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BOOK REVIEW

Morphogenesis in a nutshell

Molecular Insights into Development in Humans:
Studies in Normal Development and Birth Defects
Edited by: Moyra Smith
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This is the first edition of a concise 209-page book that provides an overview of the genetic perturbations (mutations and pathway defects) associated with developmental abnormalities in humans. The author draws on inspiration from Aldous Huxley ('And meanwhile the most incredible miracles are happening all around us…a cell in nine months multiplies its weight a few thousands and thousands of times and is a child') and James Paget's comments on malformations ('We ought not to set them aside with idle thoughts or idle words about 'curiosities or chances'. Not one of them is without meaning; not one that might not become the beginning of excellent knowledge...'). The book is subdivided into 16 chapters, with the first sections providing background information that summarizes the current state of knowledge on gene structure and function, epigenetics, signaling pathways, pluripotency and differentiation. The following two chapters cover abnormalities of growth and development, and metabolism and organelles. The final 10 chapters are devoted to specific organ systems, comprising the brain, craniofacial development, heart, vasculogenesis malformations and hematopoiesis, abdominal wall and gastrointestinal tract, lung and diaphragm, liver and pancreas, bone and extracellular matrix, kidney and urinary tract, sex determination, and endocrine glands. Each chapter synthesizes embryology, teratology, clinical and molecular genetic data that pertain to the pathogenesis of birth defects and malformations affecting the different body systems. Discussion of the individual topics is provided with the support of more than 300 references. The chapters are illustrated in black and white, with tables and pathway diagrams that highlight important topics.

The book is astonishing in its scope, covering numerous topics and syndromes and providing a comprehensive overview of the field of genetics/molecular biology as applied to development and morphogenesis. The sheer size of the undertaking, relating to summarizing such a large volume of information in a book of modest dimensions, is a daunting task that the one author has, in general, managed very adeptly. However, it is perhaps inevitable that some of the subject matter is covered unevenly and that those wanting more detailed coverage of specific topics will need to find other sources. The content is devoted to genes and molecular pathways, with relatively reduced coverage of chromosome aberrations and copy number variants that are often critical to normal development; however, a detailed inclusion of cytogenetics would likely have increased the size of the text significantly and it is easy to comprehend why this information was not emphasized.

This text may be utilized as an introduction to the field, although, for the less experienced, it may be dense reading; others may find it useful for revision or to refresh their knowledge of the expanding world of genetic discoveries relating to morphogenesis. The book is unique in the brevity with which it is able to cover a large range of topics; this is both a blessing and a curse. It is perhaps best recommended as a starting point or reference for further research into the genetics and molecular biology of malformations and birth defects.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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