Student Guide - Paternity Testing

The aim of this experiment is to determine who the father of a tested child is by determining which alleles of DNA were inherited from which parent.

Each lab group requires

1 gel
1 set of DNA samples M, C, F1, F2
1 micropipette and tips
60ml 1X DNAstain

Running the Experiment

1. Load 40µl sample M into well 1.
2. Continue loading consecutive samples into consecutive wells as follows: C, F1, F2.
3. Place gel into electrophoresis tank.
4. Carefully cover gel with diluted electrophoresis buffer.
5. Cover tank with lid and switch power on.

Alternatively, you can place the gel into the tank, cover it with buffer and then load the samples through the buffer.

Run gel until gel loading dye is about two thirds down the gel, about 30 minutes at 150V.

CAUTION: Be careful when using high voltage power supplies! Switch off power supply before removing gels.

Staining the gel

Gloves are recommended.

1) Remove the gel from the casting tray and place it in the staining tray.
2) Cover the gel with stain and leave for 10 minutes.
3) Remove all the stain.
4) Dry the surface of the gel with blotting paper by gently positioning it on top of the gel.
5) Remove the blotting paper from the gel and allow gel to develop. Bands will appear in 10-15 minutes.

Result interpretation

Everyone gets two copies of each allele (STR in this scenario) at each region of DNA, one from their mother and one from their father. There are two possible alleles, big or small. If someone has two copies of the same allele (homozygote), you will only see one band – but remember there are still two copies present.

This result simulates a PCR test for two regions of DNA. For each primer set, there are two possible alleles, that is, different sized pieces of DNA. Primer set one produces either a 4.0 kilobase (kb) or 3.0 kb piece of DNA. Primer set two produces either a 2.0 kb or 1.0 kb piece of DNA.

Use the pattern to work out who is the child's biological father.