

Oocytes - Maternal Information and Functions**Malgorzata Kloc (ed.), 2017****Results and Problems in Cell Differentiation, Vol. 63****Springer International Publishing AG, Cham, Switzerland****ISBN: 978-3-319-60854-9****Pages: 510 +XI; Figures: 85;****Color figures: 76; € 222,56**

This book presents different aspects of oocytes maturation in several animal models as the interactions oocyte-environment, the specific functions of oocytes molecules and organelles regulated by epigenetic and translational mechanisms and the evolution of maternal factors. The book edited by Malgorzata Kloc (Houston, TX, USA) is divided into five conceptual parts and many interesting topics are presented:

Oocyte Interactions with Environment (3 chapters)

Oocyte Polarity: Molecular and Organellar Aspects and Developmental Consequences (6 chapters)

Epigenetic, Transcriptional and Translational Regulation in Oocytes (5 chapters)

Oocyte Specific Functions of Ubiquitous Molecules and Organelles (5 chapters)

Maternal Factors: Origin, Evolution and Application in Genetic Engineering (2 chapters)

The book is, therefore, reasonably priced (222€; more than five hundred pages and twenty-one chapters) and full of color illustrations enhancing the text written in such a way as to be easily understandable even by those who are not very familiar with female gametogenesis.

The most recent topics covering the whole biology of the female gamete are here presented, as clearly stated by the abstract: "There is no other book in existence, which would combine such a comprehensive list of subjects in one volume. This book is also exceptional and unique in providing the

information that is a cross-section through oocytes from various invertebrate and vertebrate species. This will give the readers a completely new and invaluable perspective on all covered subjects".

The first chapter, unavoidably, deals with the "exogenous molecule and organelle delivery in oogenesis" and it is written by both editors of the Springer series "Results and Problems in Cell Differentiation", Jacek Kubiak (Rennes, France) and Malgorzata Kloc. Here, the authors revise the latest advances in interactions between somatic and germ cells during oogenesis outlining the sources (including the sperm) and the routes taken by the exogenous molecules to be delivered to the female gamete (oocytes/eggs). This is a necessary chapter to fully appreciate the detailed analysis performed by Hugh Clarke on the mechanisms of granulosa cell-oocyte communication "Control of Mammalian Oocyte Development by Interactions with the Maternal Follicular Environment" enriched by an impressive bibliography. Another interesting aspect described in this first section of the book regards the Insects world where the symbionts (obligate hosts for many species) move from one generation to the other through the female gametes. The authors, Teresa Szklarzewicz and Anna Michalik, present what is behind the different strategies of their transmission from one generation to the next with superb EM pictures (Transovarial Transmission of Symbionts in insects).

The following part devoted to the acquisition of oocyte polarity is quite fascinating because still little is known about the formation of the animal-vegetal axis despite the spectacular advancements on how "structural, cellular, organellar and molecular polarity of oocytes is established" thus setting up the bases for the conceptual understanding of the "developmental consequences of polar distribution of maternal information". These cellular and molecular data are obtained by studies done in differ-

ent animal models, including insects and vertebrate species.

The acquisition of oocyte polarity is a long process of cell differentiation providing the morphological structures and molecules essential for fertilization, zygotic genome activation and embryo development as clearly explained in the six chapters of this section.

The third section (five chapters) is dedicated to the epigenetic, transcriptional and translational regulation in zebrafish oocytes and in oocytes of several mammals and it is enriched by explicative (and very nice) illustrations and figures. The following section is devoted to the description of ubiquitous molecules and organelles (centrioles, mitochondria, lipids, vitellogenin, cohesin, condensin, *etc.*) of the oocytes and the role played by them through the meiotic events (sometimes compared with spermatocytes). The last section consists of two intriguing chapters where the role played by maternal factors in the regulation of the very first embryonal developmental steps (both in invertebrate and vertebrate species) are taken into consideration.

The evolutionary origin of *Drosophila* (and other species) maternal genes is here presented together with the cellular dynamics of non-inheritable maternal factors that can be used for genetic manipulation and engineering in the era of CRISPR-cas, as elegantly presented in the very last chapter.

As said, this book is recommended to everyone interested in the wonderful world of *the little laboratory of molecular biology* that is the oocyte.

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