Plan

• Analysis of DNA using DNA Gel Electrophoresis
  Separation in an electric field to
  o Separate DNA fragments according to size
  o Visualize DNA fragments

• Technical
  o Gel preparation- composition of gel, DNA-staining dye
  o Sample preparation, Loading dye mixture and tracking dye
  o Loading and running of the gel
  o Visualization of DNA fragment
  o Analysis of results
DNA Gel Electrophoresis

Background Information

• DNA gel electrophoresis
• Agarose gels composition
• DNA charge & direction of migration during electrophoresis
• Effect of size of linear DNA on its migration
• Molecular weight size marker & size determination of linear DNA
• Gel-loading Dye (glycerol and tracking dye)
• Application: Restriction Fragment length polymorphism & DNA finger-printing or profiling
• Migration of non-linear DNA fragments: super-coiled and relaxed circles

Basic Lab Skills (DNA Gel Electrophoresis)

• Preparation of agarose gels for DNA analysis
• Preparation of digestion reaction for gel loading
• Use of molecular weight markers and running DNA electrophoresis gels
• Analysis of results
• DNA Gel electrophoresis
  http://www.dnalc.org/ddnalc/resources/animations.html
  http://www.tvdsb.on.ca/westmin/science/sbioac/genetics/electro.htm

• Restriction Fragment length Polymorphisms (RFLPs)
  http://highered.mcgraw-hill.com/sites/0072437316/student_view0/chapter16/animations.html#
DNA Gel Electrophoresis Results & Analysis

Background Information & Basic Lab Skills

• 1 kb plus ladder- fragment sizes

• Migration of super-coiled and relaxed circles of plasmids

• Comparison of pattern of fragments for uncut and cut plasmid (BamHI- HindIII)

Questions
DNA Fingerprinting

• Isolation of DNA
• Cutting, sizing, and sorting DNA. Special enzymes called restriction enzymes
• Producing a DNA profile of fragments that appear as bands
  (using many alternative techniques..)
Practical Applications of DNA Fingerprinting

- Paternity and Maternity
- Personal Identification/Criminal Identification and Forensics
Practical Applications of DNA Fingerprinting

“Forensic Biotechnology Whodunit?” by Jenny Shaw, Vanessa Petty, Theresa Brown, and Sarah Mathiason
Practical Applications of DNA Fingerprinting