

Where Do Babies Come From?

This is a question parents inevitably hear from their children. It's hard enough to find an answer that will satisfy a 4-year-old, much less a reproductive biologist. Understanding the basic biology of reproduction, researchers hope, will guide treatments for infertility, pregnancy-related disorders, and diseases of the reproductive tract, as well as aid in the development of contraceptives, hormone replacements, and methods for assisted reproductive technology (ART).

This reproductive biology special issue assembles articles from several active areas of research. Brinster (p. 2174) describes male germ-cell transplantation, a method that can be used in the study of stem cell biology and infertility and in transgenesis. Sassone-Corsi (p. 2176) illustrates the special case of male germ-cell gene expression and how this mechanism differs from

that seen in all the other cells of the body. Matzuk *et al.* (p. 2178) shift attention to the female germ cell and describe the communication between the oocyte and surrounding somatic cells. In order to contribute the appropriate chromosomal complement, germ cells undergo meiosis. Hunt and Hassold (p. 2181) explain sexual dimorphism in meiotic disruption and its consequences.

Once germ cells are fully differentiated, fertilization can take place. Primakoff and Myles (p. 2183) outline the fertilization process. After egg and sperm fusion, a blastocyst develops; Paria *et al.* (p. 2185) describe the molecular events of its implantation. When normal fertilization is impeded, couples often turn to ART. Schultz and Williams

(p. 2188) outline recent advances but also warn that basic science must be applied to make protocols safer and more effective. In a related Editorial, Braude (p. 2101) cautions that the success of ART should not be measured only in terms of live births; the health of the children must be considered.

Reproduction is a perilous process. In the News section, Jon Cohen (p. 2164) examines the most common cause of miscarriage—aneuploidy—and describes some of the latest techniques aimed at addressing the problem. Even successful pregnancies can leave babies at risk of certain diseases; Jennifer Couzin (p. 2167) reports that disruptions in a fetus's environment can reverberate 50 years later in a propensity for heart disease and other adult ailments. Likewise, some of the physical costs of bearing a child aren't apparent for decades. Marcia Barinaga (p. 2169) explores microchimerism: Cells exchanged during pregnancy can live on indefinitely in the mother and child, spurring autoimmune and other diseases. Those who choose not to reproduce are mostly stuck with contraceptive methods that have been around for a generation; Constance Holden (p. 2172) finds that few new strategies are being researched, despite a growing need for appropriate contraceptives, particularly in the developing world.

It is unlikely that we will come up with a satisfactory answer to the 4-year-old's question of where babies come from, for any response is sure to be followed by, "But why?" Similarly, as each hypothesis about reproduction is tested, new questions spring to mind.

—BEVERLY PURNELL AND LAURA HELMUTH



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