

TUMOR VIRUSES AND DIFFERENTIATION

Editors

Edward M. Scolnick

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TUMOR VIRUSES AND DIFFERENTIATION

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Preface

The interplay between virology and developmental biology has been responsible for rapid progress in both fields. These two disciplines have come together at many levels of research. The idea that endogenous viral gene products could play a role in development and evolutionary processes (see Temin, page 1) was one of the early concepts that stimulated the link between these two fields of study. Furthermore, the realization that the genome structure of retroviruses resembles transposable elements and the suggestion of McClintock in the late 1950s that controlling elements in maize may have developmental consequences, has again led to the speculation that viral elements could play a direct role in developmental processes. At yet another level, the well-defined tissue tropisms of acute and latent viruses often produce specific developmental consequences and limited tissue pathologies. The concept that some tumor viruses arrest the development of stem cells resulting in the malignant phenotype led naturally to the suggestion that if one could overcome this developmental block and produce terminally differentiated cells, then some cancers could be cured in this fashion. In yet another approach, viruses have been used as probes to study the regulation of gene expression in diverse developmental backgrounds. This has led to the mapping of gene enhancers derived from viral genomes, the study of the role of chromosome positions effects (via virus integration) in gene expression and the mechanistic basis for viral tissue tropisms. Viruses also have been employed as tools in the isolation of cellular genes (via transduction) involved in oncogenesis (onc genes). The normal functions of these cellular onc genes and their possible role in tissue development is under intensive investigation. Finally, viruses have been most useful in defining lineages of stem cell development, notably in the hematopoietic system.

It was with this as a background that a group of scientists involved in these areas of research were assembled to plan the Symposium on Tumor Viruses and Differentiation that was held in March 1982 at Squaw Valley. This group convened in December 1980 and clearly the challenge was to identify the exciting questions that were to be asked a year and one half after the format of the meeting had been planned. The organizers are indebted to David Baltimore, Fred Fox, Norman Iscove, Paul Neiman, Abner Notkins, Irving Weissman and Owen Witte for their insight in structuring what was a very productive and special meeting. This book is the permanent record and product of that meeting. It is a testimonial to the productive interfaces between virology and developmental biology and a guide to the questions of the future. As such, we hope it serves the major purpose of scientific meetings, to provide information that focuses the field and results in rapid experimentation that otherwise might have taken many years to develop.

We gratefully acknowledge generous support from CETUS Corporation which sponsored this meeting, and thank Abbott Laboratories, Diagnostic Division for a gift which helped to defray travel and subsistence expenses. We thank Sandra Malone and members of the symposia staff for their skillful management of the symposium. Finally, we thank Betty Handy who assisted us during a long week of meetings, took care of small and large problems, and, last but not least, encouraged the various participants to submit the manuscripts that form this volume.

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