

An MBoC Favorite: Ca²⁺ entry through store-operated channels in mouse sperm is initiated by egg ZP3 and drives the acrosome reaction

Paul M. Wassarman

Mount Sinai Medical School, New York, NY 10029

In celebration of MBoC's first 20 years, members of the Editorial Board, members of the ASCB Council, and others comment on their favorite MBoC papers from the past two decades.

To fertilize eggs, mammalian sperm must first undergo a form of cellular exocytosis called the acrosome reaction. In 1983, my laboratory reported that nanomolar concentrations of ZP3, one of three zona pellucida glycoproteins from mouse eggs, induced mouse sperm to undergo the acrosome reaction in vitro. Seven years later, this article from Florman's laboratory (O'Toole *et al.*, 2000) revealed that when ZP3 binds to sperm heads, it generates a sustained influx of Ca²⁺ through store depletion-activated channels that function to refill internal Ca²⁺ stores and triggers the acrosome reaction. In the presence of egg ZP3, Ca²⁺ levels in sperm increased nearly 2.5-fold, from ~159 to ~396 nM. This article provided a comprehensive model for the ionic events responsible for ZP3-induced signal transduction in sperm during mammalian fertilization.

REFERENCE

O'Toole A, Arnoult C, Darszon A, Steinhardt R, Florman HM (2000). Ca²⁺ entry through store-operated channels in mouse sperm is initiated by egg ZP3 and drives the acrosome reaction. *Mol Biol Cell* 11, 1571–1584.

DOI: 10.1091/mbc.E12-02-0147

Molecular Biology of the Cell Volume 23 Page 1605.

Address correspondence to: Paul M. Wassarman (paul.wassarman@mssm.edu).

© 2012 Wassarman. This article is distributed by The American Society for Cell Biology under license from the author(s). Two months after publication it is available to the public under an Attribution–Noncommercial–Share Alike 3.0 Unported Creative Commons License (<http://creativecommons.org/licenses/by-nc-sa/3.0>).

"ASCB®," "The American Society for Cell Biology®," and "Molecular Biology of the Cell®" are registered trademarks of The American Society of Cell Biology.