



# Thesis Projects (MIE498 H/Y) 2018–2019

**Title/Topic:**

A microfluidic platform for the treatment of infertility

**Description:**

The objective of this thesis is to develop a microfluidic platform to select high-quality human sperms for Intracytoplasmic Sperm Injection (ICSI) to solve the problem of male infertility. High quality sperm, featured with high DNA integrity and low aneuploidy, are typically selected by empirical criteria, such as sperm morphology and motility, while the selection condition is far different than the physiological condition of natural fertilization. A microfluidic chip contents channels with the dimension of 1-1000 micrometer can better mimic the natural microenvironment of sperm fertilization. In addition, the proposed microfluidic platform allows the separation and collection of individual sperms with identical motility and morphology for on-chip analysis of DNA integrity and aneuploidy. This work is suitable for academically outstanding students, with an interest in pursuing graduate work, who are skilled at mechanical component design, fabrication, and operation and/or have biological background.

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