Abstract

Focusing on understanding the mechanisms of sperm-egg interaction in mammals is crucial for understanding the mysteries of reproduction and fertilization. The analysis of key phases of these processes involves the study of chemical signals and proteins that influence the mutual attraction of sperm and egg, and subsequently allow the successful fusion of these two cells. This thesis aims to analyze the methods used to study these interactions, with an emphasis on emphasizing the involvement of proteins such as tetraspanins, fertilins, MAIA, and others playing a role in the interaction or fusion of gametes. Methods used to study gamete interaction include imaging techniques such as microscopy and fluorescent labeling, biochemical analyses, and more recently, advanced methods such as genetic manipulation. Choosing the right method to identify and characterize the key proteins engaging in sperm-egg interaction is critical for understanding the molecular mechanisms behind the fertilization process. This work focuses on a review of modern methodologies that allow to investigation of the complex interactions between sperm and egg at the molecular level, mainly methods used to prepare genetically modified organisms or methods that block the binding between gametes. Studying sperm-egg interactions in mammals is crucial because these findings expand our understanding of reproductive biology and open perspectives for potential fertility treatments and improvements in reproductive technologies.

Keywords: sperm, oocyte, fertilization, GMO, binding blocking