Block's anecdotal presentation of much of the content of the book, while others will find it refreshing. This reader thinks it all works rather well together; it is a fine example of how complex chemistry can be contextualized in a fascinating and often entertaining way.



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Derek A. Pratt
Department of Chemistry
Queen's University, Kingston (Canada)

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