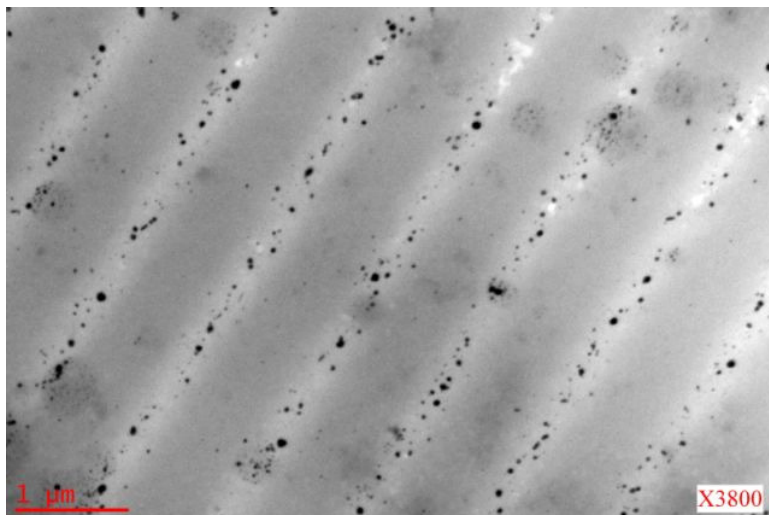


Biodiagnostics: Sample Concentration

Project Supervisor: Adrian Neild
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Department: Mechanical & Aerospace, Laboratory for Micro Systems (LMS)
Suitability: Aerospace, Mechatronics or Mechanical students with an interest in experimentation

The Challenge

Microfluidic systems offer the possibility of reducing laboratory scale experimental processes into a device the size of a chip. A key motivation for this is the possibilities it offers in biomedical testing, both in terms of improved accuracy and in performing response analysis which is not possible at large scales. In many biomedical tests the chemical solution in which cells are suspended is changed to examine response, the challenge is to do this at the microscale with the advantage that small length scales mean very fast changes and hence better time related data.



*Collection of small particles:
Here nanoparticles are held in
multiple locations. This project
will look at holding
microparticles in a single
location, such that the
surrounding fluid can be
changed.*

The Project

Work in LMS has shown that it is possible to manipulate micrometer-scale particles using acoustic fields. The goal of this project is to develop a start-of-the-art device capable of holding these particles with sufficient strength that fluid can flow around the agglomeration without disturbing it. In this manner the particles can be held in location whilst the suspension fluid type is changed.

Project activities include design and characterisation of microfluidic systems. This challenging project is suited to final-year students with an interest in microfluidics and biomedical engineering, and requires data analysis (matlab), problem solving abilities as well as getting to grips with the theory of the collection mechanism.