Young Career Focus: Dr. Bill C. Hawkins (University of Otago, New Zealand)

Background and Purpose. SYNFORM regularly meets young up-and-coming researchers who are performing exceptionally well in the arena of organic chemistry and related fields of research, in order to introduce them to the readership. This Young Career Focus presents Dr. Bill C. Hawkins (University of Otago, New Zealand).

Biographical Sketch

Dr. B. C. Hawkins

Bill C. Hawkins completed his PhD at the University of Wollongong, Australia (Prof. Pyne and Prof. Keller) in 2007, followed by post-doctoral positions at the University of Melbourne, Australia (Prof. Rizzacasa) and Ecole Polytechnique, France (Prof. Zard). After a short stay at the Walter and Eliza Hall Institute of Medical Research (Australia), he joined the Department of Chemistry at the University of Otago (New Zealand) as a lecturer (2012) and was promoted to senior lecturer in 2016. His research interests include the synthesis of bioactive natural products and their use as chemical probes to understand biological processes and inform drug design, as well as the development of new synthetic methodologies. He is the recipient of several awards including the Thieme Chemistry Journals Award (2019) and the Easterfield Medal (RSC/NZIC, 2019).

INTERVIEW

SYNFORM *What is the focus of your current research activity?*

Dr. B. C. Hawkins Natural products and synthetic derivatives have and will continue to represent a critical source of pharmaceuticals, accounting for almost 50% of clinically used drugs. Despite the first lab-based synthesis of urea occurring almost 200 years ago, and the incredible advances in synthetic methods since then, we are still far from achieving ideality in synthesis. Our research is focused around developing efficient synthetic methods to access bioactive compounds, with a particular focus on natural products. Specifically, current efforts are aimed at utilizing donor–acceptor cyclopropanes as building blocks for the rapid synthesis of medicinally relevant scaffolds and target oriented synthesis. Current synthetic targets in the lab include spiroaspertrione A and spirocalcaridines A and B (Figure 1).

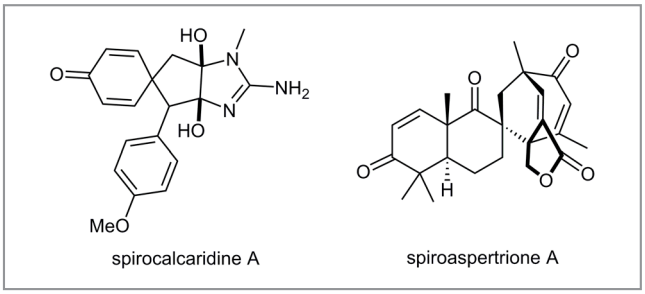

Figure 1 Current synthetic targets in our laboratory

SYNFORM *When did you get interested in synthesis?*

Dr. B. C. Hawkins Science in general has always fascinated me; however, my interest in chemistry came in high school and my love of organic synthesis was sparked during my un-

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dergraduate studies. The idea of being the first to synthesize or create a new molecule and elucidate its properties, or develop an elegant synthesis of a known compound, continues to inspire me! The contribution and impact made by early pioneers in the field of total synthesis, such as Woodward and Stork, demonstrated a beauty and creativity that was simply breath-taking. Just from reading the literature it was abundantly clear to me that this was the field I wanted to be a part of.

SYNFORM *What do you think about the modern role and prospects of organic synthesis?*

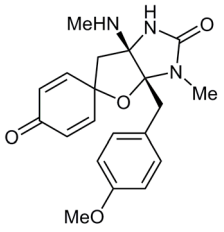
Dr. B. C. Hawkins Organic synthesis will always be a cornerstone in science, a truly enabling discipline that has facilitated the expansion of many disciplines (for example materials, polymers, supramolecular chemistry, and chemical biology). Both fundamental and translational research are important in a modern society. However, the current trend towards overlooking fundamental research in favor of translational research is short-sighted and ultimately slows progress in organic synthesis and science in general. Serendipity and unexpected results are often the source of game-changing discoveries; by focusing solely on applied research, opportunities to uncover truly unique/unexpected processes could be missed.

SYNFORM *Could you tell us more about your group's areas of research and your aims?*

Dr. B. C. Hawkins Our research efforts are relatively broad, encompassing synthetic methodology based around utilizing ring strain to allow entry into medicinally relevant scaffolds, through to target-oriented syntheses. More recently, we have begun a medicinal chemistry program centered around natural products synthesized in our lab. The end goal of our work is to develop fast and efficient entry into medicinally relevant chemical entities. These molecules can then be used as biological tools for collaborators to use to probe cellular processes, and consequently increase our understanding of disease processes and ideally help in the rational design of drugs.

SYNFORM *What is your most important scientific achievement to date and why?*

Dr. B. C. Hawkins Thanks to the hard work of my research group, we have developed several useful synthetic methods to access important compound classes such as oxazinones,[1,2] chromones[3] and benzannulated spiroketals.[4] However, my group's synthesis of the marine natural product spiroleucettadine (Figure 2) is probably the most important achievement of my independent career to date.[5,6] This synthesis has enabled access to large quantities of spiroleucettadine and the subsequent uncovering of unexpected biological activity, which in turn has led us to pursue a medicinal chemistry program focused on establishing a structure–activity relationship and also, with the help of collaborators, efforts have begun to establish the mechanism of action of spiroleucettadine.



spiroleucettadine

Figure 2 Spiroleucettadine is a member of the Leucetta derived alkaloids

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