
Preface

More than 15 years have passed since publication of the last monograph on anthracycline antibiotics, the ACS Symposium Series 574, edited by W. Priebe. However, anthracycline antibiotics continue to be one of the most applied antitumor agents, mostly in combination therapy. In addition, a number of exciting new developments such as prodrug development or new synthetic, semi-synthetic, or biosynthetic derivatives have emerged in spite of a certain decrease in synthetic activity. With this background in mind, I accepted the invitation of Prof. J. Thiem to edit an updated collection of reviews on anthracycline antibiotics. In fact, this task turned out to be an exciting endeavor and instead of the initially planned single volume, the numerous contributions from many experts in this exciting field had to be collected into two volumes. The last decade has provided a much greater amount of new information than initially anticipated and these volumes represent a condensed review of this data derived from journals representing quite different fields.

The first volume is dedicated to biological occurrence and biosynthesis as well as the synthesis and chemistry of anthracyclines. Since the pioneering review of H. Brockmann on naturally occurring anthracyclines in 1963, no systematic overview has appeared and this volume will provide a review of the latest information. This topic is closely related to biosynthesis and the intriguing progress in biotechnology to produce biosynthetic anthracycline variants is presented. The part of the volume covering synthesis comprises an updated overview on asymmetric synthesis, combinatorial synthesis using the Diels–Alder reaction, synthesis of fluorinated anthracyclines, the sugar moieties, non-natural glycosyl anthraquinones as DNA binding and photo-cleaving agents, and finally of anthracyclines and fredericamycin A via strong base-induced cycloaddition reaction.

The second volume is devoted to mode of action, clinical aspects, and new drugs. At this point I would like to thank F. M. Arcamone for his invaluable help in selecting the topics and authors of this second volume. Knowledge of the molecular mechanisms of anthracycline activity is of prime importance, also for clinical application, and therefore this is the first contribution of the second volume. The most severe side effect of anthracyclines and many other anticancer drugs is cardiotoxicity, and this has to be given prime importance. Future attempts at reducing this and other side effects include the

development of less toxic prodrugs. Therefore, four reviews within this volume are dedicated to this topic: Daunomycin-TFO conjugates for downregulation of gene expression, acid-sensitive prodrugs of doxorubicin, anthracycline-formaldehyde conjugates and their targeted prodrugs, and doxorubicin conjugates for selective delivery to tumors. Last but not least, two chapters are devoted to the recent development of new and hopefully even better anthracycline anticancer drugs: Sabarubicin and nemorubicin. Clinical development of these compounds is approaching and will hopefully give encouraging results.

The two volumes on anthracyclines cover a large area from biotechnology to synthesis and clinical application. Thus, although the chemical aspects dominate, the books will be of value to a broader spectrum of readers looking for recent information on this most important class of antitumor antibiotics.

It has been a great pleasure to work with the competent team of Springer, in particular Dr. Marion Hertel and Birgit Kollmar-Thoni. They have my thanks in addition to all of the authors for their (mostly) timely contributions.

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Karsten Krohn