Sperm Cells Encyclopedia Article

Sperm Cells

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Sperm Cells

Sperm cells are **haploid** sex cells of the male. They are also known as spermatozoa. Unlike eggs which are large, non-motile, and generally few in number, sperm are tiny, motile, and produced in huge numbers. While the human sperm length (0.002 in [600 cm]) is relatively great due to its long tail, the volume of an entire sperm, tail and all, is only 1/85,000 of the egg.

Reproduction in humans occurs when the sperm are deposited in the vagina of a female near the cervical opening of the uterus. The haploid sperm move into the uterus and up the Fallopian (uterine) tube where an egg may be encountered. With **fertilization**, the egg finishes its second meiotic division to become haploid. The haploid sperm and mature egg together form a **diploid zygote** which is the beginning of a new individual.

The male gonad (testis singular, testes plural; testicle is derived from the diminutive of testis and perhaps is best used to describe the gonads of a sexually immature boy) produces the hormone testosterone and sex cells. Early in embryonic development, primordial germ cells, which are diploid, migrate to the embryonic gonad. The primordial germ cells give rise to the diploid **stem cells** of the testis, known as spermatogonia. Each of the many spermatogonia, after the first meiotic division, form two primary spermatocytes which in turn, after the second meiotic division, form four haploid spermatids. In the process of forming mature sperm the spermatids lose much of their cytoplasm and develop a long, propulsive tail.

Motility of the sperm is due to the long tail which is a modified flagellum. Cilia and flagella, from protozoa through humans, all have a basically similar structure which has been intensively investigated since first described in early **electron microscope** studies. Microtubules that run the length of the sperm tail are arranged in a ring of nine pairs surrounding a pair in the center. Ciliary dynein is associated with each of the nine microtubule pairs. It is the interaction of the dynein with the microtubules which causes flagellar bending and thus propulsion.

As stated, sperm occur in large numbers. It is estimated that a quarter of a billion sperm are released in a single ejaculate in a healthy male human.