

New technologies for getting the most out of semen

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For in vitro fertilization and other assisted reproductive technologies, selecting the healthiest and best swimming sperm from a sample of semen can dramatically increase success. Microfluidics—micro-scale technologies that were originally developed to enable high-throughput gene sequencing and for Point-Of-Care diagnostics—are now being adapted to enhance sperm sorting. These new methods, reviewed by engineers in the journal *Trends in Biotechnology*, are generating promising results in applications such as single-sperm genomics, in-home male fertility testing, and wildlife conservation efforts that seek to maintain populations of endangered species.

"Fertilization and reproduction are key to the propagation of a species," says senior author Savas Tasoglu, PhD, an assistant professor in University of Connecticut's Department of Mechanical Engineering. "Microfluidic technologies offer to develop a better understanding of the underlying mechanisms for sperm's motion in complex microenvironments."

Conventional methods for sperm sorting can cause DNA damage, require labor-intensive procedures, and often yield low purity. Tasoglu and his colleagues provide a summary of recently emerging easy-to-use, disposable, inexpensive, and high-throughput microfluidic solutions for sperm selection, which include devices that sort sperm through the use of chemicals, heat, gravity, and other forces and factors.

"Each of these, especially combinations of multiple approaches, has

great potential to sort or control [sperm cells](#) and ultimately revolutionize sperm research," says lead author Stephanie Knowlton. "We hope that our article will spark further research in the field and bring microfluidic technology closer to helping real people."

The investigators anticipate that [microfluidics](#) will make it possible to translate tools developed in research labs into compact, affordable, and accessible products for patients and physicians that require only minimal sample volumes.

More information: *Trends in Biotechnology*, Knowlton et al.:
"Microfluidics for sperm research"

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