
Chemical Biology, according to the view of Editor Stuart Schreiber (Nat. Chem. Biol. 2005, 1, 64–66) seeks to identify and characterize the naturally occurring and synthetic small molecules that bind to and modulate the actions of “nature’s DNA, RNA, and protein macromolecules residing within their cellular contexts”. In the words of the publisher’s statement on the back cover of the books, “Chemical biology has become the new buzz-word in organic chemistry and in the life sciences, describing a new era in the interplay between the two disciplines and still on the rise.” Yet, as is made clear in the very first essay, chemical biology and medicinal chemistry share closely related procedures and goals, as well as an extensive network of philosophical, historical, theoretical, and experimental roots. Although it may be an overstatement to suggest, as Gough and Crews do in their discourse, that chemical biology is established on a “unique foundation”, many of the contributions to this treatise, briefly considered here, are of special importance to medicinal chemists and the drug discovery community.

The three volumes comprise 39 themes edited and written by major investigators in chemical biology from 74 academic and 23 industrial institutions located in Europe (51), the U.S. (45), and Japan (1). Most articles include sections on the outlook, introduction, history and development, general considerations,
reviews managerial challenges encountered at Aventis in implementing chemical biology platforms. Groom and coauthors provide an extremely interesting and challenging updated categorization of the druggable genome. They determined that approximately 3500 genes encode proteins druggable via druglike small molecules, whereas only 170 are targets for approved small molecule drugs. Other papers are directed to the subjects of target families, NMR studies of kinase–ligand interactions, nuclear receptors and their interactions with ligands, GPCR targets and their interactions with ligands, protein–protein interactions, and the prediction of ADMET properties. Final discussions include the systems biology of cellular signal transduction and gene profiling by means of genome-wide expression analysis.

In general, this compendium is very well-written and produced, although some figures are too small to be useful (e.g., Figures 6.4, 6.20, 9.2-7, and 17.2-6). Figure 3.1-8, intended for color, is confusingly printed in black. This valuable and thought-provoking series is highly recommended for acquisition by individuals and libraries in the drug discovery community.

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