

Zsolt Peter Nagy
Alex C. Varghese
Ashok Agarwal
Editors

Practical Manual of In Vitro Fertilization

Advanced Methods and
Novel Devices

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Foreword

Even more than 3 decades after the birth of Louise Brown and the birth of several millions of children conceived by numerous procedures of assisted reproductive technology (ART), the *Practical Manual of In Vitro Fertilization: Advanced Methods and Novel Devices* is very welcome. The book is edited by Zsolt Peter Nagy, Alex Varghese, and Ashok Agarwal and consists of more than 70 different chapters written by experts in the field. The authors are mostly from North America, but the book includes some experts from Europe and Australia.

The large numbers of chapters are categorized into different major sections: general organization of ART laboratory, the equipment and culture systems used, the characteristics of the oocytes, different procedures of embryo culture, sperm processing and selection, different insemination procedures, the evaluation and grading of embryos, biopsy of oocytes and embryos, cryopreservation of gametes, embryos and tissues, embryo transfer procedures, accreditation and licensing and legislation in different countries. The last part of the *Manual* consists of a series of special topics.

As is the case in all multiauthor books (in this case more than 70 chapters), it is not surprising that there is some diversity in how the different topics are reported. This is the balance between a textbook by one or two authors and a textbook involving not far from two hundred authors. The *Manual* has its place for all involved in the area of reproductive medicine and biology. It is useful for those novices in the field as for those with years of experience. It is especially focused to the ART laboratory which junior and senior embryologists will find very useful. Since ART requires a multidisciplinary approach to be successful, this book has very useful information for all professionals, including reproductive endocrinologists, counselors, nurses, psychologists, etc.

I am convinced that this *Manual* will be of great value for those involved in ART and will be an important aid for all practitioners.

André Van Steirteghem

Preface

In vitro fertilization (IVF) is the most advanced medical technology for the treatment of infertility. During this process, oocytes from the woman and the sperm from the man are brought together outside of the body, in an “artificial” environment (initially using glass made test tubes or Petri dishes and from which the name of the procedure in vitro originates). The first successful application of this technology was in 1978, marked by the birth of world’s first “test-tube baby,” Louise Brown. Since then, it is estimated that well over four million babies have been born thanks to IVF and thanks to Patrick Steptoe and Robert Edwards. In recognition for this achievement, the Nobel Prize in Physiology or Medicine in 2010 was awarded to Robert G. Edwards. Since the first breakthrough, there have been several significant discoveries and improvements made related to this technology, helping to increase its efficiency several fold.

This textbook has been written with the aim of providing the most comprehensive update on all laboratory aspects of IVF, both theoretical and practical sides, in great detail. In addition, this book also describes several novel techniques that are currently considered experimental, but that in a few years time may become standard procedures.

A total of 75 chapters are included in this book, focused around the following topics: Setting Up and Running an IVF Laboratory; IVF Laboratory Equipment and Culture Systems; In Vitro Fertilization; Embryo Culture Methods; Sperm Processing and Selection; Insemination Procedures; Micromanipulators and Micromanipulation; Embryo Evaluation, Grading, and Assisted Hatching; Biopsy Procedures on Oocytes and Embryos; Cryopreservation; Embryo Transfer; Management and Regulation in the ART Laboratory; and Special Topics. It is of particular interest that these topics were written by the most acclaimed and acknowledged professionals of our field, 184 in total, representing all continents of the world.

Because of the wide range of topics and the comprehensive theoretical and detailed practical descriptions, this book is an ideal reference for all who are involved with assisted reproduction, including embryologists, andrologists, reproductive endocrinologists, and scientists, regardless if one wishes to obtain a basic understanding or a deep, up-to-date presentation.

We would like to thank Richard Lansing, Executive Editor, for his support and advice and Margaret Burns, Developmental Editor, for her enthusiastic and continuous efforts in reviewing and editing each of the manuscripts. Furthermore, we are thankful to all of the outstanding contributors for sharing their knowledge and for being part of this great project. Finally, we are indebted to our families, who provided their support and understanding when time was taken away from them.

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Contents

1 Journey of Human Gametes In Vitro: 1978–2010	1
Zeev Shoham	
Part I Setting Up and Running an IVF Laboratory	
2 Building the Laboratory	9
Dean E. Morbeck and Marlena Duke	
3 Air Quality Management	17
Johan Guns, Ronny Janssens, and Martine Vercammen	
4 Organizational Aspects of the Laboratory in a Tertiary Care ART Center	27
Nancy L. Bossert and Christopher De Jonge	
5 Quality Control Management	33
William R. Boone and H. Lee Higdon III	
6 Daily, Weekly, and Regular Preparations for the IVF Laboratory	41
Michael A. Britt and Klaus E. Wiemer	
7 Risk and Safety in the IVF Clinic	45
Peter Sjoblom and Julius Hreinsson	
Part II IVF Laboratory Equipment and Culture Systems	
8 Essential Instruments and Disposable Supplies for an IVF Laboratory	55
Leslie Weikert, Christa Fralick, and Klaus E. Wiemer	
9 Co₂ and Low-O₂ Incubators	61
Marius Meintjes	
10 IVF Workstations	71
Nicolas Prados and Alex C. Varghese	
11 Culture Media in IVF: Decisions for the Laboratory	79
Jason E. Swain and Thomas B. Pool	

Part III In Vitro Fertilization

- 12 Oocyte Denuding**..... 93
Roberta Maggiulli, Filippo Ubaldi, and Laura Rienzi
- 13 Assessment of Oocyte Quality** 105
Basak Balaban, Turgay Barut, and Bulent Urman
- 14 Polarization Microscopy**..... 121
Markus Montag, Maria Köster, and Hans van der Ven
- 15 Cumulus Cell Gene Expression in Assessment of Oocyte Quality** 127
Dagan Wells

Part IV Embryo Culture Methods

- 16 Short Culture: Day 1/Day 2/Day 3 Embryo Culture** 133
Patrick Quinn
- 17 Extended Culture in IVF**..... 141
David K. Gardner and Michelle Lane
- 18 In Vitro Maturation of Human Oocytes** 151
Baris Ata, Jack Huang, and Ri-Cheng Chian
- 19 In Vivo Embryo Culture Device** 161
Claude Ranoux
- 20 Microfluidics for Gamete Manipulation and Embryo Culture**..... 171
Gary D. Smith, Charles Bormann, and Shuichi Takayama

Part V Sperm Processing and Selection

- 21 Sperm Assessment: Traditional Approaches and Their Indicative Value**..... 185
Margot Flint, Fanuel Lampiao, Ashok Agarwal, and Stefan S. du Plessis
- 22 Sperm Assessment: Novel Approaches and Their Indicative Value** 193
De Yi Liu, Harold Bourne, Claire Garrett, Gary N. Clarke, Shlomi Barak,
and H.W. Gordon Baker
- 23 Sperm Processing for IVF** 199
Ralf Henkel
- 24 PESA/TESA/TESE Sperm Processing**..... 207
Sandro C. Esteves and Sidney Verza Jr.
- 25 Processing Sperm Samples in HIV-Positive Patients**..... 221
Thamara Vilorio, Marcos Meseguer, Antonio Pellicer,
José Remohí, and Nicolás Garrido
- 26 Intracytoplasmic Morphologically Selected Sperm Injection**..... 229
P. Vanderzwalmen, Magnus Bach, Batsuren Baramsai, A. Neyer,
Delf Schwerda, Astrid Stecher, Barbara Wirleitner, Martin Zintz,
Bernard Lejeune, S. Vanderzwalmen, Nino Guy Cassuto, Mathias Zech,
and Nicolas H. Zech

27 Sperm Testing and ICSI Selection by Hyaluronic Acid Binding: The Hyaluronic Acid-Coated Glass Slide and Petri Dish in the Andrology and IVF Laboratories	241
Gabor Huszar	
28 Electrophoretic Sperm Separation	259
Steven Fleming and John Aitken	
29 Magnetic-Activated Cell Sorting of Human Spermatozoa.....	265
Enver Kerem Dirican	
30 Polscope-Based Sperm Selection	273
Luca Gianaroli, Cristina Magli, Andor Crippa, Giorgio Cavallini, Eleonora Borghi, and Anna P. Ferraretti	
 Part VI Insemination Procedures	
31 Intrauterine Insemination	281
Gautam N. Allahbadia and Rubina Merchant	
32 Conventional IVF Insemination	297
Liesl Nel-Themaat, Thomas Elliott, Ching-Chien Chang, Graham Wright, and Zsolt Peter Nagy	
33 Intracytoplasmic Sperm Injection.....	307
Gianpiero D. Palermo, Queenie V. Neri, Devin Monahan, Takumi Takeuchi, Peter N. Schlegel, and Zev Rosenwaks	
34 Mechanism of Human Oocyte Activation During ICSI and Methodology for Overcoming Low or Failed Fertilization.....	321
Dmitri Dozortsev and Mohammad Hossein Nasr-Esfahani	
 Part VII Micromanipulators and Micromanipulation	
35 Hydraulic Manipulators for ICSI.....	329
Hubert Joris	
36 Research Instruments Micromanipulators.....	335
Steven Fleming and Catherine Pretty	
37 Eppendorf Micromanipulator: Setup and Operation of Electronic Micromanipulators	341
Ehab Abu-Marar and Safa Al-Hasani	
38 The Leica Microsystem' IMSI System	347
Christiane Wittemer, Bruno Laborde, Frederic Ribay, and Stephane Viville	
39 Automated Robotic Intracytoplasmic Sperm Injection.....	353
Zhe Lu, Xinyu Liu, Xuping Zhang, Clement Leung, Navid Esfandiari, Robert F. Casper, and Yu Sun	
40 Oocyte Treatment and Preparation for Microinjection	361
Thomas Ebner	
41 Livestock Production via Micromanipulation.....	371
Akira Onishi and Anthony C.F. Perry	

Part VIII Embryo Evaluation, Grading, and Assisted Hatching

- 42 Pronuclear Scoring in Human In Vitro Fertilization**..... 379
Lynette Scott
- 43 Cumulative Morphological Assessment of Embryo Quality**..... 385
Barry Behr and Aparna Hegde
- 44 Metabolomics: The *ViaMetrics-E*TM Procedure for Assessing Embryo Viability**..... 405
D. Sakkas, L. Botros, M. Henson, K. Judge, and P. Roos
- 45 Oxygen Consumption as an Indicator of Oocyte and Embryo Viability** 413
Ana S. Lopes
- 46 Gene Expression Changes During Human Early Embryo Development: New Applications for Embryo Selection**..... 421
Samir Hamamah, Said Assou, Imène Boumela, and Hervé Dechaud
- 47 Amino Acid Turnover as a Biomarker of Embryo Viability** 431
Christine Leary, Danielle G. Smith, Henry J. Leese, and Roger G. Sturmey
- 48 Real-Time Embryo Monitoring Device for Embryo Selection** 439
Gábor Vajta and Thorir Hardarson
- 49 Assisted Hatching in IVF**..... 445
Itziar Belil and Anna Veiga

Part IX Biopsy Procedures on Oocytes and Embryos

- 50 Polar Body Biopsy**..... 455
Markus Montag, Maria Köster, K. van der Ven, and Hans van der Ven
- 51 Cleavage-Stage Embryo Biopsy**..... 461
Alan R. Thornhill
- 52 Embryo Biopsy for PGD: Current Perspective**..... 473
Steven J. McArthur, Don Leigh, Maria Traversa, James Marshall, and Robert P.S. Jansen
- 53 Microarrays and CGH for PGD of Chromosome Abnormalities and Gene Defects**..... 483
Gary Harton and Santiago Munné

Part X Cryopreservation

- 54 Sperm Cryopreservation**..... 493
Fabio Firmbach Pasqualotto, Eleonora Bedin Pasqualotto, Edson Borges Jr., and Ashok Agarwal
- 55 Slow Freezing of Oocytes**..... 509
Giovanni Coticchio and Lucia De Santis
- 56 Vitrification: Research in Animal Models**..... 517
Gábor Vajta
- 57 Oocyte Vitrification**..... 523
Ana Cobo

58	Slow Freezing of Embryos	529
	Liesl Nel-Themaat, Ching-Chien Chang, Thomas Elliott, Patricia Bernal, Graham Wright, and Zsolt Peter Nagy	
59	Vitrification of Embryos	539
	Juergen Liebermann, Joe Conaghan, Zsolt Peter Nagy, and Michael Tucker	
60	Directional Freezing of Reproductive Cells, Tissues, and Organs	547
	Amir Arav	
61	Ovarian Tissue Cryopreservation	551
	Jennifer L. Kulp, J. Ryan Martin, and Pasquale Patrizio	
Part XI Embryo Transfer		
62	Assessment of Uterine Receptivity	559
	Hakan Cakmak and Hugh S. Taylor	
63	Single Embryo Transfer	567
	Thorir Hardarson and Matts Wikland	
64	Ultrasound-Guided Embryo Transfer (Abdominal/Vaginal): An Evidence-Based Evaluation	571
	Ahmed M. Abou-Setta	
65	Cumulus-Aided Embryo Transfer	575
	Firuz R. Parikh, Nandkishor J. Naik, Dattatray J. Naik, and Dhanajaya Kulkarni	
Part XII Management and Regulation in the ART Laboratory		
66	Data Management in the ART Laboratory: Requirements and Solutions	583
	Timothy Brown and Bruce R. Gilbert	
67	Regulation, Licensing, and Accreditation of the ART Laboratory	593
	Doris Baker	
68	Legislation in the United Kingdom	605
	Rachel Cutting	
69	Regulation, Licensing, and Accreditation of the ART Laboratory in Europe	611
	Julius Hreinsson and Peter Sjoblom	
70	Regulation, Licensing, and Accreditation of ART Laboratories in India	619
	B.N. Chakravarty and Rita Modi	
71	Troubleshooting in the Clinical Embryology Laboratory: The Art of Problem-Solving in ART	631
	Kathryn J. Go, Jay C. Patel, and Rick Dietz	
Part XIII Special Topics		
72	The Role of Mitochondria in the Establishment of Developmental Competence in Early Human Development	641
	Jonathan Van Blerkom	
73	Nuclear and Cytoplasmic Transfer: Human Applications and Concerns	659
	Josef Fulka Jr. and Helena Fulka	

74 Cytoskeletal Architecture of Human Oocytes with Focus on Centrosomes and Their Significant Role in Fertilization	667
Heide Schatten, Vanesa Y. Rawe, and Qing-Yuan Sun	
75 Molecular Mining of Follicular Fluid for Reliable Biomarkers of Human Oocyte and Embryo Developmental Competence	677
Jonathan Van Blerkom	
Index	687