DNA profiling

- A sample of DNA is obtained from blood / hair / saliva / semen.
- **PCR** copies (**amplifies**) the DNA, which is then cut into short fragments using **restriction enzymes** (restriction endonucleases).
- **Gel electrophoresis** separates the fragments of DNA into a series of bands on the gel according to their charge and size.
- The bands are compared between different DNA samples because the pattern of bands is unique to an individual.
- If some bands are similar, the individuals are related.
- Can be used in:
    - genetic screening – the presence of particular bands correlates with the probability of a certain phenotype or allele.
    - paternity testing, e.g. DNA obtained from child and parents in paternity cases - one half of all bands in the child will be from the father.
    - forensic use / crime scene investigation, e.g. DNA obtained from crime scene / victim and compared to DNA from suspect.
    - determining the identity of dead people, e.g. the last Russian Tsar and his family.
    - tracking migrating animal populations.

Note: Contamination of the samples can cause problems in identifying an individual.