

Abstract

Sexual reproduction ensures spread of almost every animal species. Two morphologically very different cells, which develop exclusively in males or females, play role in the formation of new and genetically different organism. In mammals, these two haploid cells, the sperm and the egg, meet in the female reproductive tract. After the interaction, they fuse and later become the diploid cell. Based on *in vitro* fertilization, this process has been well described, but molecular details and especially receptor proteins remain the subject of scientific research.

Determining the molecular mechanisms important for the sperm-egg membrane interaction, including the binding and fusion, is a major challenge for current reproductive biology with a significant importance on animal and human reproductive programmes. So far, many proteins have been selected to be fusion candidates, some of them (IZUMO1, CD9, JUNO) were proven to be essential, whereas others were discovered to play an unsuspected new active role (CD46, tetraspanins). The individual and complex proteins' and receptors' interactions are the key for understanding the fertilization process and its sub-steps. Removing the gene function for individual proteins confirms their irreplaceability in adhesion and fusion.

Keywords:

Sperm, egg, IZUMO1, CD9, JUNO, ADAM, tetraspanin web, gametes interaction