

## INTRODUCTION

Reproduction is a complex process requiring exquisite integration of signals along the hypothalamic–pituitary–gonadal axis in both sexes. To be successful, functional gametes must be produced, matured, released, and transported effectively. Specific behavioral repertoires also must be executed precisely to ensure efficient mating and fertilization. Our current state of knowledge about the physiological, biochemical, and molecular orchestration of reproduction is captured in many excellent reference volumes [1–5]. Based on this understanding, male reproductive function would be expected to be impacted by chemicals that act through a variety of mechanisms, including disruption of the spermatogenic cycle in dividing cells (spermatogonia) as well as those undergoing meiotic processes (spermatocytes); damage to DNA, especially during DNA repair-deficient stages (condensed spermatids); and interference with a vast array of endocrine and paracrine signaling pathways vital to the regulation and integration of reproductive function.

Much of the today's research in reproductive biology is motivated by the widely recognized need to understand both fertility and infertility in humans and wildlife so as to develop effective technologies for both contraception and treatment of infertility. Studying the extent to which industrial chemicals in the environment or therapeutic drugs may alter reproduction serves to facilitate our understanding of reproductive biology. Such understanding is essential if protective actions by regulatory agencies are to be based on sound science. The goal of this chapter is to summarize how information on the potential for chemicals to interfere with male reproductive capability is obtained and used by regulatory agencies, industry, and others.