The oncogene handbook

edited by

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and

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AGTCGATGCTTGCATTGCAGTCGATGCTTGC Preface CACTGTCCAGACTTGCAACACTGTCCAGACT

The last decade has witnessed the emergence of the field of Molecular Oncology as an amalgamation of four important disciplines of cancer research, viz., retrovirology, chemical carcinogenesis, cytogenetics and cell-growth regulation. The unifying force for these four major areas of biological research was the discovery that the transforming elements (termed 'oncogenes') of acute transforming viruses were derived from cellular genes (proto-oncogenes) and that these cellular genes were also targets for mutation in naturally occurring human tumors and in tumors induced in animal systems. A second series of experiments demonstrated that these sequences were often located adjacent to chromosomal breakpoints observed in human cancers and were activated in these tumor cells by mechanisms similar to those seen in retroviruses. A third set of observations which indicated that some oncogenes were derived from genes encoding growth factors or their receptors provided, for the first time, a logical connection between cell-growth regulation and neoplasia. Most of these findings were the direct result of the application of recombinant DNA techniques which allowed the cloning of viral oncogenes and their cellular homologs for structural and biological studies. The impetus provided by the development of recombinant DNA technology, coupled with sophisticated instrumentation, has resulted in an explosion of knowledge whose full dimensions have yet to be realized.

Although the field of Molecular Oncology is still very young, it already has a vocabulary that can be bewildering to the uninitiated. Nevertheless, the fundamental importance of this area and its medical implications make a working knowledge essential to students, scientists in other fields and also clinicians. To address this need, we have compiled a reference volume that includes basic information on each oncogene in a concise and reasonably uniform format. It is our hope that this type of organization will allow ready access and cross-referencing.

In arranging the chapters, we have, so far as possible, grouped together oncogenes whose products appear to be related by virtue of their similar biochemical activities or cellular localization. For some oncogenes this is not yet possible and their assignment must await future updates. The group of tyrosine kinases is so large that a comparison of their relevant features also seemed useful and this information is also included. As our knowledge increases, in the future, it may be possible to provide similar comparisons for other groups.

We are grateful to each of the individual authors, without whose contribution this book would not exist, and to our administrating secretary, Helen Parry, whose gentle persuasion kept us all moving along. Compiling a book with so many authors was an

arduous task that took much longer than we expected. We are especially grateful to those authors who submitted their contributions early and had to make pre-publication revisions because of the delays.

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