

Figure 1. Steering by a temporal break of the beat symmetry.

A sperm cell beating the tail with a single frequency (left) produces a beat waveform that is symmetric. Symmetric beat cannot be used for steering. As a matter of fact, two waves travel simultaneously along the human sperm tail. One wave has a fundamental frequency and the other has twice this frequency. The superposition of these two waves (right) results in an asymmetric beat because the beat amplitude changes in time (bottom). Stimulation of sperm with the female hormone progesterone affects the amplitude and phase of these waves for navigation.

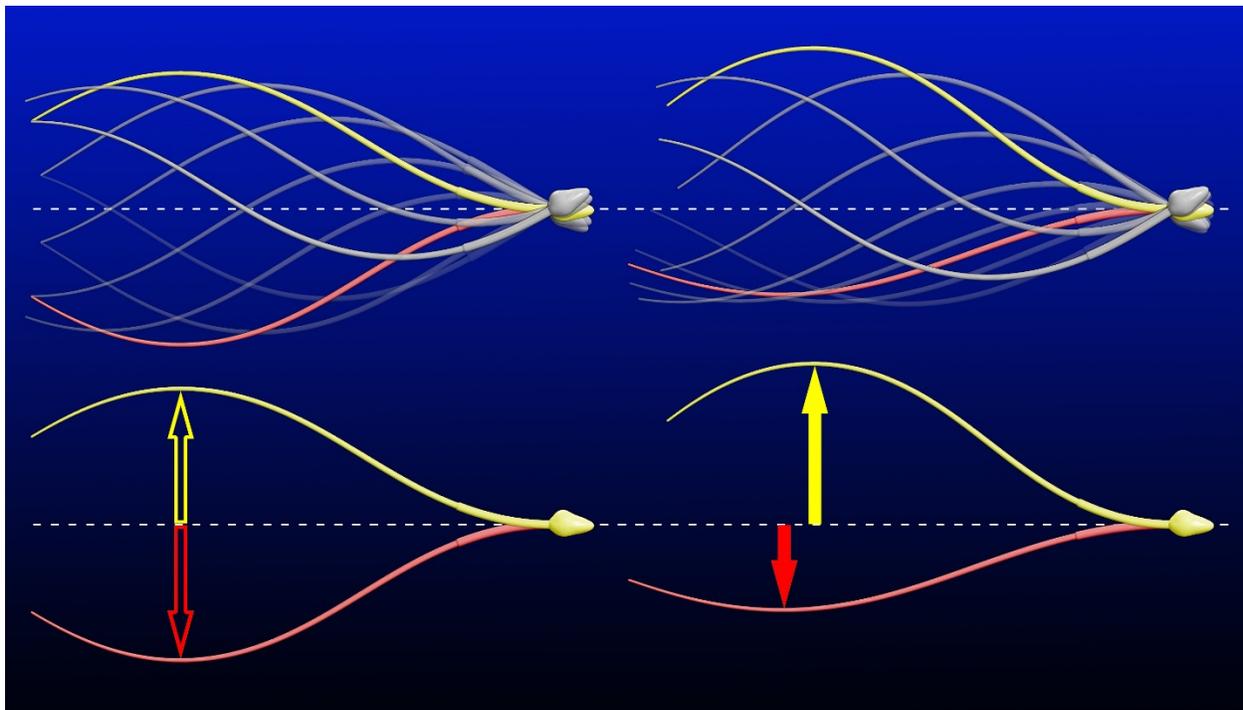


Figure 2. Warhol's sperm

Artistic collage of experimental recordings from human sperm. The central panel summarizes the core finding of this study: Sperm steer by using a combination of two harmonics. The curvature of the swimming path is set by the phase ψ between the two harmonics.

