
Preface

The cells of the epiblast give rise to all the tissues of the embryo proper. How epiblast cells acquire pluripotent features and how they transition to form the trilaminar embryo are current topics of intense investigation. A more detailed understanding of these *in vivo* events will lead to improved strategies for *in vitro* cellular differentiation protocols and genetic modification. In *Epiblast Stem Cells: Methods and Protocols*, leading researchers provide a detailed collection of techniques and protocols useful to the study of the biology of the pluripotent epiblast. As embryo development varies in model organisms, this volume includes chapters describing techniques used to study epiblast development in different amniotes. This collection brings contributions from the fields of embryology, stem cell biology and developmental biology together, such that readers can find in a single volume detailed procedures for the isolation and culture of epiblasts at different stages of development and techniques for the study of differentiation into specific lineages. Over the past five years, advances in the molecular characterization of pluripotent cells have led to a new understanding of how metastable states of pluripotency develop during the transition between the early inner cell mass to the late epiblast stage. Exploiting this new knowledge has enabled researchers to develop protocols that capture these novel pluripotent intermediates. These intermediate stages of pluripotency are important for modelling the transitions that these cells undergo *in vivo* and will contribute to improving the development of robust *in vitro* differentiation protocols.

Written in the highly successful *Methods in Molecular Biology*[™] series format, chapters include introductions to their respective topics, a complete list of the necessary materials and reagents, detailed laboratory protocols, and extensive notes providing suggestions on troubleshooting and how to overcome common difficulties.

I hope the chapters presented in this volume will serve as an up-to-date source of novel protocols developed as a result of the new understanding in pluripotency and will contribute to the incremental use of stem cell technologies in different species.

Comprehensive and cutting-edge *Epiblast Stem Cells: Methods and Protocols* serves as a resource to individuals interested in studying the biology of pluripotent cells.

Loughborough, UK

Ramiro Alberio

Epiblast Stem Cells

Methods and Protocols

Alberio, R. (Ed.)

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