

Abstract:

In order to fertilize the egg, sperm cell undergoes several subsequent maturation processes. The final one called acrosome reaction is an exocytosis of acrosome vesicle, which is filled with lytic enzymes. Acrosome reaction is crucial for penetration of the sperm cell through the egg surroundings, especially *zona pellucida*, as well as for reorganization of a membrane protein composition on its surface. This rearrangement leads to the exposure of proteins essential for fertilization, mainly for gamete recognition, binding and fusion in specific compartments of the sperm head. One of such protein is CD46, which is located in the acrosomal membrane of an intact sperm and after acrosomal exocytosis it relocates to the equatorial segment of a sperm head, which is known to be the initial site of interaction of sperm with the egg plasma membrane. The relocation of CD46 is disrupted by inhibition of actin, which reorganization within sperm head is known to play a role in onset of acrosome reaction, however, the precise mechanism of CD46 interaction with actin in sperm is unknown. In this thesis, ezrin – a crosslinker of membrane proteins and actin – has been studied in context of CD46 and its relocation across the sperm head. Analysis of the immunofluorescent detection of ezrin revealed its mutual localization with CD46, which is disrupted during acrosome reaction. The presence of ezrin in intact and acrosome-reacted sperm was confirmed by western blot experiments. In addition, the interaction of CD46 and ezrin was detected by co-immunoprecipitation. Based on these findings, we propose that CD46 interaction with actin is mediated by ezrin in mouse sperm.

Keywords: acrosome reaction, ezrin, CD46, actin, sperm