

PREFACE

The life sciences, comprising the study of living organisms, is the most prominent example of modern interdisciplinary research where complex processes are investigated by means of particular scientific disciplines. Important contributions are made by disciplines that study molecular structure, interactions and their implications for function.

This text is meant for everyone who studies or has an interest in molecular aspects of the life sciences. It aims to provide the background for tools and methodologies originating from the core disciplines of chemistry and physics applied to investigation of problems relevant to the life sciences.

With this text, we attempt to fill a gap by presenting relevant methodologies in a manageable volume, but with strong emphasis on describing the fundamental principles for the individual methods covered. Deliberately, we have chosen to include mathematical formulas where we found them to be of integral importance for the matter discussed. A powerful feature of mathematical equations is their ability to capture relationships between different parameters that can be complicated when described in words. Not least, almost all formulas are an essential part of the work and analysis in a scientific project and are thus a tool used in real-life applications. We hope that the combination of discussion, illustration and mathematical expressions deliver a representation of a phenomenon from different aspects, helping to form an understanding of the methodologies, rather than just a memory.

This book is in large parts based on lectures we developed at The University of Edinburgh, Griffith University, University of Lyon, and the University of Queensland. Consciously or unconsciously, many colleagues we have learned from have made contributions. Data for many figures and tables in this book have been obtained from experiments conducted particularly for this book. We are very grateful to Dr Michelle Colgrave (CSIRO, Brisbane), Dr Nien-Jen Hu (Imperial College London) and Lawren Sullivan (Griffith University) for providing experimental data used in various figures. Manuscript and figures for this book have been compiled entirely with open source and academic software under Linux, and we would like to acknowledge the efforts by software developers and programmers who make their products freely available.

Recommendations for further reading and websites of interest have been compiled based on popular acceptance as well as the authors'

preferences; however, the selections evidently are not exhaustive. In cases where commercial supplier websites are listed, these have been included based purely on educational value; the authors have not received any benefit from those companies in this context.

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