

Preface

The "Progress in Cell Cycle Research" series has been conceived to serve as a collection of reviews on various aspects of a fast growing biology field, the cell division cycle. These reviews do not pretend to cover all aspects of cell cycle regulation and mechanisms but rather focus on a few topics of particular interest in the recent literature.

This third volume starts with a broad overview of the diversity of ways by which viruses subdue their host cell cycle (chapter 1). Of particular interest in this area is the case of HIV which has recently been extensively investigated (chapter 2). Although most of our understanding of cell cycle regulation derives from work performed in yeast and animal cells, plant models, reviewed in chapter 3 for one of the best studied example, *Arabidopsis*, are starting to contribute significantly to the cell cycle general picture. In mammals, the regulation of cell division of two types of tissues, the intestine (chapter 4) and the developing muscle (chapter 5) are investigated in an interesting physiological context. Cell division is accompanied by a number of morphological changes. One of them, organelle transport, is starting to be better understood (chapter 6). The next few chapters summarise our knowledge of some essential regulators of the cell cycle. A still intriguing enzyme, casein kinase 2, is reviewed in detail in chapter 7. Some of the most studied cell cycle regulators are certainly the CKI's, cyclin-dependent kinases inhibitors (chapter 8). The INK4 family encodes proteins which are frequently deregulated in human tumours (chapter 9). Recent progress in our knowledge of the structure and functions of p21cip1, another type of inhibitor, is thoroughly presented in chapter 10. As expected, yeast continue to bring a wealth of information on the molecular mechanisms underlying the cell division programme. How *cdc18* initiates DNA synthesis in fission yeast and how S phase entry is regulated in budding yeast are reviewed in the two next chapters (chapter 11 & 12). In mammalian cells, the retinoblastoma protein and related proteins play an essential role in controlling the entry of cells in G1 and S phases (chapter 13). Cyclin E is considered as a key regulator of the G1/S transition. This protein and its implications in human tumours are reviewed in chapter 14. Among the many regulators of DNA replication and repair, the multifunctional PCNA has been one of the most studied (chapter 15). Chapter 16 covers a fast growing area of interest in cell cycle studies, the aberrations of G1- and G1/S-regulating genes in human cancers. The next chapters cover the G2/M part of the cell cycle. The coexisting kinases *nimA* and *cdc2* play an essential role in controlling the G2/M transition, and data from *Aspergillus* is reviewed in chapter 17. A recently cloned gene, *myt1*, encodes a *wee1*-like kinase which specifically phosphorylates the Thr14 residue of *cdc2*. It is the object of chapter 18. Another interesting, but still relatively poorly understood aspect of *cdc2* regulation, is its nuclear translocation following activation (chapter 19). The relationship between *mos* and other cell cycle regulators are presented in chapter 20. Although calcium has been suspected to play essential roles in cell division for many years, this is now clearly demonstrated. However its links with cell cycle regulators still remain to be identified (chapter 21). Chapter 22 analyses spindle assembly mechanisms and the role played by chromosomes in this event. Recent progress in our understanding of centrosome organisation, functions and regulation are presented in chapter 23. The last chapter (24) finally provides a very detailed review of the checkpoints which ensure the proper progression of vertebrate somatic cells through mitosis.

We hope this series of reviews, as up to date as reviews on the cell cycle can be, will be helpful to students and investigators in the vast cell division cycle field as well the oncologists interested by the altered cell cycle regulations in cancer cells. As this book was being sent to the printers, a special issue of *Methods in Enzymology* on "Cell cycle control" came out (Dunphy, 1997). It provides a very helpful series of methods to investigate the cell cycle.

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Dunphy, W. G., (1997), *Methods in Enzymology: Cell cycle control*, Academic Press, London, vol.283, 678pp.