Mouse sperm patch-clamp recordings reveal single Cl- channels sensitive to niflumic acid, a blocker of the sperm acrosome reaction

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Ion channels lie at the heart of gamete signaling. Understanding their regulation will improve our knowledge of sperm physiology, and may lead to novel contraceptive strategies. Sperm are tiny (~ 3 ?m diameter) and, until now, direct evidence of ion channel activity in these cells was lacking. Using patch-clamp recording we document here, for the first time, the presence of cationic and anionic channels in mouse sperm. Anion selective channels were blocked by niflumic acid (NA) (IC50 = 11 ?M). The blocker was effective also in inhibiting the acrosome reaction induced by the zona pellucida, GABA or progesterone. These observations suggest that Cl- channels participate in the sperm acrosome reaction in mammals.