The role of acrosin in reproduction

Karim Nayernia [1], Ibrahim Adham (Ph.D.)[2],Rahman Shamsedin(Ph.D.)[3], Wolfgang Engel(Ph.D.)[4]

1- Associate Professor, Department of Genetics, Biotechnology Embryology, Avesina Research Center,Teheran, Iran.
2- Associate Professor of Institute of Human Genetics, University of Gothingen, Gothingen, Germany
3- Assistant Professor of Institute of Human Genetics, University of Gothingen, Gothingen, Germany
4- Professor of Institute of Human Genetics, University of Gothingen, Gothingen, Germany

Abstract

Acrosin, an endoprotease with trypsin-like substrate specificity, is localized in the acrosomal matrix as an enzymatically inactive zymogen, proacrosin, that is then converted into the active form as a consequence of the acrosome reaction.
The physiological role of acrosin in fertilization has long been believed to be the limited proteolysis of the zona pellucida. Using homologous recombination, we have previously successfully produced male mice carrying a disruptive mutation in the acrosin gene and found that the mouse sperm lacking acrosin protease activity still penetrate zona pellucida and normally fertilize the egg .These Results provide evidence, that acrosin is not essential for sperm penetration of the zona pellucida. However, mouse sperm lacking acrosin showed a delay in penetration of the zona pellucida solely at the early stage after insemination .To elucidate the role of acrosin in fertilization, we have examined the involvement of acrosin in fertilization of zona pellucida after hardening and agining. We used DMSO for the hardening of zona pellucida. We observed that sperm lacking acrosin showed a reduced fertilitzation of eggs after zona pellucida hardening and aging. These data suggest the role of acrosin in combined infertility, which male and female factors are involved

Keywords: Acrosin, Gene targeting, Combined infertility, Acrosome reaction.
Corresponding address: Avesina Research Center, Shahid Beheshti University, Evine, P.O.BOX:19835-177, Tehran, Iran.