CELL SEPARATION

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Currently, in rape and sexual assault cases, a technique called 'preferential lysis' is used to obtain a male DNA profile from a mixture of male and female cells. This technique takes advantage of the relative resilience of spermatozoa compared to epithelial and other cells, against the enzymatic action employed during DNA extraction. In cases where the number of female cells (comprising mainly epithelial cells and leucocytes is significantly larger than the number of spermatozoa, this technique is less effective, with the female DNA profile frequently obscuring that of the male. In cases involving aspermic semen, despite the presence of male epithelial cells, preferential lysis is ineffective due to a lack of spermatozoa.

The aim of this project is to overcome the limitations of preferential lysis by developing alternative methods of cell separation. The development of several techniques will enable each case to be evaluated individually and in turn processed using the most appropriate method.

Flow cytometry, paramagnetic beads, filtration, and micromanipulation have all been considered. Each of these methods offers different potential benefits over preferential lysis, including speed, safety, sensitivity or discrimination.