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## Biology of spermatogenesis

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Spermatogenesis is one of the most complex, yet fascinating, cellular events take place in the testis of all species, from flies and worms to humans. The complexity of spermatogenesis can be easily appreciated when we compare the weight of the testis with its extraordinary cellular output. For example, a pair of testis in the rat or human weighs ~3- or ~40-g, but it produces an upward of 50 or 400 million spermatozoa per day by age 45-day or ~12-year, respectively. Furthermore, this output is maintained throughout adulthood, illustrating that there is a complex, yet highly efficient, system in place in the testis to produce such a vast number of spermatozoa by spermatogenesis. Surprisingly, the biology of mammalian spermatogenesis, except for the morphological studies that were performed decades ago, remains largely unexplored until the past decade or two. This exponential growth in the pace of understanding spermatogenesis in recent years is largely due to advances in genomics, proteomics, and genetics, as well as in technological breakthroughs in cell and molecular biology, and biochemistry. For instance, we now have more than 500 mouse models for male fertility or infertility research, illustrating that spermatogenesis is regulated by an array of genes and their products. This vast volume of data, coupled with unprecedented advances in technology, has paved the way for cutting-edge research; however, much work remains to be done. There is an urgent need to better understand the biology of spermatogenesis because infertility is an emerging disease that affects more people right behind cancer and cardiovascular diseases. For instance, about 15% of married couples are infertile in both developed and developing countries. Of these infertility cases, ~30% are due to male factors, such as a disruption of spermatogenesis that leads to non-obstructive azoospermia.

Approximately two years ago, I conceived the idea of assembling a Special Issue entitled: "Biology of Spermatogenesis". The goal was to enlist the leading investigators in the field to discuss the latest findings in their respective fields. I attempted to cover the entire spectrum of research on the biology of spermatogenesis. It was also my intention that this Special Issue would serve as a platform to further energize the field, and to act as the bait to attract young investigators, who are currently at the crossroads of choosing a career path, to pursue a career in studying spermatogenesis. I am thankful to all of the senior investigators who have worked unselfishly for this Special Issue during the past two years, amidst their busy schedules. I am delighted that each of the articles in this Special Issue provides the latest research findings and thought-provoking concepts. I am particularly grateful to Dr. John Davey, the Editor-in-Chief, for his support and enthusiasm on this topic. I am also indebted to Ms. Nalini Kannan and Ms. Hogleh Dasari, Journal Managers at Elsevier, for their unyielding and professional support in handling these manuscripts. It is my hope that this Special Issue will be a valuable reference work for investigators in the years to come.