

MECHANISMS OF EGG ACTIVATION

Edited by

Richard Nuccitelli

University of California, Davis
Davis, California

and

Gary N. Cherr and

Wallis H. Clark, Jr.

Bodega Marine Laboratory
University of California, Davis
Bodega Bay, California

Plenum Press • New York and London

CONTENTS

Introduction	xiii
An Autobiographical Sketch Edward L. Chambers	xv
I. Electrical Events Accompanying Sperm-egg Interactions	
A. Echinoderms	
1. Fertilization in Voltage-Clamped Sea Urchin Eggs Edward L. Chambers	1
2. Sperm Entry in Sea Urchin Eggs: Recent Inferences Concerning Its Mechanism David H. McCulloh	19
3. Correlations Between Time-Dependent and Cytochalasin B Affected Sperm Entry in Voltage-Clamped Sea Urchin Eggs John W. Lynn	43
B. Crustaceans	
1. Electrical Responses to Fertilization and Spontaneous Activation in Decapod Crustacean Eggs: Characteristics and Role Henri Goudeau and Marie Goudeau	61
C. Amphibians	
1. Ion Channels in <i>Rana pipiens</i> Oocytes: Changes During Maturation and Fertilization Lyanne C. Schlichter	89
2. Electrical Capacitance and Membrane Area Raymond T. Kado	133
II. Signal Transduction Mechanisms in Egg Activation	
A. Echinoderms	
1. Receptors, G-proteins and Egg Activation Laurinda A. Jaffe	151
2. What Happens During the Latent Period at Fertilization Michael Whitaker, Karl Swann, and Ian Crossley	157

3. Protein Kinase C and Regulation of the Na ⁺ -H ⁺ Antiporter Activity During Fertilization of the Sea Urchin Egg Sheldon S. Shen	173
B. Urechis, Polychaetes and Molluscs	
1. How Do Sperm Activate Eggs in <i>Urechis</i> (As Well as in Polychaetes and Molluscs)? Meredith Gould and José Stephano	201
C. Amphibians	
1. The Role of the Phosphatidylinositol Cycle in the Activation of the Frog Egg Richard Nuccitelli, James Ferguson, and Jin-Kwan Han	215
D. Mammals	
1. Signal Transduction of Sperm-Egg Interaction Causing Periodic Calcium Transients in Hamster Eggs Shun-ichi Miyazaki	231
2. Egg-Induced Modifications of the Murine Zona Pellucida Gregory S. Kopf, Yoshihiro Endo, Peter Mattei, Shigeaki Kurasawa, and Richard M. Schultz	247
III. Mechanisms of Metabolic Control in Activating Eggs	
A. Echinoderms	
1. An Ode to <i>Edward Chambers</i> : Linkages of Transport, Calcium and pH to Sea Urchin Egg Arousal at Fertilization David Epel	271
Index	285