
Contents

<i>Preface</i>	<i>vii</i>
<i>Contributors</i>	<i>xiii</i>

PART I SEMEN ANALYSIS METHODS

1 Methods for Sperm Concentration Determination.	3
<i>Lars Björndahl</i>	
2 Methods of Sperm Vitality Assessment	13
<i>Sergey I. Moskvovtsev and Clifford L. Librach</i>	
3 The Hypo-osmotic Swelling Test for Evaluation of Sperm Membrane Integrity	21
<i>Sivakumar Ramu and Rajasingam S. Jeyendran</i>	
4 Sperm Morphology Classification: A Rational Method for Schemes Adopted by the World Health Organization	27
<i>Susan A. Rothmann, Anna-Marie Bort, John Quigley, and Robin Pillow</i>	
5 Sperm Morphology Assessment Using Strict (Tygerberg) Criteria	39
<i>Roelof Menkveld</i>	
6 Methods for Direct and Indirect Antisperm Antibody Testing	51
<i>Hiroaki Shibahara and Junko Koriyama</i>	
7 Manual Methods for Sperm Motility Assessment	61
<i>David Mortimer and Sharon T. Mortimer</i>	
8 Computer-Aided Sperm Analysis (CASA) of Sperm Motility and Hyperactivation	77
<i>David Mortimer and Sharon T. Mortimer</i>	

PART II TESTS OF SPERM FUNCTION

9 The Hemizona Assay for Assessment of Sperm Function	91
<i>Sergio Oehninger, Mahmood Morshedi, and Daniel Franken</i>	
10 The Sperm Penetration Assay for the Assessment of Fertilization Capacity	103
<i>Kathleen Hwang and Dolores J. Lamb</i>	
11 Methods for the Assessment of Sperm Capacitation and Acrosome Reaction Excluding the Sperm Penetration Assay	113
<i>Christopher J. De Jonge and Christopher L.R. Barratt</i>	

PART III SPERM DNA DAMAGE TESTING

12	Sperm DNA Fragmentation Analysis Using the TUNEL Assay	121
	<i>Rakesh Sharma, Jayson Masaki, and Ashok Agarwal</i>	
13	Sperm DNA Damage Measured by Comet Assay	137
	<i>Luke Simon and Douglas T. Carrell</i>	
14	Sperm Chromatin Structure Assay (SCSA®)	147
	<i>Donald P. Evenson</i>	

PART IV ADVANCED CLINICAL TESTING

15	Sperm Aneuploidy Testing Using Fluorescence In Situ Hybridization	167
	<i>Benjamin R. Emery</i>	
16	Flow Cytometric Methods for Sperm Assessment	175
	<i>Vanessa Robles and Felipe Martinez-Pastor</i>	
17	Human Y Chromosome Microdeletion Analysis by PCR Multiplex Protocols Identifying only Clinically Relevant AZF Microdeletions	187
	<i>Peter H. Vogt and Ulrike Bender</i>	

PART V SPERM PREPARATION AND SELECTION TECHNIQUES

18	Sperm Cryopreservation Methods	209
	<i>Tiffany Justice and Greg Christensen</i>	
19	Density Gradient Separation of Sperm for Artificial Insemination	217
	<i>David Mortimer and Sharon T. Mortimer</i>	
20	Recovery, Isolation, Identification, and Preparation of Spermatozoa from Human Testis	227
	<i>Charles H. Muller and Erin R. Pagel</i>	
21	Enhancement of Sperm Motility Using Pentoxifylline and Platelet-Activating Factor	241
	<i>Shilo L. Archer and William E. Roudebush</i>	
22	Intracytoplasmic Morphology-Selected Sperm Injection	247
	<i>Luke Simon, Aaron Wilcox, and Douglas T. Carrell</i>	
23	Sperm Selection for ICSI Using Annexin V	257
	<i>Sonja Grunewald and Uwe Paasch</i>	
24	Sperm Selection for ICSI Using the Hyaluronic Acid Binding Assay	263
	<i>Mohammad Hossein Nasr-Esfahani and Tavalae Marziyeh</i>	
25	Sperm Selection Based on Electrostatic Charge	269
	<i>Luke Simon, Shao-qin Ge, and Douglas T. Carrell</i>	
26	Sex-Sorting Sperm Using Flow Cytometry/Cell Sorting	279
	<i>Duane L. Garner, K. Michael Evans, and George E. Seidel</i>	

PART VI STAGING AND HISTOLOGY TECHNIQUES

- 27 Assessment of Spermatogenesis Through Staging
of Seminiferous Tubules 299
Marvin L. Meistrich and Rex A. Hess
- 28 Immunohistochemical Approaches for the Study of Spermatogenesis. 309
Cathryn A. Hogarth and Michael D. Griswold
- 29 Ultrastructural Analysis of Testicular Tissue and Sperm
by Transmission and Scanning Electron Microscopy 321
Hector E. Chemes

PART VII OXIDATIVE STRESS TESTING

- 30 Assessment of Oxidative Stress in Sperm and Semen 351
Anthony H. Kashou, Rakesh Sharma, and Ashok Agarwal
- 31 Improved Chemiluminescence Assay for Measuring Antioxidant
Capacity of Seminal Plasma 363
Charles H. Muller, Tiffany K.Y. Lee, and Michalina A. Montaña

PART VIII ANALYTICAL TOOLS AND METHODS

- 32 Methods of Sperm DNA Extraction for Genetic and Epigenetic Studies 379
Jeanine Griffin
- 33 Isolating mRNA and Small Noncoding RNAs from Human Sperm 385
Robert J. Goodrich, Ester Anton, and Stephen A. Krawetz
- 34 A Review of Genome-Wide Approaches to Study the Genetic
Basis for Spermatogenic Defects 397
Kenneth I. Aston and Donald F. Conrad
- 35 Methods for the Analysis of the Sperm Proteome 411
Sara de Mateo, Josep Maria Estanyol, and Rafael Oliva

PART IX METHODOLOGIES TO EVALUATE SPERM EPIGENETICS

- 36 Methodology of Aniline Blue Staining of Chromatin and the Assessment
of the Associated Nuclear and Cytoplasmic Attributes in Human Sperm 425
Leyla Sati and Gabor Huszar
- 37 Isolation of Sperm Nuclei and Nuclear Matrices from the Mouse,
and Other Rodents 437
W. Steven Ward
- 38 Protamine Extraction and Analysis of Human Sperm
Protamine 1/Protamine 2 Ratio Using Acid Gel Electrophoresis. 445
Lihua Liu, Kenneth I. Aston, and Douglas T. Carrell

39	Analysis of Gene-Specific and Genome-Wide Sperm DNA Methylation	451
	<i>Saber Sue Hammoud, Bradley R. Cairns, and Douglas T. Carrell</i>	
40	Evaluating the Localization and DNA Binding Complexity of Histones in Mature Sperm	459
	<i>David Miller and Agnieszka Paradowska</i>	

PART X IN VITRO AND EX VIVO SPERMATOGENESIS MODELS

41	In Vitro Spermatogenesis Using an Organ Culture Technique.	479
	<i>Tetsuhiro Yokonishi, Takuya Sato, Kumiko Katagiri, and Takehiko Ogawa</i>	
42	Testicular Tissue Grafting and Male Germ Cell Transplantation.	489
	<i>Jose R. Rodriguez-Sosa, Lin Tang, and Ina Dobrinski</i>	

PART XI TRANSGENIC TECHNIQUES

43	Transgenic Modification of Spermatogonial Stem Cells Using Lentiviral Vectors	503
	<i>Christina Tenenhaus Dann</i>	
44	Methods for Sperm-Mediated Gene Transfer.	519
	<i>Marialuisa Lavitrano, Roberto Giovannoni, and Maria Grazia Cerrito</i>	
45	Phenotypic Assessment of Male Fertility Status in Transgenic Animal Models	531
	<i>David M. de Kretser and Liza O'Donnell</i>	
	<i>Index.</i>	549



<http://www.springer.com/978-1-62703-037-3>

Spermatogenesis

Methods and Protocols

Carrell, D.; Aston, K.I. (Eds.)

2013, XVII, 554 p., Hardcover

ISBN: 978-1-62703-037-3

A product of Humana Press