

Preface

Over 3 decades of our experience with sperm and oocyte preparation for insemination proves that these procedures are everything but trivial. Although they are regarded as routine daily procedures, the selection of applied techniques depending on the conditions and settings can dramatically affect outcomes. Sperm preparation techniques need to be carefully adapted based on semen parameters, such as after surgical procedure from testicular or epididymal sample, or following cryopreservation. Further, it is approached differently again, if patient is affected by a disease condition, such as HIV and may be prepared differently for IUI, IVF, or ICSI. After fertilization, the choice of culture method and conditions can exert a dramatic effect on the physiology and viability of the growing embryo. A profound understanding is necessary for the shifting metabolomic requirements of the embryo and providing adequate conditions that are essential for the most successful outcome. Moreover, proper assessment of embryo viability is essential to provide the highest success rate. In addition to the traditional morphological embryo evaluation, there are several novel techniques developed in recent years (including genetic, proteomic, metabolomic, and time-lapse assessments) that promise advanced and standardized measurement of embryo viability. Supernumerary oocytes and embryos now can be more efficiently cryopreserved using vitrification, where success critically depends on the suitably selected method and procedure, which can be improved by fully understanding how different conditions affect outcome.

The main objective of this textbook was to provide a comprehensive review on the above topics, presenting detailed descriptions on practical approaches, as well to offer theoretical background to give a full scientific aspect. In addition to the well-established procedures, a large number of well-documented novel techniques and approaches are presented by authors, who are pioneers in their field. As a result, this textbook is indispensable resource for all embryologists, postgraduate students in clinical embryology, cryo-biologists and researchers working in assisted reproduction field.

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