

Sperm size isn't everything

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Contrary to common scientific belief, the length of a sperm's tail does not always determine how fast it can swim. Research published in the open access journal *BMC Evolutionary Biology* has shown that in the counter-intuitive microscopic world in which sperm operate, streamlining and longer tails don't always provide a speed advantage.

Stuart Humphries, from the University of Sheffield, and collaborators from the University of Western Australia have critically evaluated the evidence linking sperm shape to swimming speed. He said, "It seems clear that some assumptions regarding the physics of sperm locomotion have hampered our progress in understanding the processes mediating sperm competition. It is commonly believed that selection for increased sperm performance will favor the evolution of longer, and therefore faster swimming, sperm. In fact, the relative lengths of a sperm's constituent parts, rather than their absolute lengths, are likely to be the target of selection."

Small size and low swimming speeds mean that, in hydrodynamic terms, sperm operate in a very different regime from the one that we are used to. At this microscopic scale, although a longer tail does allow a sperm to generate more thrust, the drag created by a sperm's head is often enough to counteract any such gains. According to Humphries, "We suggest that, irrespective of whether tail length, total length or head length is used, any attempts to correlate a single measure of length to speed are likely to be futile. We argue that accounting for the balance between drag from the head and thrust from the tail will allow us to extend our understanding of the link between sperm form and function."

These findings imply that, contrary to current thinking, one cannot attribute the evolution of longer sperm to any competitive advantage that length alone gives them.

Citation: Sperm competition: linking form to function, Stuart Humphries, Jonathan P Evans and Leigh W Simmons, BMC Evolutionary Biology (in press) www.biomedcentral.com/bmcevolbiol/

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