
Preface

The inspiration behind this volume of *Methods in Molecular Biology: Metabolomics Tools for Natural Product Discoveries* is to unite the diverse methodologies and protocols that have developed from classical natural product chemistry now transitioning to modern day metabolomics to identify bioactive secondary metabolites for the purpose of drug discovery. Natural product chemistry maybe regarded as an older science with the isolation of many natural products between the 1970s and 1990s mainly due to the advent of improved, highly sensitive separation methods, mass spectrometry, and nuclear magnetic resonance spectroscopy. Therefore, it is worthwhile to summarize recent advancements in current comprehensive analytical platforms and present how metabolomics is now being integrated into this classical field to dereplicate and profile natural product extracts.

The aims of this book are to discuss and in part review, how natural product chemistry is transitioning to metabolomics as a result of the advent of comprehensive analytical platforms. Applications for the extraction of selected natural products (secondary metabolites) from less common sources such as bryophytes and hard corals are presented. Various biological assays including anticancer, anti diabetic, antibacterial, and various metabolomic, biomarker, and dereplication strategies are discussed. Comprehensive applications and strategies for gas chromatography-mass spectrometry (GC-MS) (polar metabolite profiling and fatty acid analysis), liquid chromatography-mass spectrometry (LC-MS) (untargeted profiling and lipidomics), and nuclear magnetic resonance (NMR) spectroscopy (profiling) metabolomic-based studies are discussed. Finally, protocols and strategies for the structure elucidation of isolated natural products by NMR, determination of absolute configurations, and the discovery, biosynthesis, and engineering of novel enterocin and wailupemycin polyketide analogues and the synthesis of K₁ and K₂ melatonin metabolites are presented.

Methods in Molecular Biology: Metabolomics Tools for Natural Product Discoveries is targeted at chemists, biologists, pharmacologists, students, and researchers in related fields to appreciate the current available methodologies and protocols for natural product isolation, biomarker discovery, dereplication, biological assays, and comprehensive metabolomic platforms available for high-throughput analyses.

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Metabolomics Tools for Natural Product Discovery

Methods and Protocols

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