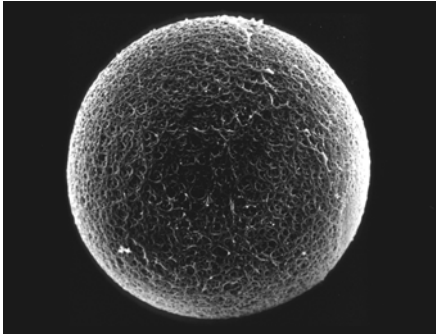


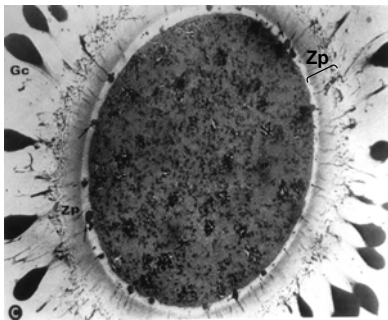
The Egg



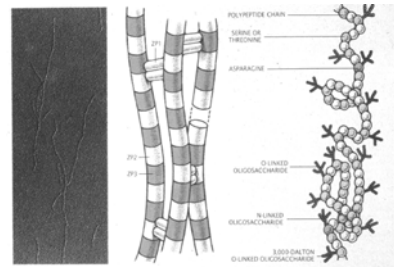
Egg Microvilli



Zona Pellucida

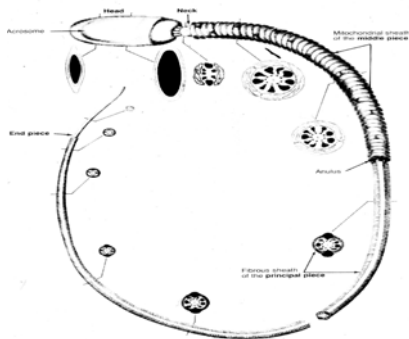


Zona Pellucida Glycoproteins



MOLECULE KNOWN AS ZP3 is a major component of the filaments that form the zona pellucida. It is a glycoprotein, a polypeptide to which sugar groups are attached. It combines with another glycoprotein, ZP4, to form the basic building block of the filaments, which are shown highly schematically at the center. A third glycoprotein, ZP2, links the filaments. ZP4, shown in detail at the right, is the receptor molecule that binds sperm. It also induces the acrosome reaction. The actual binding elements are a subset of the ring of chains radiating from ZP4's polypeptide backbone. They are the ribbed oligosaccharides (those attached to the amino acids serine and threonine) with a molecular weight of about 5000 daltons. The same sugar chains appear to collaborate with the polypeptide in ZP4 to induce the acrosome reaction.

The Sperm



Axonemes and Sliding Microtubules

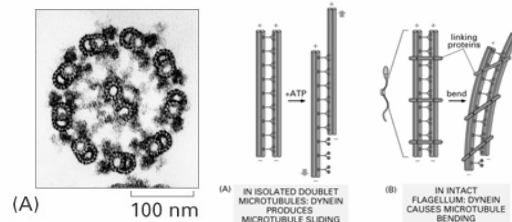
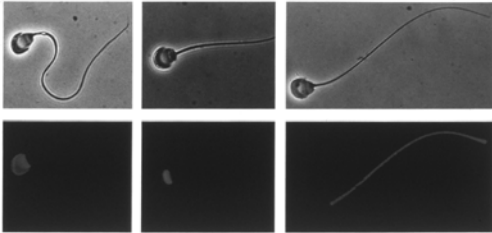


Figure 17-24 Essential Cell Biology, 5th, © 2004 Garland Science

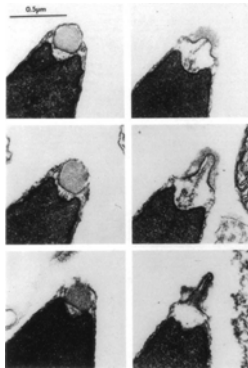
Sperm Surface Asymmetry



Sea Urchins

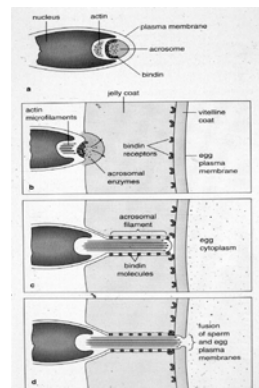


Sea Urchin Acrosome Reaction

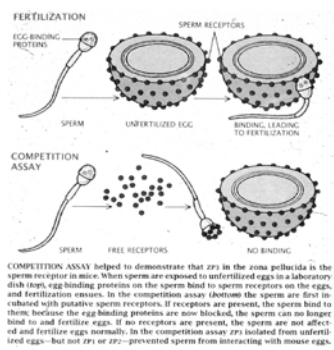


Sea Urchin Fertilization

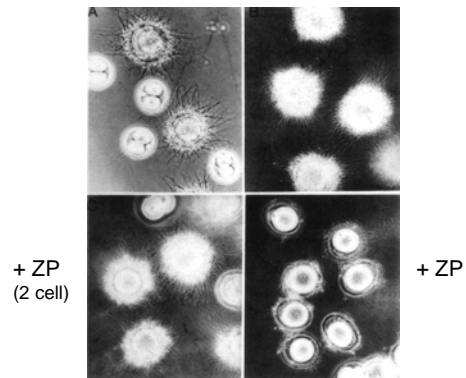
Direct Binding of Sperm to Egg



Competition Assay to Identify Egg Receptor



Isolated Zona Pellucida Blocks Sperm Binding



Isolated ZP3 Blocks Sperm Binding

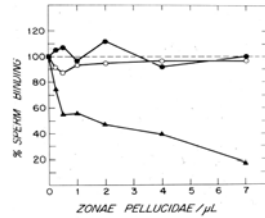
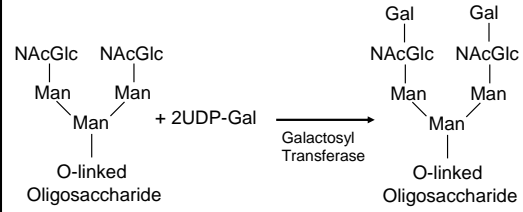
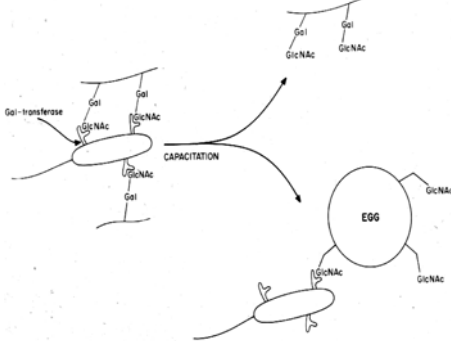


Figure 5. Quantitation of Binding of Sperm to Eggs in the Presence of Various Concentrations of Zona Pellucida Proteins Purified from Zona Pellucida Isolated from Unfertilized Eggs. These experiments were carried out as described in the legends to Figures 1 and 2 using purified ZP1 (■), ZP2 (□) and ZP3 (▲) from zona pellucida isolated from unfertilized eggs. There were an average of 50 sperm bound per egg at the 100% binding level (■) and, in each case, a minimum of eight eggs were examined and included in the calculations.

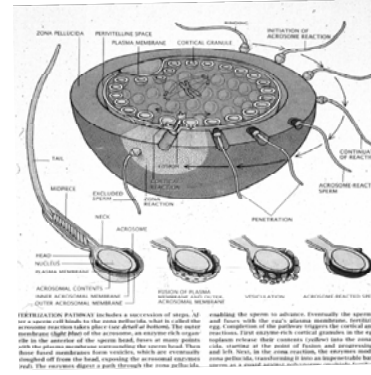
Galactosyl Transferase



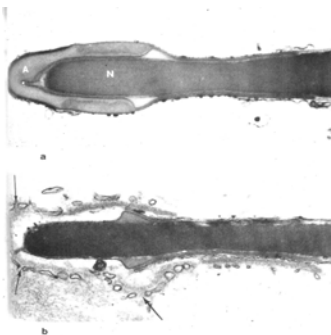
Role of Galactosyl Transferase in Binding to Egg



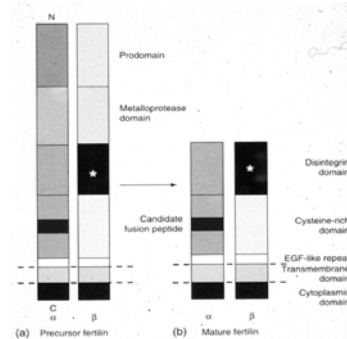
Acrosome Reaction & Penetration of Zona Pellucida



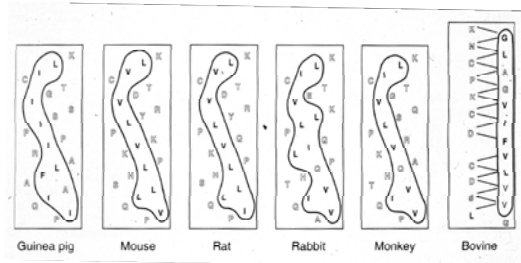
Vesiculation of Acrosome



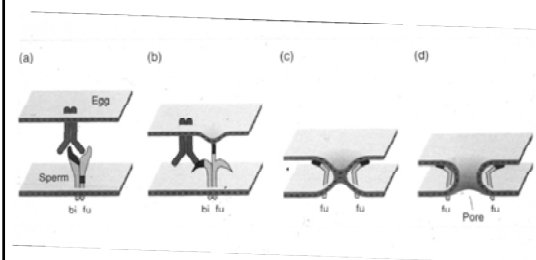
Fertilins and ADAMs family proteins



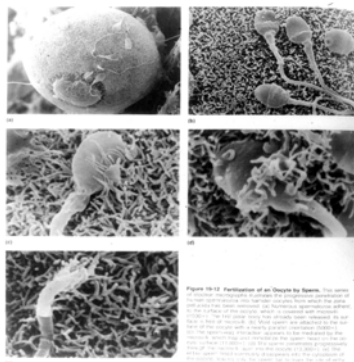
Fertilin- α hydrophobic domain



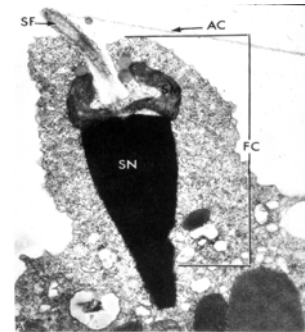
Model for Fertilin Function During Fertilization



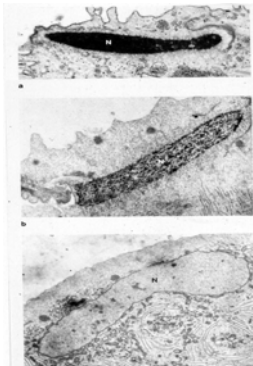
Incorporation of Sperm Into Egg – Role of Microvilli



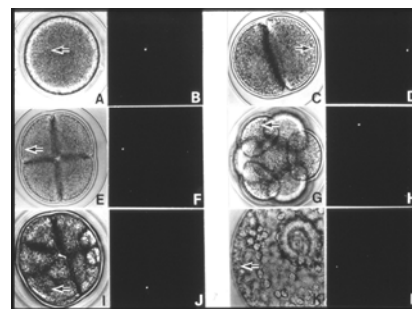
Incorporation of Sperm Components Into Egg



Formation of Sperm Pronucleus



Persistence of Sperm Mitochondria In Embryos



Propagation of Calcium "Wave"

