

Preface

THE PAST TWO DECADES HAVE BEEN TRANSFORMATIVE for telomere biology and telomerase research. Since the publication of *Telomeres, Second Edition*, 2006, the field has experienced an exponential increase in publications, reflecting both the depth and breadth of discovery. In 2009, the award of the Nobel Prize in Physiology or Medicine to Elizabeth Blackburn, Carol Greider, and Jack Szostak recognized the pioneering work that first brought telomeres and telomerase to the forefront of modern biology. This milestone underscored the central importance of telomeres to genome stability, cellular aging, and cancer.

In the years since, the pace of progress has only accelerated. Powerful new technologies, from single-molecule imaging to large-scale genomics, proteomics, and artificial intelligence, have enabled ever more detailed insight into telomere structure, regulation, and function. The scope of the literature has expanded accordingly, as has the translational impact of the field, with advances in diagnostics, therapeutic strategies, and clinical applications.

This volume is intended as a compendium, presenting an opportunity to lay out the striking progress made in this rapidly advancing field. As with the literature itself, the chapters in this volume have expanded, covering topics that range from the molecular architecture of telomeres and telomerase to the mechanisms underlying the Alternative Lengthening of Telomeres (ALT) Pathway, and the growing interface between telomere biology, human health, and therapeutic innovation.

We are well aware that this research topic is vast and have endeavored to assemble a representative slice that captures the diversity of perspectives and the dynamism of ongoing discovery. The contributions in this volume are authored by many of the leading scientists in the field, whose insights collectively offer both an authoritative reference and an inspiration for future research.

In bringing together this collection, our aim has been to showcase how far the field has advanced since 2006, and to provide a foundation for the next generation of breakthroughs. Telomere biology continues to exemplify the interplay of fundamental curiosity and translational promise, ensuring its place at the heart of biomedical research for years to come.

We thank Danett Gil, Barbara Acosta, Richard Sever, and their colleagues at Cold Spring Harbor Laboratory Press for their considerable effort in bringing this volume to completion, and for their patience in coordinating chapters and accommodating the inevitable delays that come with assembling a work of this scope. Their support has been invaluable in keeping this project on track. We feel fortunate to work in such a vibrant and rapidly evolving field, and we hope that this new edition of an old favorite will not only serve as a trusted reference but also spark thought, provoke investigation, and motivate new directions for the years ahead.

JULIA PROMISEL COOPER
EROS LAZZERINI DENCHI
JOACHIM LINGNER
HILDA A. PICKETT