Bioorganic Chemistry 43 (2012) 1

Contents lists available at SciVerse ScienceDirect

Bioorganic Chemistry

journal homepage: www.elsevier.com/locate/bioorg

Editorial

Joint Editorial

Bioorganic Chemistry has always been a journal that people have viewed as providing expert coverage and review of the 'mechanisms of Biology'. It is the better understanding of this mechanistic biology that we believe has never been more important. In many ways, current strategic re-evaluations of how discoveries can be better made and exploited emphasize that there has never been a greater need for such precise insight into biological processes. Such insight may increasingly become seen as the link that has perhaps been missing and that would have enabled (and will enable) more progressive development of molecular concepts into Biology and Medicine.

To this end, *Bioorganic Chemistry*, as a journal with a rich history, will concentrate on its role as the primary specialist journal for this type of focused mechanistic understanding. This is its remit, to provide such understanding through molecular investigation and we continue to be excited by the papers that we publish that go beyond vaguely interfacial investigations and shine unique light onto such 'nuts and bolts' of this science.

Accordingly, the six reviews in this issue represent a broad range of topics and techniques in mechanistic enzymology. In addition to advancing our fundamental understanding of enzyme catalysis, the work described in these reviews underscores the importance of mechanistic enzymology in drug development. The issue opens with a review by Liu and co-workers on enzyme-catalysed decarboxylation reactions. The authors survey the various catalytic strategies used by decarboxylases to carry out this very important process in the presence and absence of coenzymes and metal ions. In the second review, McCarthy and Bandarian discuss the current state of knowledge on the functions and biosynthesis of 7-diazapurines. These structurally diverse compounds are found in numerous biological niches and have potential uses as antibiotics, anti-fungal, anti-viral, and anti-neoplastic agents. In the next review, Andrews and McLeish discuss their work on the thiamine diphosphate-dependent decarboxylases. These enzymes are found in all forms of life and have potential industrial and medical importance. Two enzymes that catalyse uracil methylation are the subjects of the fourth review by Kohen and co-workers. Understanding the mechanisms of these enzymes could lead to the development of new antimicrobial drugs. Following this review, Porter and Miller discuss their work on kinetic cooperativity in monomeric enzymes such as glucokinase, an important drug target to treat type 2 diabetes. This unusual phenomenon is not a new one, but new insights have been unearthed using transient state kinetics, NMR spectroscopy, and single-molecule methods. In the final review, the authors describe their work on the less studied group of cis-prenyltransferases, which generate polymers of isoprenoids with chain lengths of C50 and longer. One of these transferases plays a key role bacterial cell wall peptidoglycan biosynthesis, making it a potential drug target.

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0045-2068/$ - see front matter
http://dx.doi.org/10.1016/j.bioorg.2012.05.001