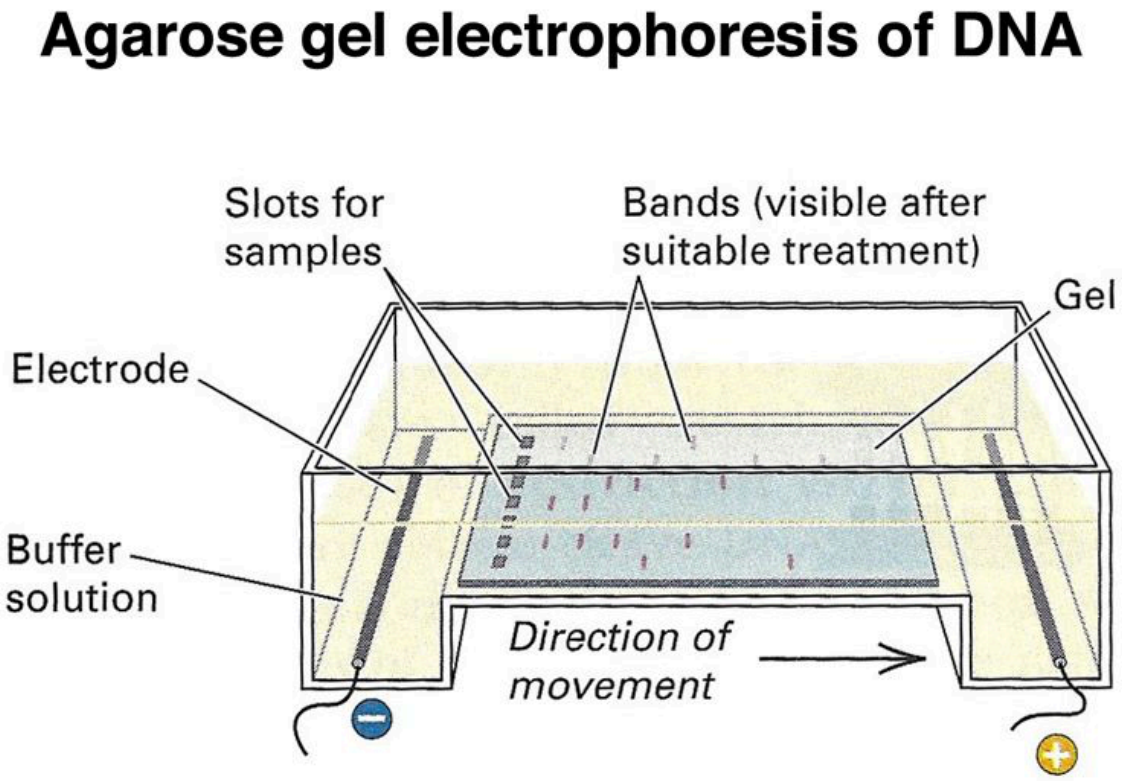
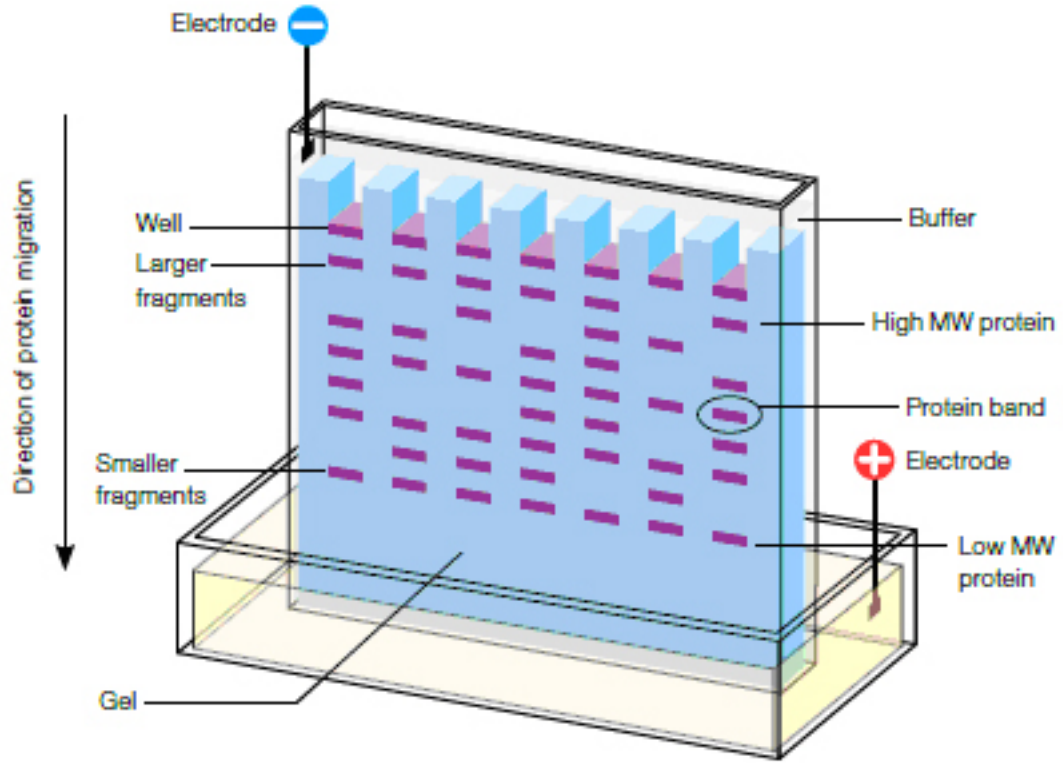
AGE


Agarose gel electrophoresis of DNA
Slots for samples
Bands (visible after suitable treatment)
Gel
Electrode
Buffer solution
Direction of movement

Gel electrophoresis is the standard lab procedure for separating DNA by size (e.g., length in base pairs) for visualization and purification. Electrophoresis uses an electrical field to move the negatively charged DNA through an agarose gel matrix toward a positive electrode. Shorter DNA fragments migrate through the gel more quickly than longer ones. Thus, you can determine the approximate length of a DNA fragment by running it on an agarose gel alongside a DNA ladder (a collection of DNA fragments of known lengths).

- https://www.cleaverscientific.com/applications/agarose-gel-electrophoresis-of-dna/

SDS-PAGE


Electrode
Direction of protein migration
Well
Larger fragments
Smaller fragments
Gel
Buffer
High MW protein
Protein band
Electrode
Low MW protein

- **PAGE**

  Polyacrylamide gel electrophoresis (PAGE) is probably the most common analytical technique used to separate and characterize proteins. A solution of acrylamide and bisacrylamide is polymerized. Acrylamide alone forms linear polymers. The bisacrylamide introduces crosslinks between polyacrylamide chains. The 'pore size' is determined by the ratio of acrylamide to bisacrylamide, and by the concentration of acrylamide. A high ratio of bisacrylamide to acrylamide and a high acrylamide concentration cause low electrophoretic mobility. Polymerization of acrylamide and bisacrylamide monomers is induced by ammonium persulfate (APS), which spontaneously decomposes to form free radicals. TEMED, a free radical stabilizer, is generally included to promote polymerization.

- **SDS PAGE**
  Sodium dodecyl sulfate (SDS) is an amphipathic detergent. It has an anionic headgroup and a lipophilic tail. It binds non-covalently to proteins, with a stoichiometry of around one SDS molecule per two amino acids. SDS causes proteins to denature and dissassociate from each other (excluding covalent cross-linking). It also confers negative charge. In the presence of SDS, the intrinsic charge of a protein is masked. During SDS PAGE, all proteins migrate toward the anode (the positively charged electrode). SDS-treated proteins have very similar charge-to-mass ratios, and similar shapes. During PAGE, the rate of migration of SDS-treated proteins is effectively determined by molecular weight. Sodium Dodecyl Sulfate Poly-Acrylamide Gel Electrophoresis, or SDS-PAGE, is a widely-used technique for separating mixtures of proteins based on their size and nothing else. SDS, an anionic detergent, is used to produce an even charge across the length of proteins that have been linearized. By first loading them into a gel made of polyacrylamide and then applying an electric field to the gel, SDS-coated proteins are then separated. The electric field acts as the driving force, drawing the SDS coated proteins towards the anode with larger proteins moving more slowly than small proteins. In order to identify proteins by size, protein standards of a known size are loaded along with samples and run under the same conditions.