# *Developmental Biology assignment*

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nucleus of of the egg and results in the formation of zygote. The resulting zygote contains all the chromosomes needed for a new individual.half the chromosomes are from the egg and half are from the sperm.

The stages of fertilization can be divided into four process

*Sperm preparation

*Sperm egg recognition and binding

*Sperm-egg fusion

*Fusion of sperm and egg pronuclei and activation of the zygote

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**The Four Stages of Fertilization:**

**Step I. Preparation of the Sperm.**

Ejaculated sperm are not ready to fertilize an egg when they enter the vagina. In response to the dilution of semen in the vagina, they undergo several changes, which are collectively known as *capacitation*.

the fusion of the acrosomal vesicle with the sperm plasma membrane (an exocytosis that results in the release of the contents of the acrosomal vesicle) and the extension of the acrosomal process. The acrosomal reaction in sea urchins is initiated by contact of the sperm with the egg jelly. Contact with egg jelly causes the exocytosis of the sperm's acrosomal vesicle and the release of proteolytic enzymes that can digest a path through the jelly coat to the egg surface.

**11)Species-specific recognition in sea urchins:**

Once the sea urchin sperm has penetrated the egg jelly, the acrosomal process of the sperm contacts the surface of the egg. A major species-specific recognition step occurs at this point. The acrosomal protein mediating this recognition is called bindin. In 1977, Vacquier and co-workers isolated this nonsoluble 30,500-Da protein from the acrosome of *Strongylocentrotus purpuratus* and found it to be capable of binding to dejellied eggs of the same species. Further, its interaction with eggs is relatively species-specific bindin isolated from the acrosomes of *S. purpuratus* binds to its own dejellied

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