

S009 The Polymerase Chain Reaction (PCR) in forensic genetics **Niels Morling**

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During the past 20 years, a revolution has taken place within the field of forensic genetics by the introduction of DNA investigations. Today, almost all forensic genetic DNA investigations are based on enzymatic amplification of DNA by the Polymerase Chain Reaction (PCR). In most cases, repetitive DNA sequences in micro satellite regions – Short Tandem Repeat (STR) - are investigated. In special cases, DNA sequencing is performed – especially of mitochondrial DNA. During the last years, more and more forensic genetic laboratories use typing of Single Nucleotide Polymorphisms (SNP). The major challenges in DNA typing in crime cases is the investigation of biological material with very small amounts (~100 pg) of DNA, degraded DNA and agents that inhibit the PCR. The traditional forensic genetic DNA investigations include identity testing in crime cases and genetic relationship testing in paternity and immigration cases. During the last years, DNA investigations have been developed for new purposes. Thus, it is now possible to detect genetic predispositions to reactions towards drugs (pharmacogenetics), predict the ethnic origin of a person by typing so-called ancestry informative markers, the colour of the eyes and other physical traits. Genetic investigations in e.g. cases of unexpected sudden death can help to identify the cause of death in forensic pathology.