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 Book Reviews
 

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**Cold Spring Harbor Symposia on Quantitative Biology, vol. 46. Organization of the Cytoplasm, part 1 and 2.** Cold Spring Harbor: Cold Spring Harbor Lab. 1982. i-xvii+493 i-xi+(495)-1047 several figs., several tabs. Hard bound \$ 156.00.

The 46th Cold Spring Harbor Symposium on Quantitative Biology focused on "The Organization of the Cytoplasm". As indicated in the summary of the book, this symposium is the first major symposium to embrace the topic of cytoplasm as a holistic entity. Research on the cytoskeleton of the cell has accelerated rapidly during recent years, resulting in the assimilation of a large reservoir of new information. Because of the complexity of the subject itself and the huge amount of results obtained the book consists of two parts. Part 1 is divided into 5 sections that deal with studies on functional and spatial order in the cytoplasm, water and the cytoplasmic architecture, cytoplasmic and axonal flow, microtubules and intermediate filaments. Part 2 consists of 7 sections, covering microfilaments, surface organisation, clathrin, synthesis, exocytosis, endocytosis, microvilli, calcium regulation and phosphorylation of cytoplasmic components and nucleus and cytoplasm. Some of these sections are more selectively treated such as principles of organisation, elements of organisation and cell surface. Cell biologists are just starting to understand the various regulatory pathways by which the cell mobilizes and directs assemblies of cytoskeletal components. Several presentations deal with the question of how cells regulate the length of actin filaments and microtubules. Progress had been made in the development of procedures for detecting the polarity of cytoplasmic filaments, including those of actin and more recently of microtubules. This major technical achievement will help to solve problems of distribution and motility in the cytoplasm.

The specialisation of fundamental cytoplasmic structures provides functional order and it appears that ordering of such specialized cytoplasmic assemblies falls into two categories: (1) transient assemblies and (2) stable assemblies.

In the present symposium new areas elucidated include the latest information on tubulin genes, control of tubulin transcription, initiation of microtubule assembly, and polarity and spatial distribution. The genetic structure of tubulin genes has now been determined in several species. Chromosomal mapping of tubulin genes has just begun. One of the immediate

benefits of the gene studies has been the elucidation of the amino acid sequence for tubulins. These new data will provide much insight into the evolution and structural heterogeneity of tubulin.

All of the microtubules in each half spindle of the mitotic apparatus appear to display the same polarity. This new finding suggests that the minus ends of microtubules are all attached at the poles and the plus ends are associated with kinetochores.

A new microtubule-associated protein (MAP) was described for the first time at this meeting - Anykrin. It binds to a membrane protein and could provide a possible link between microtubules and cytoplasmic membrane systems, including the plasma membrane. The developments in the intermediate filaments (IF) field are of practical importance. They could lead to improved procedures for tumour cell diagnosis. Because of the developmental expression of IF proteins, monoclonal antibodies should become useful probes for studies of embryology and developmental biology.

Recently a number of actin-binding proteins that function at substoichiometric levels have been identified. The formation of F-actin filaments and the interaction to form a higher order assemble are important features of cytoplasmic organisation. From numerous studies of regulation has come the discovery of the ubiquitous multipurpose  $Ca^{++}$  receptor calmodulin, which is involved in regulating a large number of cytoplasmic enzyme activities.

Some pathways include calcium-sensitive proteins that do not require calmodulin. Another major regulatory pathway of the cytoplasm includes a phosphorylating-dephosphorylating system involving protein kinases and phosphatases.

The above mentioned facts show the diversity of ways leading to a more and more precise description of what cytoplasm is. On one hand the book gives a good survey of this field in that most papers begin with a short review. On the other hand it provides the reader with the newest results, useful methods and in addition it contains quite a number of citations. Thus students as well as experienced cell biologists will benefit from this book.

This valuable book is characterized by its accurate printing and the high quality of the pictures.

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