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## JOURNAL ARTICLE

# Evidence for a role of cyclooxygenase (prostaglandin synthetase) and prostaglandins in the sperm acrosome reaction and fertilization

C. L. Joyce, N. A. Nuzzo, L. Wilson Jr and L. J. Zaneveld

Three cyclooxygenase (prostaglandin synthetase) inhibitors, indomethacin, phenylbutazone, and oxyphenbutazone, decreased fertilization in vitro when mixed with capacitated mouse spermatozoa before addition of the treated gametes to oocytes. Fertilization was inhibited whether the oocytes were intact, follicle cell-free, or both follicle cell-free and zona-free. At various concentrations of inhibitor, no effect was observed on the motility or forward progression of the spermatozoa. These cyclooxygenase inhibitors also decreased the guinea pig acrosome reaction. Inhibition of the acrosome reaction did not occur when a mixture of the prostaglandins (PGE<sub>2</sub> or PGF<sub>2</sub> alpha) and one of the inhibitors was added to the spermatozoa. Alone, these prostaglandins tended to enhance the rate at which the acrosome reaction took place. Lowered calcium levels reduced the occurrence of the acrosome reaction, an effect that could be reversed at least partially by the addition of PGE<sub>2</sub>. Even in the nominal absence of calcium, some acrosome reaction took place when PGE<sub>2</sub> was present in the medium. These results support an essential role for cyclooxygenase and arachidonic acid metabolites, including prostaglandins, in the events leading to the acrosome reaction and fertilization.

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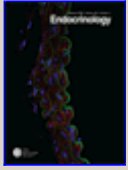
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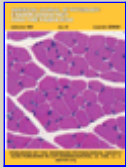
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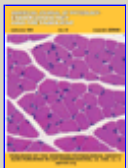
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