

The use of laser microdissection for the genotyping of biological material isolated during an abortion

Abstract

In forensic genetics laser microdissection is used mainly as a method of cell separation from samples of mixed biological traits of sexually motivated crimes. It can also be used in paternity testing via genotyping of biological material isolated during an abortion. The foetal part of placenta is separated from the acquired samples and a pure DNA profile of the foetus is determined. This DNA can be compared to the suspect's DNA. The goal of this project is the application of laser microdissection to separate chorionic villi from a placenta and the subsequent genetic analysis leading to the determination of a pure foetal DNA profile. A secondary goal was the preparation and optimization of the method necessary for its introduction to forensic practice.

In the first phase the optimization of the sample preparation was conducted on test sections of muscular tissue and epithelial cells from a buccal swap. Experimental material acquired during abortions of voluntary donors was used in the second phase. This technique was simultaneously tested on material directly linked to criminal acts. The separation of 10 chorionic villi cells with the method of laser microdissection eventually resulted in the determination of a pure foetal DNA profile.

Key words

Laser microdissection, tissue sections, placenta, chorionic villi, foetal DNA profile, paternity testing