Advance Book Information

Big Data in Predictive Toxicology

Daniel Neagu University of Bradford, UK
Andrea-Nicole Richarz European Commission - Joint Research Centre, Italy

Synopsis
The rate and volume of toxicological data generation is continually growing due to novel techniques and software. The amplified pace and capacity of data generation has repercussions for organising and analysing data output. This book discusses these challenges as well as the nature, storage, analysis and interpretation of toxicological big data. It details how these data are applied in toxicity prediction, modelling and risk assessment. This title is relevant for researchers and postgraduates in the fields of computational methods, applied and physical chemistry, cheminformatics, biological sciences, predictive toxicology, and safety and hazard assessment.

Brief Contents
- Big Data in Predictive Toxicology - Challenges, Opportunities and Perspectives
- Biological Data in the Light of Toxicological Risk Assessment
- Chemoinformatics Representation of Chemical Structures – A Milestone for Successful Big Data Modelling in Predictive Toxicology
- Organisation of Toxicological Data in Databases
- Making Big Data Available: Integrating Technologies for Toxicology Applications
- Storing and Using Qualitative and Quantitative Structure–Activity Relationships in the Era of Toxicological and Chemical Data Expansion
Advance Book Information

Carbon Capture and Storage

Mai Bui Imperial College London, UK
Niall Mac Dowell Imperial College London, UK

Synopsis
This book will provide the latest global perspective on the role and value of carbon capture and storage (CCS) in delivering temperature targets and reducing the impact of global warming. As well as providing a comprehensive, up-to-date overview of the major sources of carbon dioxide emission and negative emissions technologies, the book also discusses technical, economic and political issues associated with CCS along with strategies to enable commercialisation.

Brief Contents
- Introduction – Carbon capture and storage
- Understanding the role of CCS deployment in meeting ambitious climate goals
- Solvent-based Absorption
- Ionic Liquids
- CO2 Capture by Adsorption Processes
- Oxy-fuel combustion capture technology
- Chemical Looping Technologies for CCS
- An Introduction to Subsurface CO2 Storage
- Carbon capture and storage from industrial sources

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Decellularized Extracellular Matrix

Characterization, Fabrication and Applications

Tetsuji Yamaoka National Cerebral and Cardiovascular Center Research Institute (NCVC), Japan
Takashi Hoshiba Tokyo Metropolitan Industrial Technology Research Institute, Japan

Synopsis

Takashi Hoshiba and Tetsuji Yamaoka have brought together, for the first time, leading contributors to provide a fundamental guide to the decellularized extracellular matrix. Focussing on the sources of dECM, preparation, characterization and applications of dECM in regenerative medicine and biological systems, this is a must-have resource for those working in regenerative medicine and tissue engineering.

Brief Contents

- Extracellular matrix scaffolds for tissue engineering and biological research
- Preparation methods for tissue/organ-derived dECMs – effects on cell removal and ECM changes
- Preparation of cultured cell-derived decellularized matrix (dECM) - factors influencing dECM formation and its ability
- Bared Basement Membrane Substrata: Design, Cellular Assembly, Decellularization and Application to Tissue Regeneration and Stem Cell Differentiation
- A Novel Treatment for Giant Congenital Melanocytic Nevi Combining Inactivated Nevus Tissue by Pressurization and Cultured Epidermal Autograft

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 Synopsis
Without interstellar dust, the Universe as we see it today would not exist. Yet this vital ingredient was first considered merely an irritating fog that prevented a clear view of stars and nebulae in the Milky Way and other galaxies. We now know that interstellar dust has essential roles in physics and chemistry, in the formation of stars and planetary systems, in the creation of the building blocks related to the origin of life, and in the movement of those molecules to new planets. This is the story the authors tell in this book. Appealing to a general audience, it is the first attempt to discuss interstellar dust at an accessible level with any chemical presentations kept to a minimum.

 Brief Contents
- Interstellar Dust in Galaxies
- What are Dust Grains made of? How to find their Chemical Composition
- What is the Structure of Interstellar Dust Grains? How to find their Physical Composition
- Some Old Stars are “Smoking Like Candles”: Is this where Interstellar Dust Grains Come from?
- What happens to Stardust in Interstellar Space?
- Doing Chemistry in the Dark: How Interstellar Dust leads to Molecular Complexity in the Interstellar Gas
- Catalytic Chemistry in Space? Reactions on Bare Dust Grains

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Health Claims and Food Labelling

Sian Astley EUROFIN, UK

Synopsis
Increasing numbers of foods carry nutrition and/or health claims on their packaging. These need to be regulated in order to protect consumers from false claims, and to promote foods with proven health benefits. This title explores the use of nutrition and health claims around the world, the impact of legislation on consumers especially understanding of the terminology used, and likely developments in the future. It is a valuable reference for those in the food industry, as well as in the regulatory environment.

Brief Contents

- European food information regulations: Recent developments
- Impact of health claims regulations on the food industry and future innovation potential
- Health claims regulation: Opportunities and challenges in Europe
- Use of nutrition and health claims and symbols on pre-packed foods in Europe: From consumer exposure to public health implications
- Supporting the European Food Industry to Meet Nutrient Labelling Regulations
- Measuring the effects of health claims and symbols: the CLYMBOL methodological toolbox

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Histological Techniques
An Introduction for Beginners in Toxicology

Robert Maynard  University of Birmingham, UK
Noel Downes  Sequani Limited, UK
Brenda Finney  Sequani Limited, UK

Synopsis
Histological techniques form the basis of many areas of research, yet they can often be poorly understood. Aimed at postgraduate students and those at an early stage of their career, this title provides a detailed and comprehensive introduction to the techniques and how to apply them successfully.

Brief Contents
- An Introduction to Histopathology
- The Light Microscope
- How to Examine Histological Sections
- Tissue Processing
- Embedding Media and Sectioning
- Attaching Sections to Slides and Mounting
- Standard Staining Techniques
- The Theory of Histological Staining
Advance Book Information

In-cell NMR Spectroscopy

From Molecular Sciences to Cell Biology

Yutaka Ito  Tokyo Metropolitan University, Japan
Volker Dötsch  University of Frankfurt, Germany
Masahiro Shirakawa  Kyoto University, Japan

Synopsis

In-cell NMR spectroscopy is a relatively new field. Despite its short history, recent in-cell NMR-related publications in major journals indicate that this method is receiving significant general attention. No informative books specifically focused on in-cell NMR have been published yet. This book provides detailed descriptions covering the background of in-cell NMR, methods for in-cell biological techniques and NMR spectroscopy, as well as applications, and future perspectives. Researchers in biochemistry, biophysics, molecular biology, cell biology, structural biology as well as NMR analysts interested in biological applications will all find this book valuable reading.

Brief Contents

• Brief History of In-Cell NMR Studies
• In-Cell NMR in Bacterial Cells
• In-Cell NMR in Eukaryotic Cells – I Introduction From Outside of Cells
• In-Cell NMR in Eukaryotic Cells – II Intrinsic Protein Expression
• Protein Structure Determination In Living Cells From NOE-Derived Distance Restraints
• Protein Structure Determination in Living Cells from PCS and PRE
• Bioreactor System
• 19F In-Cell NMR
• Whole Cell Solid-State NMR

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Mimicking the Extracellular Matrix

The Intersection of Matrix Biology and Biomaterials

Gregory A Hudalla University of Florida, USA
William L Murphy University of Wisconsin - Madison, USA

Synopsis

Materials which are able to mimic the properties of the extracellular matrix are of great interest for many therapeutic and biomedical applications. Edited by leading experts in the field, this book brings together the current knowledge of extracellular matrix biology with the state-of-the-art of extracellular matrix-mimicking biomaterials. The book is suitable for both biologists and bioengineers interested in the extracellular matrix, and provides material scientists with a benchmark for future efforts to develop synthetic biomaterials as extracellular matrix mimics.

Brief Contents

- Matrix biology: Extracellular matrix - Building function through complexity
- Matrix biology: Gradients and patterns within the extracellular matrix
- Matrix biology: ECM turnover and temporal fluctuation
- Matrix biology: Structure assembly of maminin-rich matrices
- Biomaterials: Incorporating ECM-derived molecular features in biomaterials
- Biomaterials: Modulating and tuning synthetic extracellular matrix mechanics
- Biomaterials: Protein interactions with glycosaminoglycan-based biomaterials for tissue engineering
- Biomaterials: Spatial patterning of biomolecule presentation using biomaterial culture methods

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Polymer Colloids
Formation, Characterization and Applications
Rodney Priestley Princeton University, USA
Robert Prud’homme Princeton University, USA

Synopsis
Based on a specialised course by the editors, this book provides the reader with an invaluable single source of reference on polymer colloids. The first section describes formation, explaining basic properties of emulsions and dispersion polymerization, microfluidic approaches to produce polymer-based colloids and formation via directed self-assembly. The next section details characterisation methodologies from microscopy and small angle scattering, to surface science and simulations. Finally, the book finishes with chapters devoted to applications, including pickering emulsions, active matter, and molecular engineering for materials development.

Brief Contents
- Development, Characterization, and Application of Novel High Temperature Thermoplastic and Thermosetting Dispersions
- Synthesis of Core-Shell Polymer-Based Colloids
- Flash Nano-Precipitation and -Complexation to Produce Polymer Colloids
- Design and fabrication of polymer microparticles and capsules using microfluidics
- Recent Advances in Colloidal Polyelectrolyte Brushes
- The Advanced Microscopy of Colloids
- Simulations in Polymer Colloid Formation
- Glass transition and crystallization in colloidal polymer nanoparticles

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Solid Rocket Propellants
Science and Technology Challenges

Haridwar Singh Defense Research and Development Organisation, India
Himanshu Shekhar Defense Research and Development Organisation, India

Synopsis
Presenting up-to-date practical and theoretical aspects of rocket propellants and propulsion, this book is a much needed addition to the post graduate level literature. Covering all relevant information including formulation, processing and evaluation, it will be vital for students and researchers working in the area of solid rocket propellants in all sectors namely academics, the propellant industry, propellant production, quality control and associated agencies such as the armed forces, defence and space organisations. The authors bring together a wealth of accumulated knowledge into one book aiding future generations to meet the challenges in this area.

Brief Contents
- History of Rocketry and Systems
- Rocket Propellants: Classification and Manufacture
- Propellant Ingredients and Their Properties
- Solid rocket propellants: Processing Technologies
- Insulation, Liner and Inhibition System
- Essence of Solid Rocket Propulsion
- Quality Control, Assurance and Reliability
- Process safety
- Ignition System
- Combustion Mechanism

Series:
ISSN:
Publisher: Royal Society of Chemistry
ISBN: 9781839161490
Price: £30.00 | $42.00
Publishing date: 28/11/2019
Target Audience: Professional and scholarly
Format: Paperback
Edition: 1
Size: 234 x 156mm
Pages: 223
BIC: PDG, PN, TG

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