Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis

Vladimir Savic

Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis

Vladimir Savic

Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis
Vladimir Savic
The discovery of abyssomicin class of natural products has been the outcome of the search for secondary metabolites possessing inhibitory effect on p-aminobenzoic (pABA) acid biosynthesis, a biosynthetic pathway found in many microorganisms but not in humans. The earliest members of this family, abyssomicins B, C, and D, were isolated from the marine actinomycete Verrucosispora AB-18-032, collected from a sediment sample from Japanese sea at 289m depth. Abyssomicin C was the first natural product to act as an inhibitor of the enzymes involved in pABA and folic acid biosynthesis. In addition to these initial members of the family, other related compounds were also isolated and characterized: atrop-abyssomicin C, abyssomicins G, H, E, I, J, K, and L. Interestingly, only abyssomicin C and atrop-abyssomicin C, which was initially discovered during the synthesis of the former compound and later isolated from the fermentation product, show activity against Gram-positive bacteria. The structural resemblance of abyssomicins to the chorismic acid transition state analogues is evident, while distinctive activity is related to the presence of the conjugated ketone functionality. The structural novelty of abyssomicins and very promising biological properties spurred interest among synthetic organic chemists. The complex molecular architecture and a number of challenging structural elements, such as a fused tetronate bicyclic core with a strained 11-membered macrocyclic ring, necessitate a conscientious synthetic plan and several routes were reported in the literature. Intramolecular Diels–Alder reaction was used in the biomimetic synthesis as a strategically major step in building the polycyclic skeleton (below scheme, path A). The diene functionality was attached to the tetronic moiety possessing the exocyclic double bond to set a scene for the key cycloaddition step, which then afforded the core abyssomicin structure in a highly regio- and diastereoselective manner. Further elaboration of the cycloadduct produced the abyssomicin C. Related but different strategy employed the Lewis acid-templated intermolecular Diels–Alder reaction to assemble a highly substituted cyclohexane product (above scheme, path B). The cyclohexane ring formation via the cycloaddition reaction was followed by introduction of the tetronic moiety to form the spiro compound. The macrocyclic ring was then introduced by combining the nucleophilic properties of 2-Li-tetronate and the ring-closing metathesis as key transformations. An alternative approach to the Diels–Alder reaction employed an intramolecular variant of the nucleophilic displacement onto the π-allyl palladium complex to afford a highly substituted cyclohexane derivative (above scheme, path C). Further elaboration of this product provided access to the spirotetronic derivative via an attractive gold-catalyzed cyclization of the propargyl compound. Final assembly of the macrocyclic ring was accomplished employing the nucleophilic properties of 2-Li-tetronate and, in this instance, a particularly impressive Nozaki–Hiyama–Kishi reaction.

From reader reviews:

Princess Bequette:

Do you have something that you like such as book? The guide lovers usually prefer to pick book like comic, small story and the biggest you are novel. Now, why not attempting Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis that give your satisfaction preference will be satisfied by simply reading this book. Reading behavior all over the world can be said as the way for people to know world considerably better then how they react towards the world. It can't be mentioned constantly that reading behavior only for the geeky individual but for all of you who wants to possibly be success person. So , for all you who want to start reading through as your good habit, you may pick Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis become your current starter.

Dale Eich:

This Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis is great guide for you because the content which can be full of information for you who also always deal with world and still have to make decision every minute. This kind of book reveal it data accurately using great coordinate word or we can claim no rambling sentences within it. So if you are read it hurriedly you can have whole details in it. Doesn't mean it only provides straight forward sentences but tough core information with attractive delivering sentences. Having Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis in your hand like keeping the world in your arm, information in it is not ridiculous 1. We can say that no guide that offer you world within ten or fifteen moment right but this reserve already do that. So , this can be good reading book. Heya Mr. and Mrs. hectic do you still doubt which?

Diane Welton:

This Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis is brand-new way for you who has attention to look for some information because it relief your hunger info. Getting deeper you onto it getting knowledge more you know or perhaps you who still having bit of digest in reading this Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis can be the light food for you because the information inside this kind of book is easy to get by simply anyone. These books produce itself in the form which is reachable by anyone, yeah I mean in the e-book contact form. People who think that in book form make them feel sleepy even dizzy this guide is the answer. So there is absolutely no in reading a e-book especially this one. You can find actually looking for. It should be here for an individual. So , don't miss it! Just read this e-book kind for your better life in addition to knowledge.

Jack Bell:

As a scholar exactly feel bored to help reading. If their teacher requested them to go to the library in order to make summary for some guide, they are complained. Just very little students that has reading's spirit or real their passion. They just do what the teacher want, like asked to go to the library. They go to right now there but nothing reading very seriously. Any students feel that examining is not important, boring as well as can't see colorful pictures on there. Yeah, it is for being complicated. Book is very important for you. As we know that on this period of time, many ways to get whatever we want. Likewise word says, ways to reach Chinese's country. Therefore this Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis can make you truly feel more interested to read.

Read Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic for online ebook

Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic books to read online.

Online Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic ebook PDF download

Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic Doc

Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic Mobipocket

Studies in Natural Products Chemistry: Chapter 5. Abyssomicins: Isolation, Properties, and Synthesis by Vladimir Savic EPub