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*Editor*

# Atlas on the Human Testis

Normal Morphology  
and Pathology

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*To my wife, Vesna, and my sons, Bartol and Tadej, who have  
filled my life with love, joy, and happiness.  
To my parents, who inspired me to study medicine.*

*Davor Ježek*



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## Preface

In modern reproductive medicine, testicular biopsy is used for both diagnosing and treating the most difficult cases of male infertility, such as azoospermia. The correct interpretation of histologic findings related to the morphology of the testicular biopsy sample is crucial for therapeutic and in vitro fertilization procedures. The main method of treating obstructive and nonobstructive azoospermia is (micro) surgical and is aimed at successfully isolating spermatozoa from the biopsy specimen and microinjecting them into the oocyte. Therefore, a good knowledge of the normal development, morphology, and pathology of the human testis is the basis for managing infertility. Furthermore, early detection of carcinoma in situ and more advanced pathologic changes in the testicular parenchyma based on evaluation of the testicular biopsy sample leads to high cure rates of testicular neoplasms.

The aim of this atlas is to familiarize experts such as clinical embryologists, gynecologists, andrologists, urologists, pathologists, and other physicians/reproductive biology scientists with the normal morphology and pathology of the testis. Briefly, the atlas presents (a) methods of testicular tissue sampling; (b) various histologic procedures for tissue processing and freezing–thawing; (c) normal development of the early, fetal, and postnatal testis; (d) normal spermatogenesis and morphology of the interstitial tissue; (e) damage of spermatogenesis, cryptorchidism, Klinefelter’s syndrome, testicular dysgenesis syndrome, and detection of carcinoma in situ; (f) testicular neoplasms such as seminomas and nonseminomas; (g) other related pathology; and (h) new approaches to diagnosing male infertility, such as DNA microarray analysis and advanced microscopic techniques.

This atlas might guide experts in the reproductive medicine field toward the correct interpretation of histologic findings and standardization of testicular biopsy analysis/procedures in their laboratories. The book presents images from paraffin and semithin sections of the human testis; such sections are used routinely to assess testicular tissue morphology.

Many people sacrificed their time and energy to contribute to this book. Therefore, I am deeply grateful to the authors and coauthors of all chapters. Without the valuable help of my young assistants, Andreja Vukasović and Viviana Kozina, and their schematic representations, it would be impossible for me to finalize some chapters and submit them to the publisher. I am indebted to the Springer crew, especially our developmental editor, Georgette Forgione, for the continuous support and encouragement. Finally, without the



understanding of my wife and family during the many nights I spent amending pictures and writing text and legends, this book would not have become a reality.

Davor Ježek

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# Contents

<b>1 “Open” Biopsy of the Testis and Testicular Sperm Extraction</b> . . . . .	1
Ivan Krhen, Andreja Vukasović, and Davor Ježek	
<b>2 MicroTESE and Embryo Development</b> . . . . .	7
Nikica Zaninović and Peter N. Schlegel	
<b>3 Histologic Procedures and Testicular Biopsy Freezing</b> . . . . .	23
Andreja Vukasović, Viviana Kozina, and Davor Ježek	
<b>4 Early Development of the Human Testis</b> . . . . .	37
Gordana Jurić-Lekić, Marta Himmelreich, Marta Lekić, Đurđica Grbeša, and Floriana Bulić-Jakuš	
<b>5 The Fetal Human Testis</b> . . . . .	55
Marina Kos and Tanja Leniček	
<b>6 The Testis in Childhood Between Birth and Puberty</b> . . . . .	69
Ewa Rajpert-De Meyts, Kristian Almstrup, John E. Nielsen, and Niels E. Skakkebæk	
<b>7 Normal Morphology of the Human Testis and Epididymis</b> . . . . .	77
Davor Ježek, Viviana Kozina, and Andreja Vukasović	
<b>8 Damage of Spermatogenesis</b> . . . . .	99
Martin Bergmann and Davor Ježek	
<b>9 Inflammatory Conditions of the Testis</b> . . . . .	113
Hans-Christian Schuppe and Martin Bergmann	
<b>10 Cryptorchidism (Undescended Testis)</b> . . . . .	123
Ljerka Banek, Viviana Kozina, Iva Marolt, and Tomislav Banek	
<b>11 Klinefelter’s Syndrome</b> . . . . .	147
Manuel Nistal and Pilar González-Peramato	
<b>12 Testicular Dysgenesis Syndrome and Carcinoma In Situ Testis</b> . . . . .	159
Ewa Rajpert-De Meyts, Kristian Almstrup, and Niels E. Skakkebæk	