Polarisation of the oocyte relies on complex interactions between the germline and the somatic epithelium (follicle cells) surrounding the germline. This epithelium needs to pattern and adopt the precise fates for the final "signalling" towards the oocyte:

- Oocyte secreted gurken (TGFa)
- Follicle cells need Notch pathway, Hippo pathway, EGF receptor (Gurken receptor)
- Unknown form of signalling from follicle cells back to oocyte

The follicle cells at the posterior adopt the posterior fate. A signal is thought to be sent from these posterior cells to the oocyte, resulting in its repolarisation. Thus results in the migration of the oocyte nucleus from the posterior to the anterior-dorsal corner, and reorganisation of the microtubule cytoskeleton. Par proteins are somehow involve in this process, mirroring processes in C. elegans (in which Par proteins were discovered). For example, in Par-1 mutants, symmetry is not broken in both Drosophila and C. elegans oocytes.

Symmetry-breaking event in the germarium at the very anterior region of the ovariole: depends on selective adhesion (by E-cadherin).

Summary:

1. The initiation of AP differences/symmetry breaking is controlled by interactions between the egg and its surrounding follicle cells
2. The MT network reorganises with the minus and plus ends at the anterior and posterior respectively
3. Maternal effect genes bicoid and oskar are expressed and localised to opposite poles of the cell, anterior and posterior respectively. Oskar is translated and the proteins recruits nanos
4. Biocoid and hunchback regulate the production of anterior structures while Nanos and Caudal regulate the production of posterior structures
5. The proteins activate or repress the zygotic gap genes to define the broad territories of the embryo
6. Differing concentrations of the gap gene proteins causes the transcription of the pair rule genes which divides the embryo up into 14 parasegments
7. The pair rule genes activate the segment polarity genes (during gastrulation), and the products of the gap, pair rule and segment polarity genes interact to regulate the homeotic selector genes which define the developmental fate of each segment