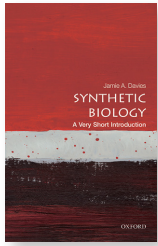


Synthetic Biology: A Very Short Introduction by **Jamie Davies**



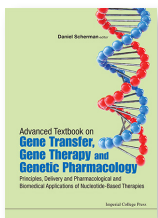
When Mary Shelley wrote *Frankenstein* in 1818, she probably did not see synthetic biology coming. Shelley's unorthodox use of galvanism and vivisection may have become computational biology, protein engineering and genome editing, but – many scientists would argue – has lost none of its gothic charm. As a truly interdisciplinary field, synthetic biology has been around – at least in its modern molecular incarnation – since Stanley Cohen and Herbert

Boyer genetically engineered the first plasmid in 1973. In *Synthetic Biology: A Very Short Introduction*, Jamie Davies starts us off on the 'creation of new living systems by design' with one of many predictable clashes – between the economic forces who swear by the promise of synthetic biology and the bioethicists whose reservations keep this field at arm's length. As most books in the *Very Short Introduction* series, Davies' pocket-size guide provides readers with a thorough and engaging introduction to the biology and methods of synthetic biology while touring its numerous applications, from saving our oceans to changing the way we produce drugs. Davies does a great job of sketching a field concerned with the deliberate redesigning of life. As with other great introductions, by the end of this book, one cannot help oneself, but wanting to know more.

Pedro Ferreira

(Biochemical Society, UK)

Advanced Textbook on Gene Transfer, Gene Therapy and Genetic Pharmacology (second edition) edited by **Daniel Sherman**



This textbook is aimed at biochemical and medical graduates and beyond and builds upon the first edition, published in 2014, with the addition of several new chapters reflecting updates in the field. It would be of particular value to those wanting to understand the clinical applications of gene therapy. The chapters are divided into four parts.

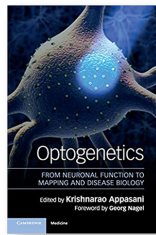
Part I provides an introduction of basic principles including useful discussions around the history of gene therapy and the principles of different genetic modification strategies. Part II focuses on vectors and gene delivery techniques including viral and non-viral strategies. Part III then moves towards the therapeutic applications of gene therapy discussing cancer gene therapy, immunodeficiencies

and neurological disease and contains the main updates from the first edition. New chapters included here are focused on CAR-T cells and their use in cancer immunotherapy, therapies for severe combined immunodeficiencies (SCID) and cystic fibrosis. Finally, part IV focuses on vector production and safety. The volume of information covered in this book is reflected in the heavy word count. Those looking for succinct phrasing and lots of diagrams may find this level of information difficult to process; however, those willing to work their way through the text will find interesting discussions about different applications and thus can improve their technical knowledge.

Lucy Elphick

(University of Surrey, UK)

Optogenetics: From neuronal Function to Mapping and Disease Biology by **Krishnarao Appasani**



Optogenetics came onto the scene with the same lightning bolt as its opsins. Decades of research on rhodopsins and photostimulation of neurons culminated in the ground-breaking and wondrous year of 2005, including the first report of behavioural control of an animal via genetically targeted photostimulation (Susana Lima and Gero Miesenböck; *Cell*, **121** (1): 141–52) and the first single-component optogenetic system for neural control, using channelrhodopsin-2 (ChR2; Ed Boyden and Karl Deisseroth, including Georg Nagel who developed the ChR2–eYFP construct; *Nature Neuroscience*, **8** (9): 1263–8). In *Optogenetics: From Neuronal Function to Mapping and Disease Biology* (2017), Krishnarao Appasani edits an encyclopaedic volume on the ins and outs of optogenetics. Nagel pens the foreword and reminds us that rhodopsins, ChR2 included, were not 'invented for optogenetics', and that their discovery 'resulted from basic research on light-sensitive membrane proteins and on phototaxis on green algae'. As with many other scientific fields, optogenetics owes an immense debt of gratitude to transdisciplinary basic research. More than 10 years on, Appasani's collection does a good job of reviewing the state of the art of the field, from the biology of opsins and their use in different model organisms to the applications of optogenetics in neuropsychiatric, memory and vision research. Technical details aside, one essential message of this volume is clear – that optogenetics will keep on shining for many years to come.

Pedro Ferreira

(Biochemical Society, UK)