

Title: Rheotaxis based Sperm Selection for Advanced Reproductive Technologies

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In modern reproductive medicine, infertile couples are treated with assisted reproductive technologies (ARTs) that utilize sperm sorting methods to isolated healthy sperm. Current sperm processing methods such as swim-up and density gradient centrifugation involve multiple centrifugal steps that cause damage to the sperm cells in terms of morphology and excessive reactive oxygen species generation that can lead to DNA fragmentation. New ways that mimic the natural guidance mechanisms present in the female genital tract may offer ways to sort sperm with better functional parameters. Human sperm exhibit positive rheotaxis by orienting and swimming against the fluid released in female genital tract. We have developed a microfluidic device to quantitatively investigate the sperm response to various flow conditions at physiological conditions. At certain flow rates sperm can actively orient and swim against the flow. Sperm showing rheotaxis exhibit better motility and velocity parameters than no-flow control and original semen sample.

Biography

Dr. Waseem Asghar is an Assistant Professor at College of Engineering and Computer Science at Florida Atlantic University. He received his Ph.D. in Spring 2012 from University fo Texas. Dr. Asghar held a postdoctoral appointment at Harvard Medical School (July 2012-April 2014). His research focuses on development of microfluidic platforms advanced reproductive technologies and infectious disease diagnostics. He has published over 50 journal and conference papers. He is recipient of various international and national awards including “2018 Distinguised STEM Educator Award from the Engineers’ Council”, and “Humanity in Science Award 2016”.

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