

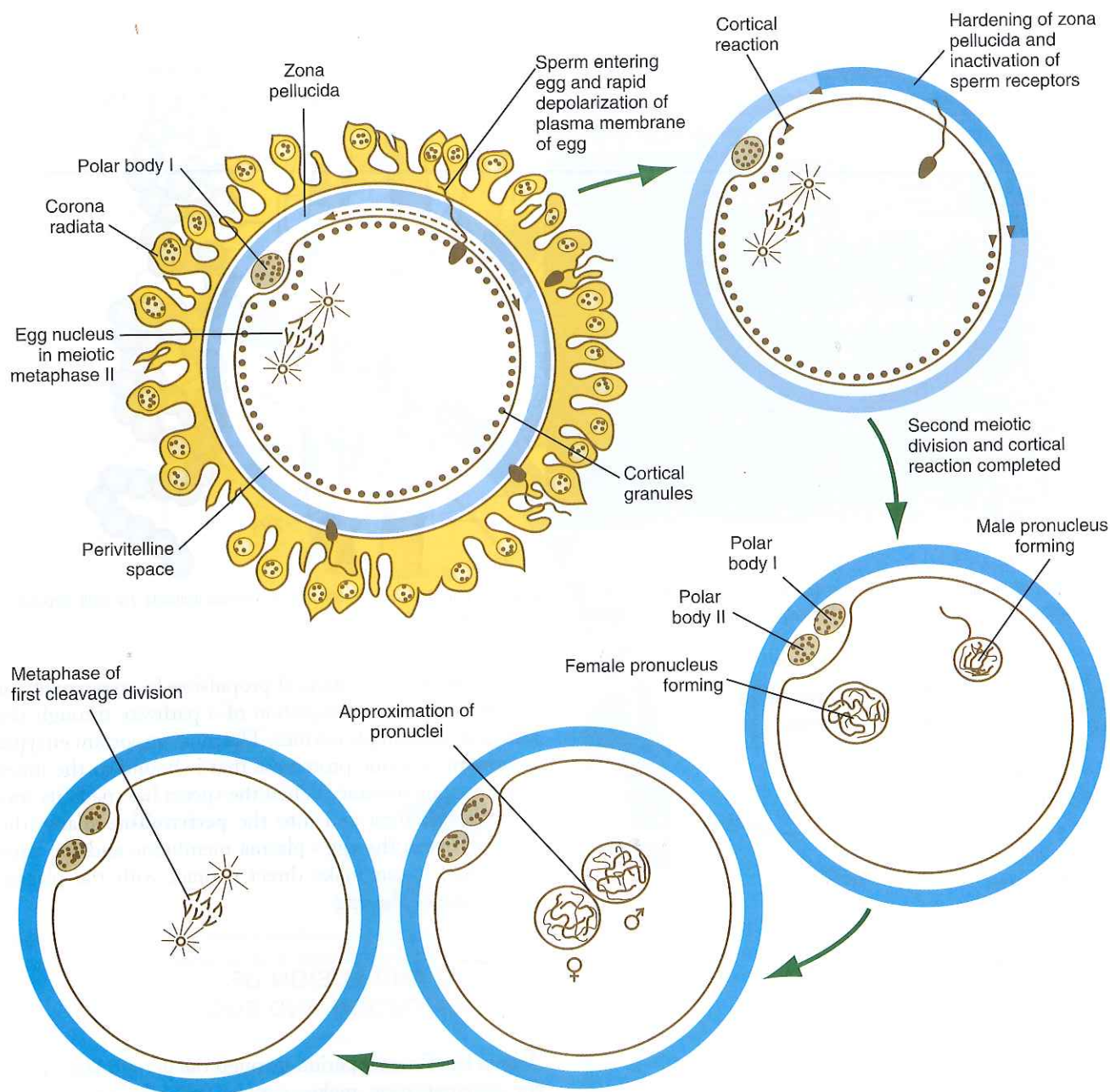


FIGURE 2-6. Summary of the main events involved in fertilization.

becomes incorporated into the egg's plasma membrane and remains recognizable at least until the start of cleavage. Although mitochondria located in the sperm neck enter the egg, they do not contribute to the functional mitochondrial complement of the zygote. In contrast, in humans, the sperm contributes to the zygote the centrosome, which is required for cell cleavage.

PREVENTION OF POLYSPERMY

When a spermatozoon has fused with an egg, the entry of other spermatozoa into the egg (**polyspermy**) must be prevented, or abnormal development is likely to result.

Two blocks to polyspermy, fast and slow, are typically present in vertebrate fertilization.

The **fast block to polyspermy**, which has been best studied in sea urchins, consists of a rapid electrical depolarization of the plasma membrane of the egg. The resting membrane potential of the egg changes from about -70 mV to $+10$ mV within 2 to 3 seconds after fusion of the spermatozoon with the egg. This change in membrane potential prevents other spermatozoa from adhering to the egg's plasma membrane. The fast block in mammals is short-lived, lasting only several minutes, and may not be as heavily based on membrane depolarization as that in sea urchins. This time is sufficient for the egg to mount a permanent slow block. The exact