

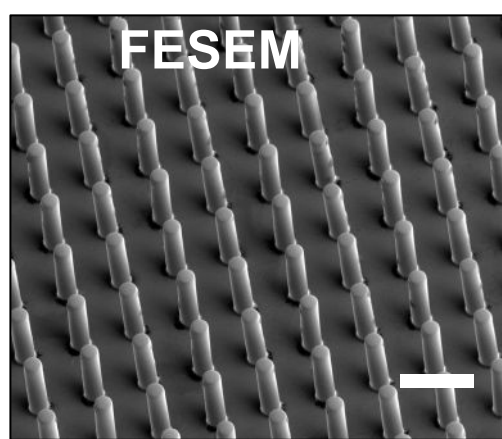
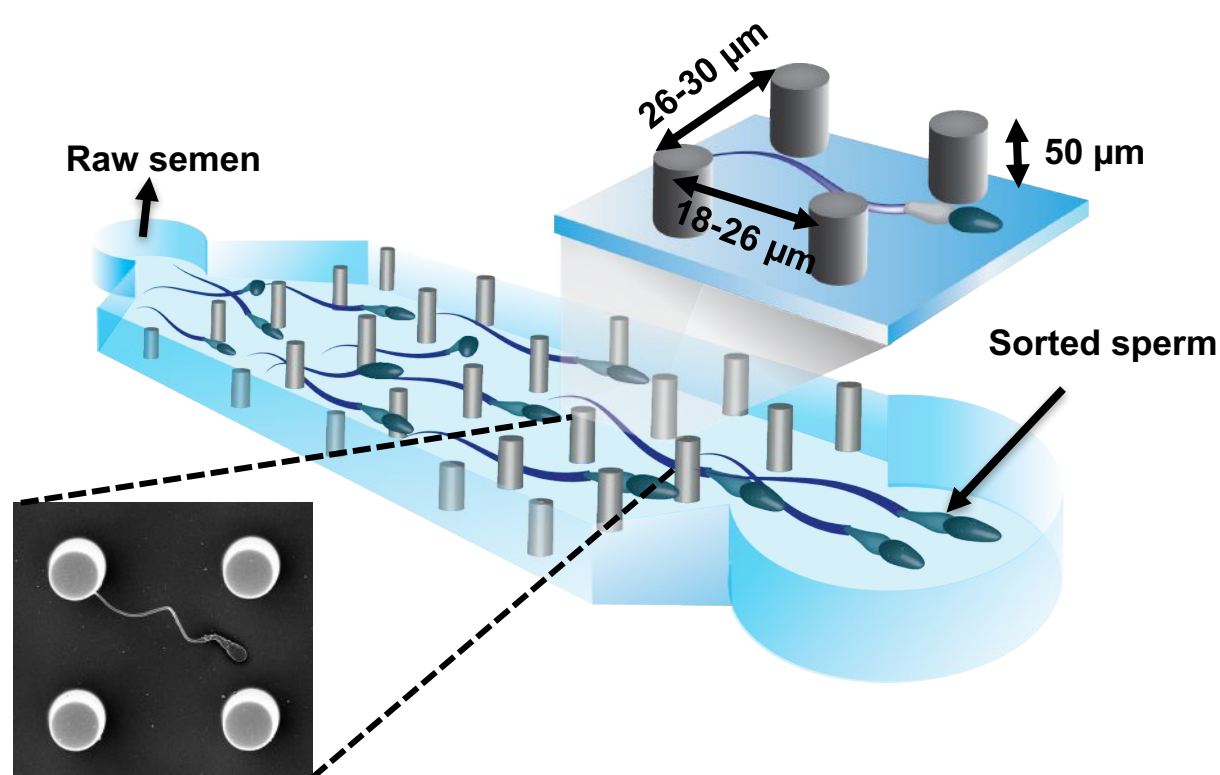
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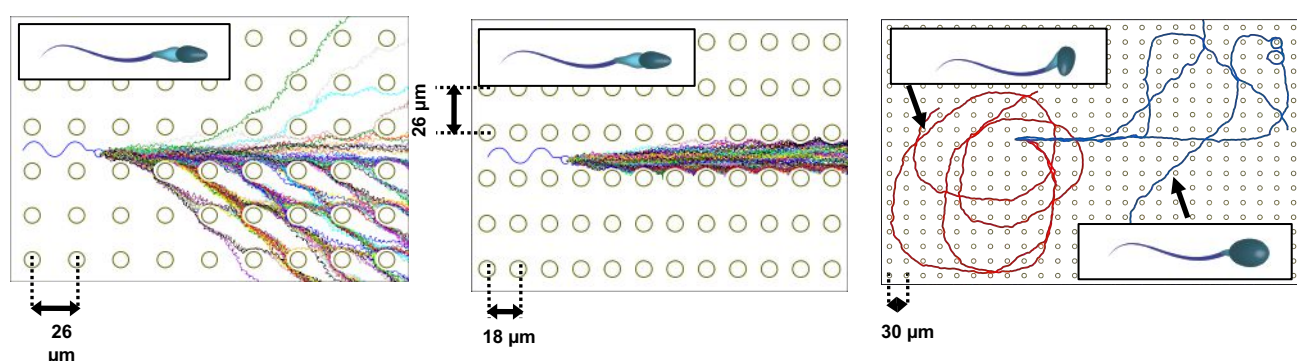
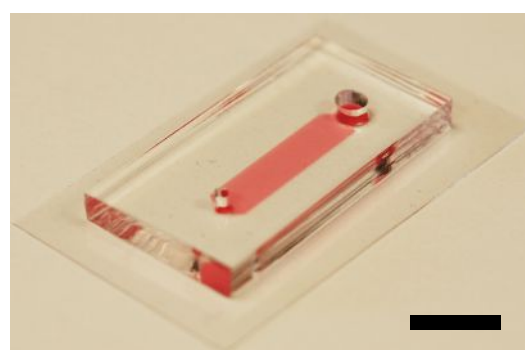
INTRODUCTION

The path that sperm take through the female reproductive system has been conserved for millions of years. This suggests that this sperm journey has significant evolutionary importance. In fact, we know very little about how this reproductive journey influences or “filters” sperm quality for fertilization. We hypothesize that evolutionarily important attributes of sperm are improved by sperm journey. We sought to partially mimic this complex pathway using microfluidics by creating various three-dimensional geometries within microscopic channels. Geometric selection sets were developed based on known hydrodynamic principles that guide the interactions between sperm and surrounding periodic structures.

METHODS & DEVICE DESIGN



Device



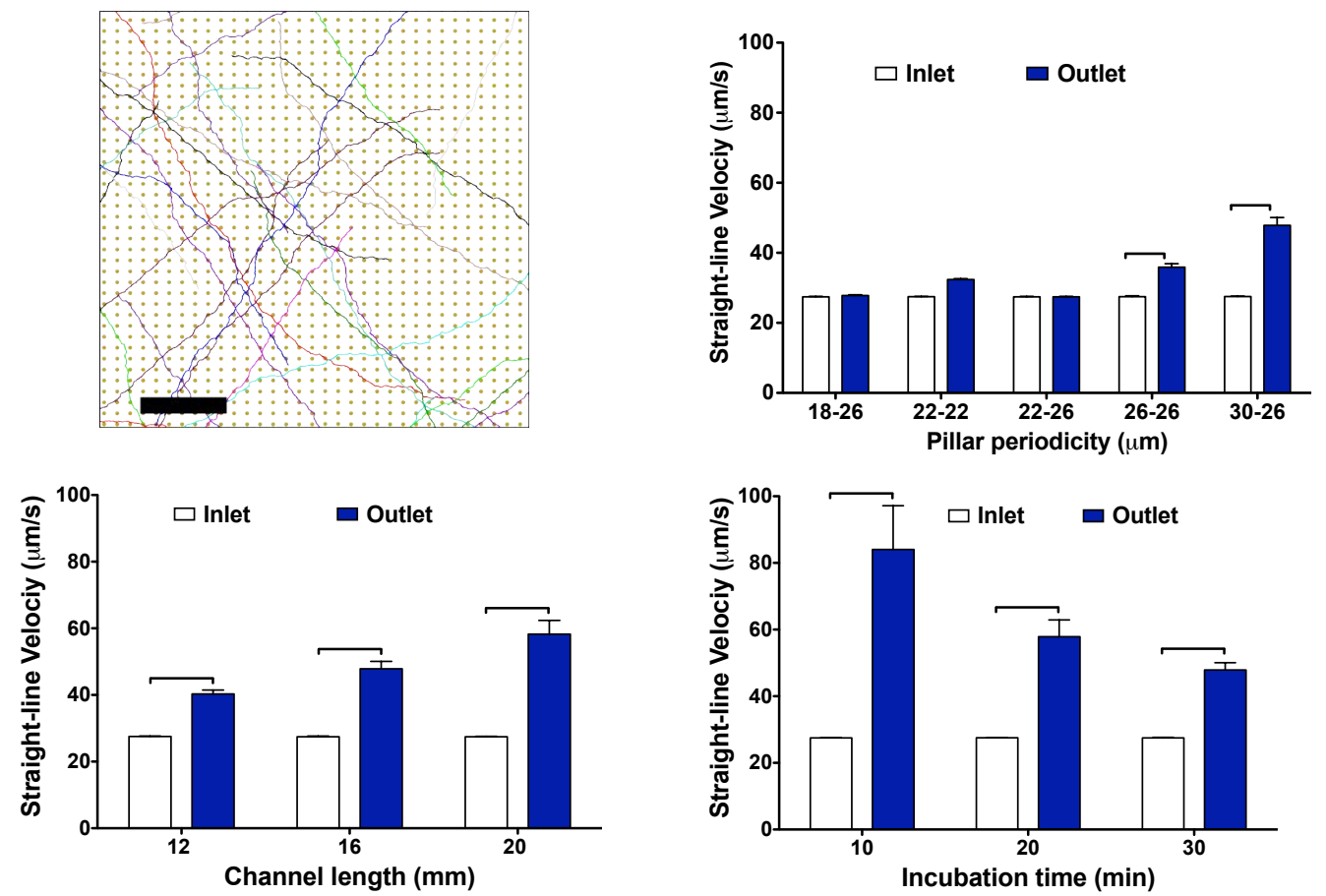
CONCLUSION

The results showed that the sperm sorted using microfluidic device have higher motility and higher percentage of morphologically normal sperm with high DNA integrity as compared to sperm sorted in swim-up approach and unprocessed semen.

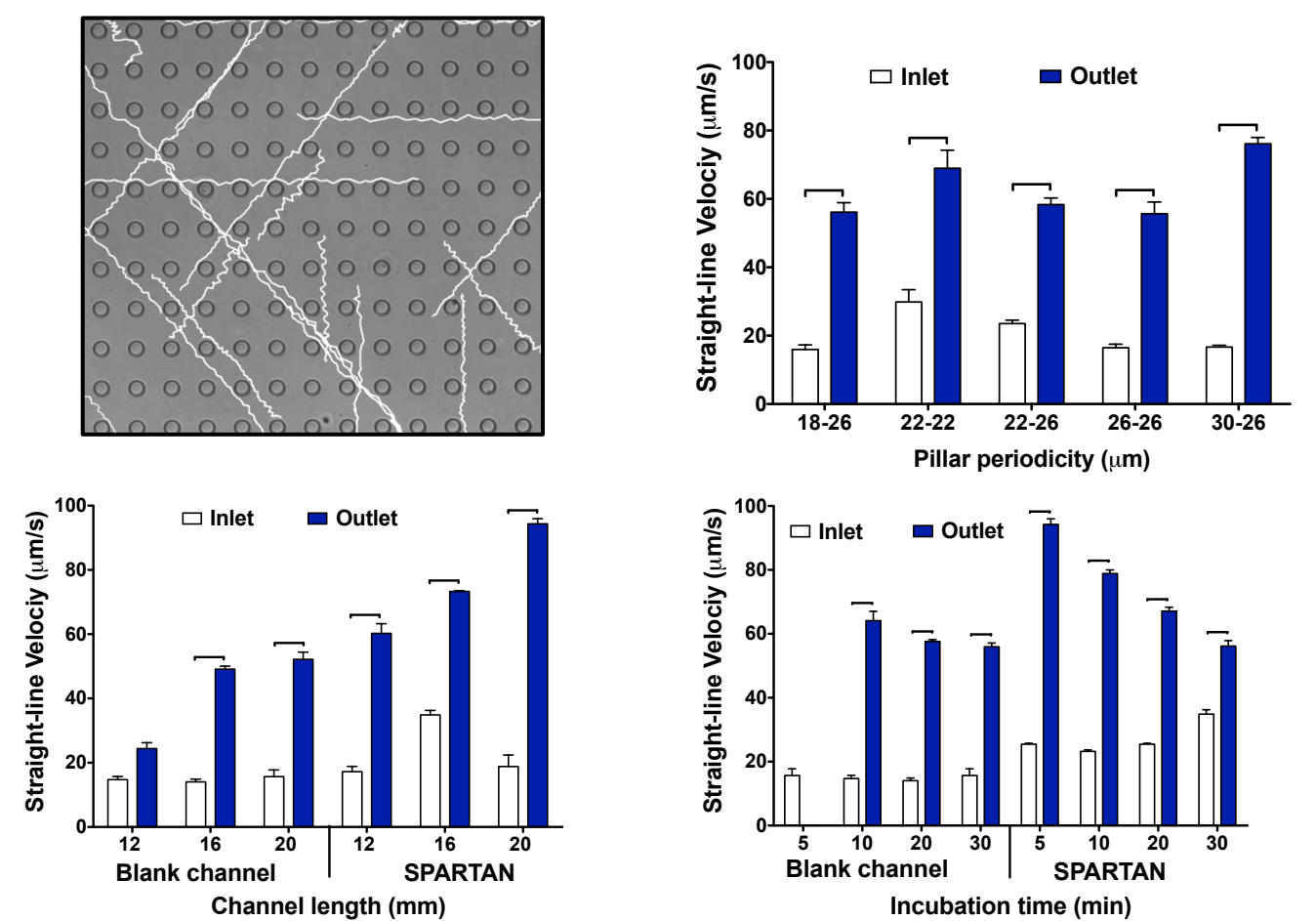
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RESULTS

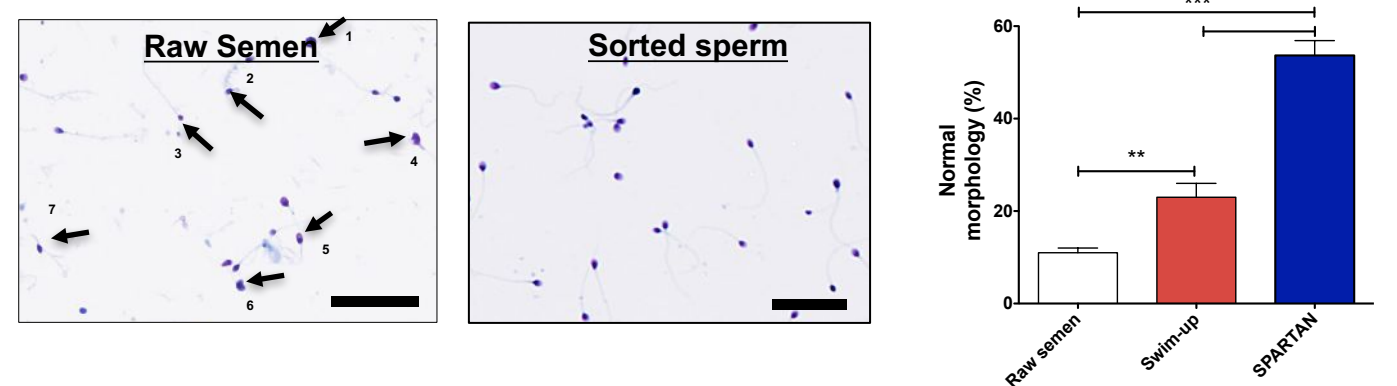
Simulations



Experiments



Sperm morphology analysis



Sperm DNA integrity analysis

