

## **Molecular mechanisms of sperm behaviour prior to fertilization in selected species of family *Muridae***

Capacitation is very important event, which is pre-requisite prior to mammalian sperm can acrosome react (AR) and fertilize the oocyte. Many signal pathways are involved in capacitation and AR, and tyrosine protein phosphorylation is one of the key events. For this reason, we studied change of protein tyrosine phosphorylation pattern during capacitation *in vitro*.

Actin as the main component of microfilament and spectrin as the actin-binding protein play a very important role in mammalian cells. Both are also present in mammalian spermatozoa. In sperm head, actin is present in the cortical cytoskeleton, equatorial segment, perinuclear theca, post-acrosomal segment and neck. The localization of spectrin in mammalian sperm head is similar to that of actin. The interaction between actin and spectrin is described in somatic cells, however not yet in sperm, the unique and specialized germinal cells.

CD46 (MCP; membrane cofactor protein) is expressed in the mammalian sperm head. In man, however, CD46 is also a widely expressed as cell surface complement regulatory protein. Antibodies to the first short consensus repeat (SCR 1) ectodomain of CD46 inhibit binding and penetration of zona-free eggs by human sperm. The importance of the SCR1 domain is supported by its selective expression in spermatozoal CD46 of New World monkeys. In contrast, CD46 in rodents is solely expressed on the acrosomal membrane, and becomes surface exposed only after the AR. Surprisingly CD46 knockout mice are fertile and have an accelerated spontaneous AR rate. In this work we used a spectrum of monoclonal and polyclonal anti CD46 antibodies to tested expression CD46 on sperm in selected species of mammals especially rodents. Sperm were capacitated and the comparative rate of accelerated AR among selected rodent species was examined by PNA lectin.

**Key words:** sperm, capacitation, acrosome reaction, tyrosine phosphorylation, actin, spectrin, CD46