FOREWORD

Bioinformatics has come a long way since it entered the 'world stage' with the publication of the first bacterial genome sequence in *Science* in 1995. That publication showcased the power of computer programs in assembling a genome sequence with more than a million base pairs and making sense of the sequence through the process of annotation. These two tasks remain active areas of investigation, but bioinformatics research now encompasses many other topics, several of which are covered in this book.

We are now more than 15 years into the 'big data revolution', in which molecular biology is playing an important part. Harris Lewin from the University of California at Davis has suggested that 'genomic amount of data' is a better reference than the usual 'astronomical amount of data,' for describing huge datasets in various fields. It goes without saying that huge amounts of data require huge advances in the methods for processing these data. That explains why machine learning, pattern analysis, error correction, and novel statistical techniques continue to play crucial roles in biological discovery, and all of them are explored in chapters of this book.

The more we understand the information contained in biological sequences, or in OMICS datasets in general, the more papers we write and publish. That of course adds to the ever-increasing body of scientific literature. It is an interesting sign of the current age that much additional knowledge can be gained from automatic processing of this mass of papers by specialized techniques, which go by the general name of text mining. This is another key bioinformatics research area, also exemplified in this collection.

In sum, this book contains high-quality chapters that provide excellent views into key topics of current bioinformatics research, topics that should remain important for the next several years. For the future, we can also expect that 'data integration' will be a dominant theme, providing exciting new research problems for bioinformaticians. Advances in this theme, by life scientists as a whole, should result in significant improvements to our own health as well as to the health of the planet that still is our only home.

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