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Initiation of sperm motility after mating in the rat and hamster

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Unlike those of many mammals, rat and hamster spermatozoa do not appear to be fully activated at ejaculation. Most rat spermatozoa transported en masse to the uterus approximately 2 minutes after coitus were vigorously motile on recovery soon thereafter in uterine fluid, whereas a majority, and sometimes all, were immotile in samples collected less than 2 minutes after coitus from the anterior vagina of normal females and up to 15 minutes after coitus from the anterior vagina in females with obstructed cervices. Many of these immotile rat vaginal spermatozoa began instant vigorous movement upon exposure to Tyrode's solution or uterine fluid. Hamster spermatozoa recovered from the vagina about 2 minutes after coitus were also immotile or displayed only slow, languid serpentine movements, but that motility profile remained very similar in spermatozoa taken 0.5 hours to 6 hours after coitus from the uterus, which is essentially fluid-free in the hamster. In the hamster, actively motile spermatozoa were evident only in the isthmus of the (transilluminated) oviduct. As in the rat, immotile vaginal and uterine hamster spermatozoa instantly began vigorous progressive motility in vitro on contact with Tyrode's solution or rat uterine fluid. Immotile spermatozoa from the rat and hamster cauda epididymidis immediately became highly motile in Tyrode's solution, and they developed a somewhat less rapid flagellar beat in 150 mmol/L NaCl or KCl, with or without 2 mmol/L CaCl2. In contrast, dilution with an isotonic sucrose solution containing no ions, or only 2 mmol/L CaCl2, evoked very slow and transient movement of rat and hamster epididymal sperm tails.(ABSTRACT TRUNCATED AT 250 WORDS)

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