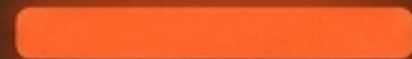


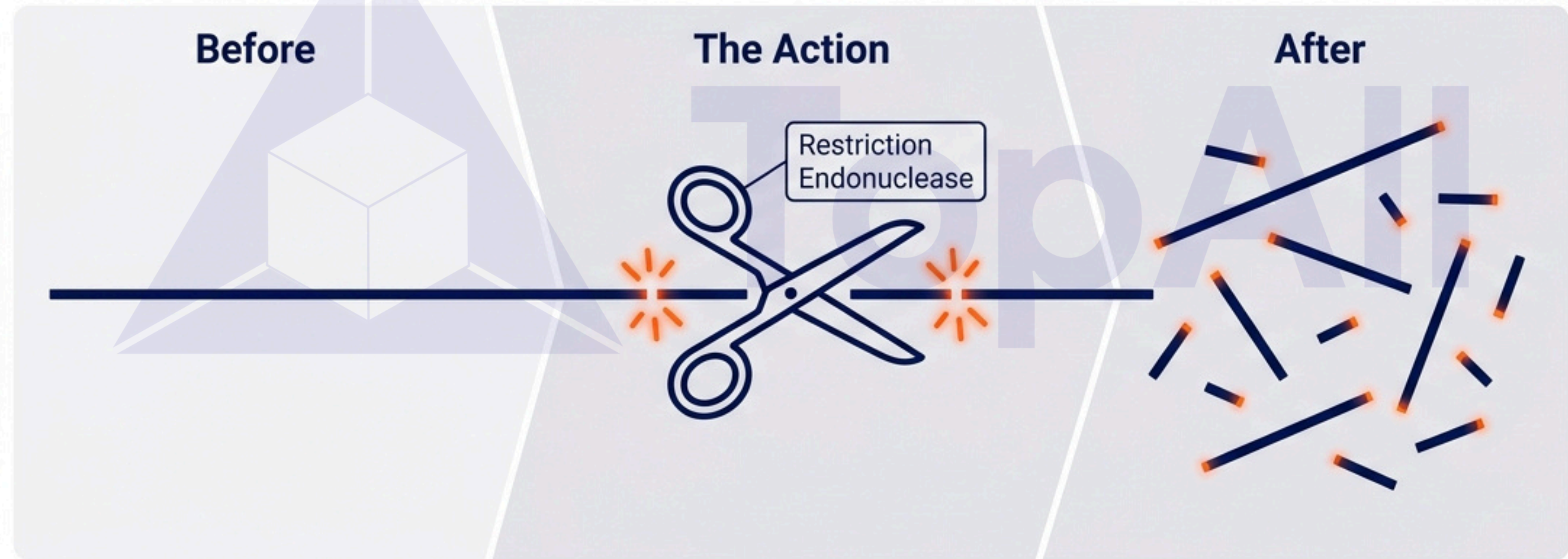
Gel Electrophoresis: Sorting DNA

The principles of isolating fragments for recombinant DNA technology.



The Starting Point: Restriction

Before sorting can begin, restriction endonucleases act as molecular scissors, cleaving pure DNA into a heterogeneous mixture of varying lengths.

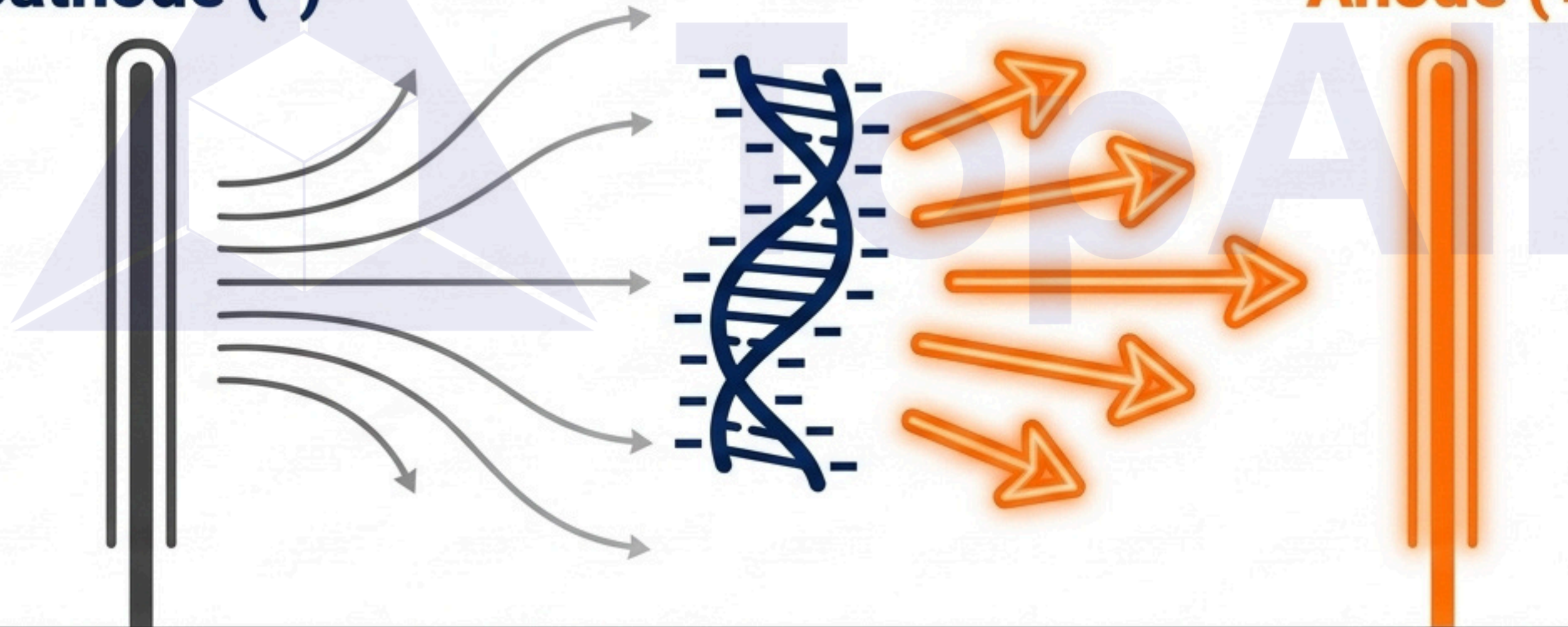


The Driving Force: Negative Charge

DNA fragments are negatively charged molecules. When placed in an electric field, they are forcefully drawn toward the positive electrode (anode).

Cathode (-)

Anode (+)





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$$E=mc^2$$



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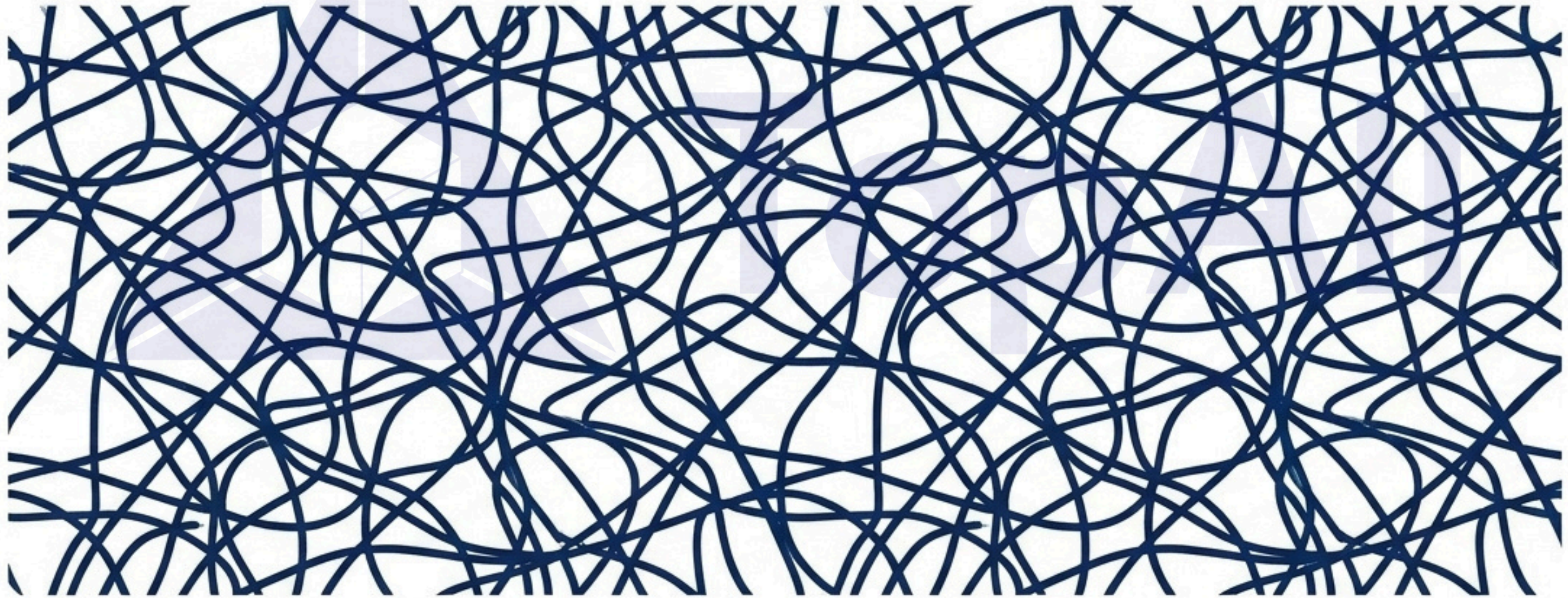
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- » Push Your Limits with Level-Based Challenges
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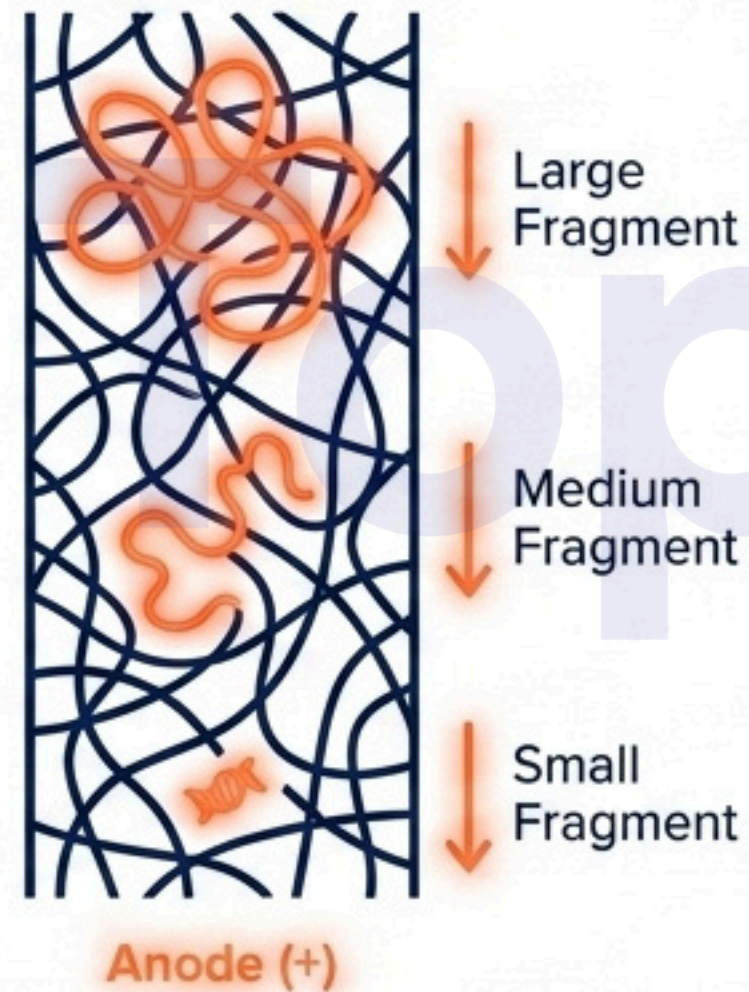
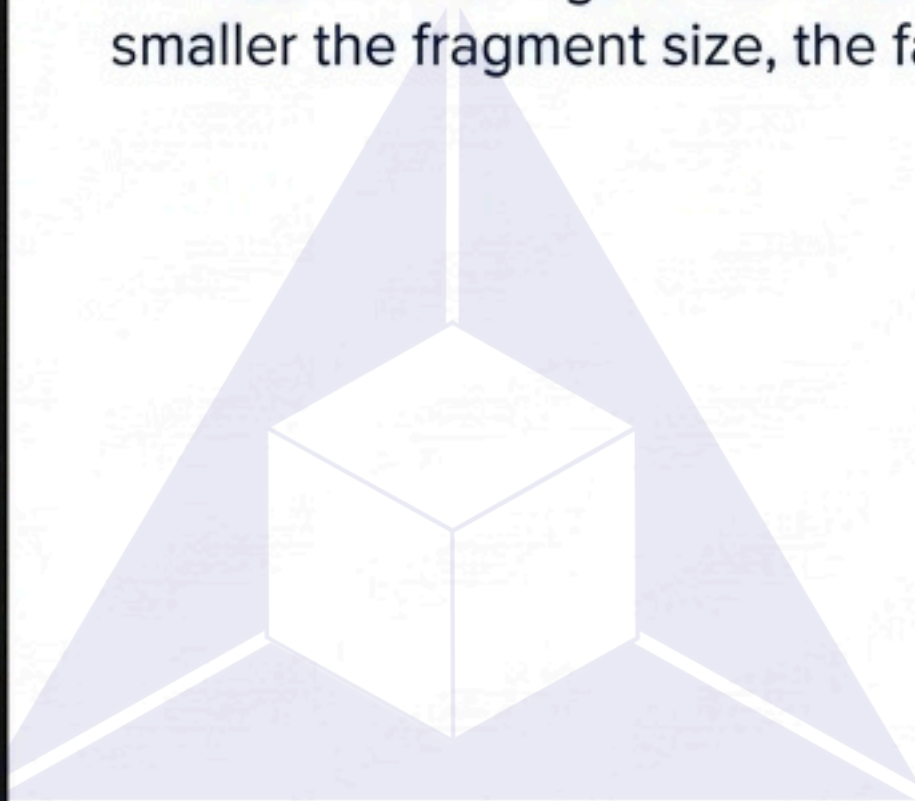
The Medium: A Molecular Sieve

Fragments do not travel through empty space. They are forced through agarose, a natural polymer extracted from seaweeds that forms a microscopic, three-dimensional mesh.



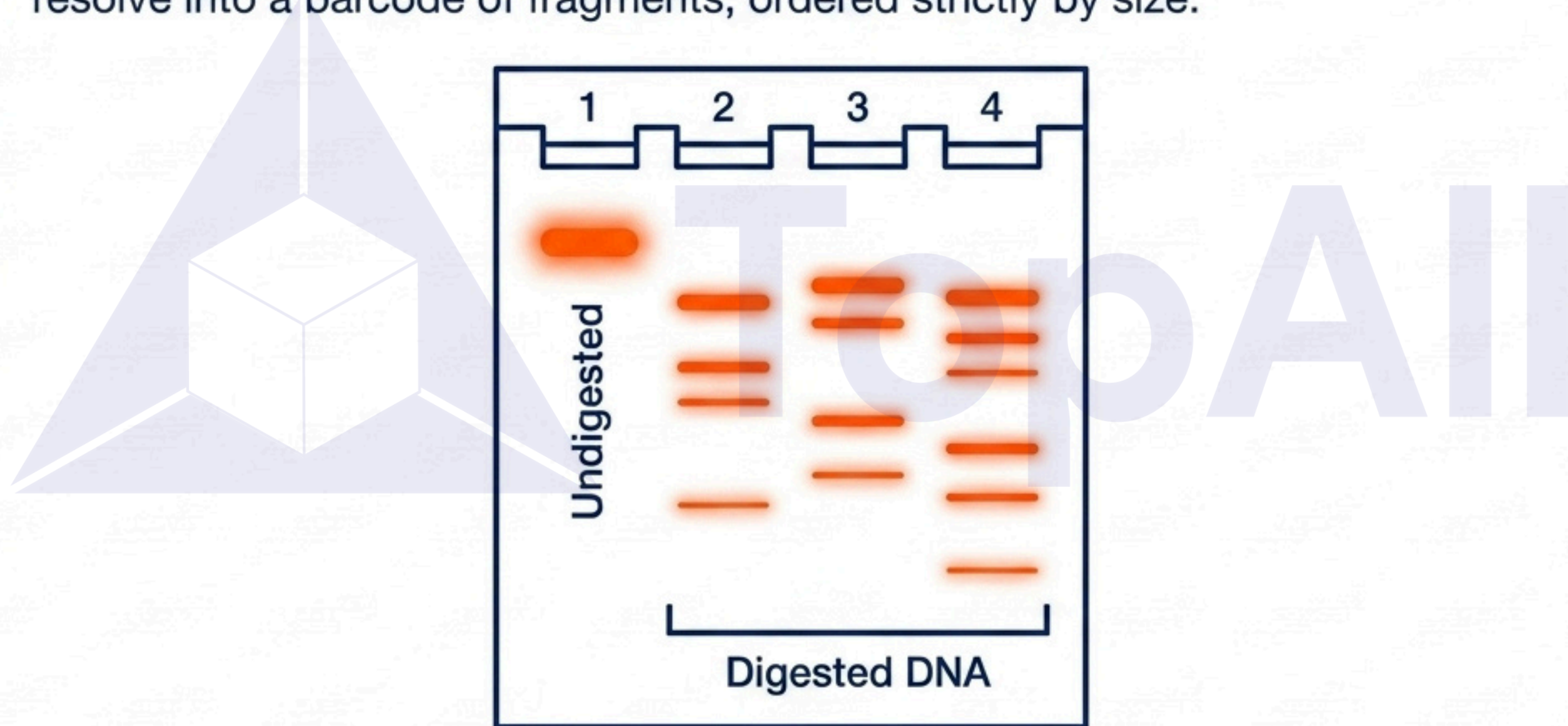
The Separation Mechanism: Size

Because the charge-to-mass ratio is uniform, size is the only differentiating factor. The smaller the fragment size, the farther it moves through the sieving effect of the gel.



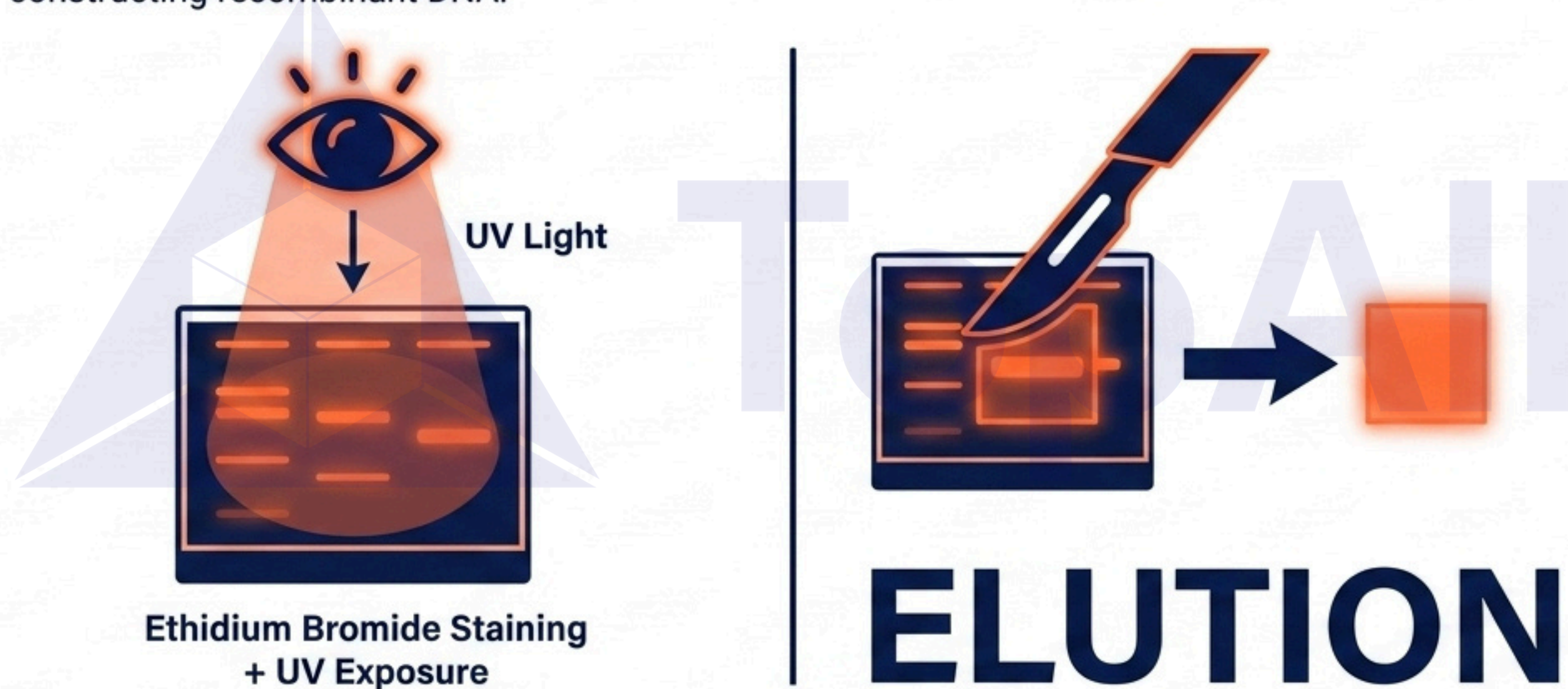
The Macroscopic View

The microscopic race results in a macroscopic pattern. Digested samples resolve into a barcode of fragments, ordered strictly by size.



Visualization & Elution

Pure DNA fragments are invisible in normal light. They must be stained and cut out to be used in constructing recombinant DNA.





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