CONCEPT: NATIVE GEL ELECTROPHORESIS

●Native gel electrophoresis: electric field separates *charged* proteins based on their _____ *charges*, *shapes* & *sizes*.

□ Also known as Native Polyacrylamide Gel Electrophoresis (Native-_____).

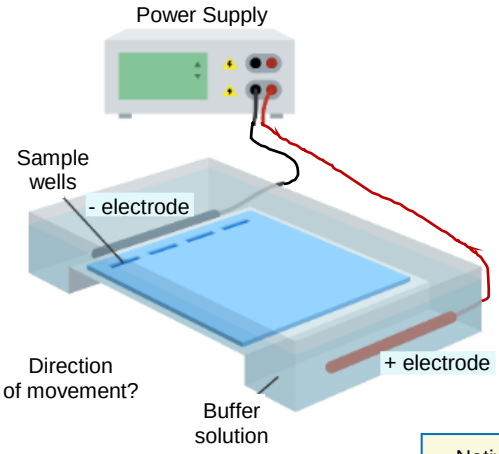
●An electric field generates negative & positive charges on _____ ends of the gel.

□ Only proteins with *native* _____ move in electric fields _____ their opposite charge.

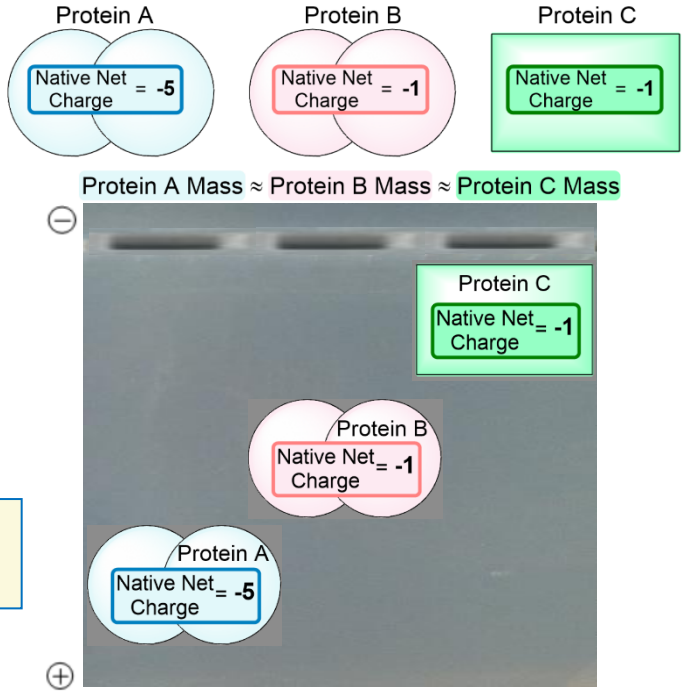
□ Larger proteins travel _____ but proteins *retain* native shapes & charges, which also affect gel migration.

□ Different proteins appear as different _____ on the gel & quantities indicated by band intensity/thickness.

EXAMPLE: Native-PAGE.



Native-PAGE: migration in gel affected by *mass* but also native _____ & _____.



PRACTICE: Which advantage does native gel electrophoresis provide as a protein technique?

a) Allows separation of all native proteins as they migrate through the gel.
b) Allows separation of all native protein subunits based on their size (large proteins travel slower).
c) Native proteins always migrate through the electric field towards the positive end.
d) Separates charged proteins while allowing them to retain their native conformation.

PRACTICE: Which option below best describes the native gel electrophoresis migration for Proteins A, B, C & D (assuming equal mass & shape) considering that the buffer solution has a pH = 6.4.

Protein A pI = 5.2, Protein B pI = 6.4, Protein C pI = 7.0, Protein D pI = 9.2

a) A & B will migrate to the negative pole while C & D migrate to the positive pole.
b) A will migrate to the positive pole, B will not migrate, while C & D migrate to the negative pole.
c) A & B will migrate to the positive pole while C & D migrate to the negative pole.
d) A will migrate to the negative pole, B will not migrate, while C & D migrate to the positive pole.

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PRACTICE:

A) Consider both the peptide Gly—Pro—Ser—Glu—Thr (in a linear chain) and a cyclic peptide of the same exact sequence Gly—Pro—Ser—Glu—Thr (with a peptide bond linking the Thr & Gly). Are these peptides chemically the same? Explain.

B) Can you expect to separate the peptides above by Native-PAGE? Why or why not?