

## The Role of Polar Body in the Female Gamete

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**Abstract :** Polar bodies are cells that form by oogenesis in meiosis which differentiate and develop from oocytes. Although in many animals, these cells often die following meiotic maturation of the oocyte. Oocyte activation is during mammalian fertilization, sperm is fused with the oocyte's membrane, triggering the resumption of meiosis from the metaphase II arrest, the extrusion of the second polar body, and the exocytosis of cortical granules. The origin recognition complex proteins 4 (ORC4) forms a cage around the set of chromosomes that will be extruded during polar body formation before it binds to the chromatin shortly before zygotic DNA replication. One unique feature of the female gamete is that the polar bodies can provide beneficial information about the genetic background of the oocyte without potentially destroying it. Testing at the polar body (PB) stage was the least accurate, mainly due to the high incidence of post-zygotic events. On the other hand, the results from PB1-MII oocyte pair validated that PB1 contains nearly the same methylome (average Pearson correlation is 0.92) with sibling MII oocyte. In this article, we comprehensively examine the role of polar bodies in female human gametes.

**Keywords :** polar bodies, ORC4, oocyte, genetic, methylome, gamete, female

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