

Role of Egg Sulfolipidimmobilizing Protein 1 on Mouse Sperm-Egg Plasma Membrane Binding

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ABSTRACT

We have shown that sperm sulfolipidimmobilizing protein 1 (SLIP1, molecular mass of 68 kDa), a sulfogalactosylglycerolipid (SGG)-binding protein, is significant in sperm-zona pellucida (ZP) interaction. The objective of this study was to localize SLIP1 on the egg and determine its role in gamete interaction. Immunofluorescence and immunoprotein A gold electron microscopy localized SLIP1 to the egg plasma membrane. In vitro gamete binding, using zona-free eggs preincubated with anti SLIP1 Fab before coincubation with sperm, showed a significant, dose dependent decrease in sperm-egg plasma membrane binding. Similar results were obtained when affinity-purified anti SLIP1 IgG was used for egg pretreatment. The

significance of egg SLIP1 in sperm-egg plasma membrane binding was further demonstrated by a decrease (36-52%) in in vitro fertilization when zonaintact eggs were pretreated with anti SLIP1 IgG. Since SLIP1 has been shown to bind SGG in vitro, we investigated the possibility that sperm SGG may participate in sperm-egg plasma membrane binding through egg SLIP1. Pretreatment of sperm with antiSGG Fab prior to coincubation with zona-free eggs resulted in a dose dependent decrease in sperm-egg plasma membrane binding. Collectively, these findings strongly suggest a role for egg SLIP1 in sperm-egg plasma membrane interaction, which may be through its binding to sperm SGG.

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