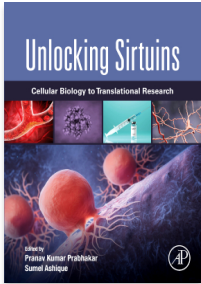
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Unlocking Sirtuins

Cellular Biology to Translational Research

1st Edition - June 12, 2026 • Latest edition

Imprint: [Academic Press](#)

Editors: Pranav Kumar Prabhakar, Sumel Ashique

Language: English • Paperback ISBN: 9780443453809

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Description

Unlocking Sirtuins: Cellular Biology to Translational Research explores the intricate roles of sirtuins, from basic principles to clinical significance. The book is organized into six parts, covering foundational concepts, roles in aging and metabolism, disease pathology, therapeutic strategies, future research directions, and potential challenges. Topics include the structure and evolution of sirtuins, their mechanisms of action, and their impact on neurodegenerative diseases, cardiovascular health, and cancer. The book also features detailed chapters on sirtuin modulators, drug discovery, the latest technologies and tools in the field, emerging trends, and the challenges, ethical considerations and future directions of sirtuin-targeted therapies.

The book's content is complemented by case studies, clinical insights, and step-by-step procedures, offering a comprehensive and practical exploration of the subject. Users will find an in-depth overview of sirtuin biology, bridging fundamental science with clinical applications. This comprehensive resource will serve as an essential resource for researchers, clinicians, and advanced students working across cellular and molecular biology, biochemistry, pharmacology, aging, metabolic disorders, translational medicine, and related fields.

Key features

- Provides an interdisciplinary overview of sirtuin biology, bridging foundational science with translational research
- Facilitates the development of sirtuin-targeted therapies for a variety of diseases, including cancer and neurodegenerative disorders
- Highlights cutting-edge tools and technologies for sirtuin analysis
- Includes case studies and step-by-step procedures to support scientists in their own research

Readership

Researchers and scientists working closely with sirtuins across cell biology, molecular biology, biochemistry, pharmacology, biotechnology, translational medicine and

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Part 1: Introduction to sirtuins

1. Sirtuin proteins: structure, functions, and evolutionary insights
2. NAD⁺-dependent enzymatic mechanisms and NAD⁺ precursors (NMN, NR)

Part 2: Sirtuins and aging

3. Sirtuins in senescence, mitochondrial health, and longevity
4. DNA repair and genome maintenance via sirtuin pathways

Part 3: Sirtuins in metabolic regulation

5. Sirtuins and energy homeostasis
6. Role of sirtuins in glucose and lipid metabolism
7. Sirtuins in caloric restriction and fasting responses

Part 4: Sirtuins in disease pathology 8. Sirtuins in neurodegenerative diseases

9. Sirtuins in cardiovascular health
10. The role of sirtuins in cancer progression
11. Sirtuins in inflammation and autoimmunity

Part 5: Therapeutic applications

12. Sirtuin modulators: small molecules and natural compounds
13. Sirtuin-targeted therapies: current challenges, clinical trials, and future directions
14. Translational perspectives in drug discovery

Part 6: Future directions and challenges

15. Emerging trends in sirtuin research
16. Technological advancements in sirtuin analysis
17. Experimental tools for sirtuin modulation: from CRISPR to chemical biology
18. Ethical and clinical implications of sirtuin therapies



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