Preface

The compiling of this book was taken up to create a reference book for readers interested in mammalian endocrinology and male reproductive biology. This discipline has witnessed considerable progress over the past several years. Keeping this in view, an attempt has been made to provide up-to-date information on the recent developments in this field. Unlike a book written by a single author, this book is the result of a multiauthor effort and provides comprehensive systematic coverage of topics in mammalian endocrinology and male reproductive biology.

There are 12 chapters in this book. Chapter 1 reviews the evidence for sexual dimorphism in the central nervous system and considers the mechanisms by which this is brought about. Chapter 2 on mammalian gonadotropin-releasing hormone (GnRH) presents an account of its structure, control of release and potential functions. Chapter 3 on gonadotropins – past, present and future – provides a coherent view of gonadotropins of pituitary origin and their role in the regulation of gonadal functions. In this chapter, selected topics concerning pituitary protein hormones and their influence on gonadal processes are discussed, and these include their purification, structural highlights, microheterogeneity, *in vivo* and *in vitro* bioassay, regulation of biosynthesis and secretion, their receptors in gonadal tissue, and clinical usage. Chapter 4 presents an account of endocrine regulation of spermatogenesis. This chapter illustrates how hormones of the hypothalamo–pituitary–gonadal axis regulate the process of spermatogenesis. Chapter 5 discusses the role of apoptosis in spermatogenesis and highlights the signal transduction pathways involved in apoptosis of germ cells in the testis. Chapter 6 provides a detailed account of structure and function of the epididymis, which plays a major role in physiological maturation of spermatozoa, and this maturation process is a prerequisite for the sperm to acquire the ability to be motile and to fertilise the oocyte. Chapter 7 deals with regulation of growth and function of epididymides. Hormones such as follicle-stimulating hormone (FSH), androgen and oestrogen are known to play role in regulation of epididymal growth and function, so their role in this regulation is discussed. Chapter 8 describes sperm forward motility initiating and regulating molecules located on surface of sperm cell in the epididymis. The authors have focussed on the sperm cell surface molecules with special reference to external domain. In Chapter 9, structure and function of the male accessory sex glands are

described. The major male accessory sex glands are the seminal vesicles, prostate glands and Cowper's glands, and this chapter provides details of their structure and function, with associated pathologies. Chapter 10 focuses on recent advances in male contraception along with a resume of the male reproductive processes and male reproductive endocrinology, which form the basis for the development of male-based contraceptive regimens. Chapter 11 describes molecular mechanism of androgen action. In this article, the author has reviewed current progress in understanding the molecular mechanism of androgen action with emphasis on coregulators and their role in physiology and pathology, particularly with a focus on the brain. Finally, Chapter 12 deals with genomics of male infertility. It is well to remember that infertility due to male factor contributes approximately 50% of the infertility cases in humans. A number of autosomal as well as sex chromosomal genes have been identified that are believed to play a pivotal role in the production of viable, normal and functional sperm. In this chapter, the authors discuss diverse aspects of male infertility and the role of genome.

There are inevitably some overlaps, but these are essential for flow and clarity of the subject matter, and efforts have been made to restrict these to the minimum. The chapters have been written by authors who are acknowledged leaders in their respective fields. I wish to express my personal gratitude to all of them for their valuable contribution and overwhelming support and encouragement. This book could not have been completed without their fullest cooperation. My thanks are also due to my research students for their help, and I wish to record my special appreciation to Ms. Deepanshu Joshi for her invaluable help in many ways. I will be failing in my duty if I do not acknowledge my wife for the sustained support in her own way.

Thanks are also due to colleagues at CRC Press/Taylor & Francis, especially to Dr. Chuck Crumly, Hayley Ruggieri and Amanda Parida for their efforts in ensuring the successful publication of this book.

Finally, I accomplished this task with the Holy Blessings of my Gurumaa and Gurudev. I hope this book will be useful to all those interested in the area of mammalian endocrinology and male reproductive biology be they students, teachers or researchers.

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