

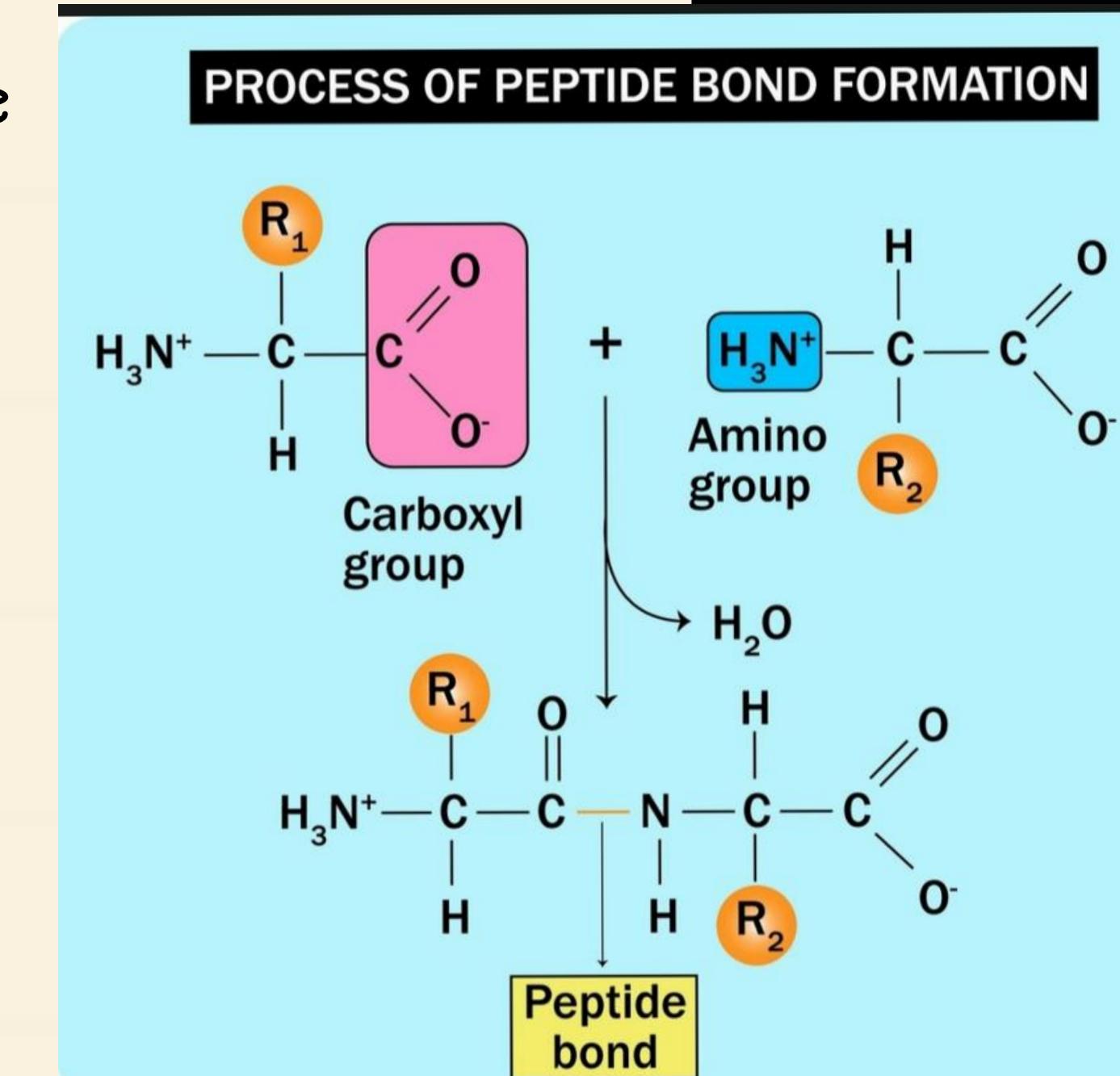
# PROTEIN

BY- SHIVA GUPTA

*(Bio-TECH 1ST YEAR)*

# The Building Blocks (The Basics)

- \* What are Proteins? Large, complex molecules that play many critical roles in the body.
- \* The Unit: Made of long chains of Amino Acids (the "monomers").
- \* Diversity: There are 20 types of amino acids.
  - \* Like the 26 letters of the alphabet, they can create millions of different "words" (proteins).
- \* The Bond: Amino acids are linked together by Peptide Bonds.
- \* Visual:



## THE PROCESS (SYNTHESIS)

# Central Dogma

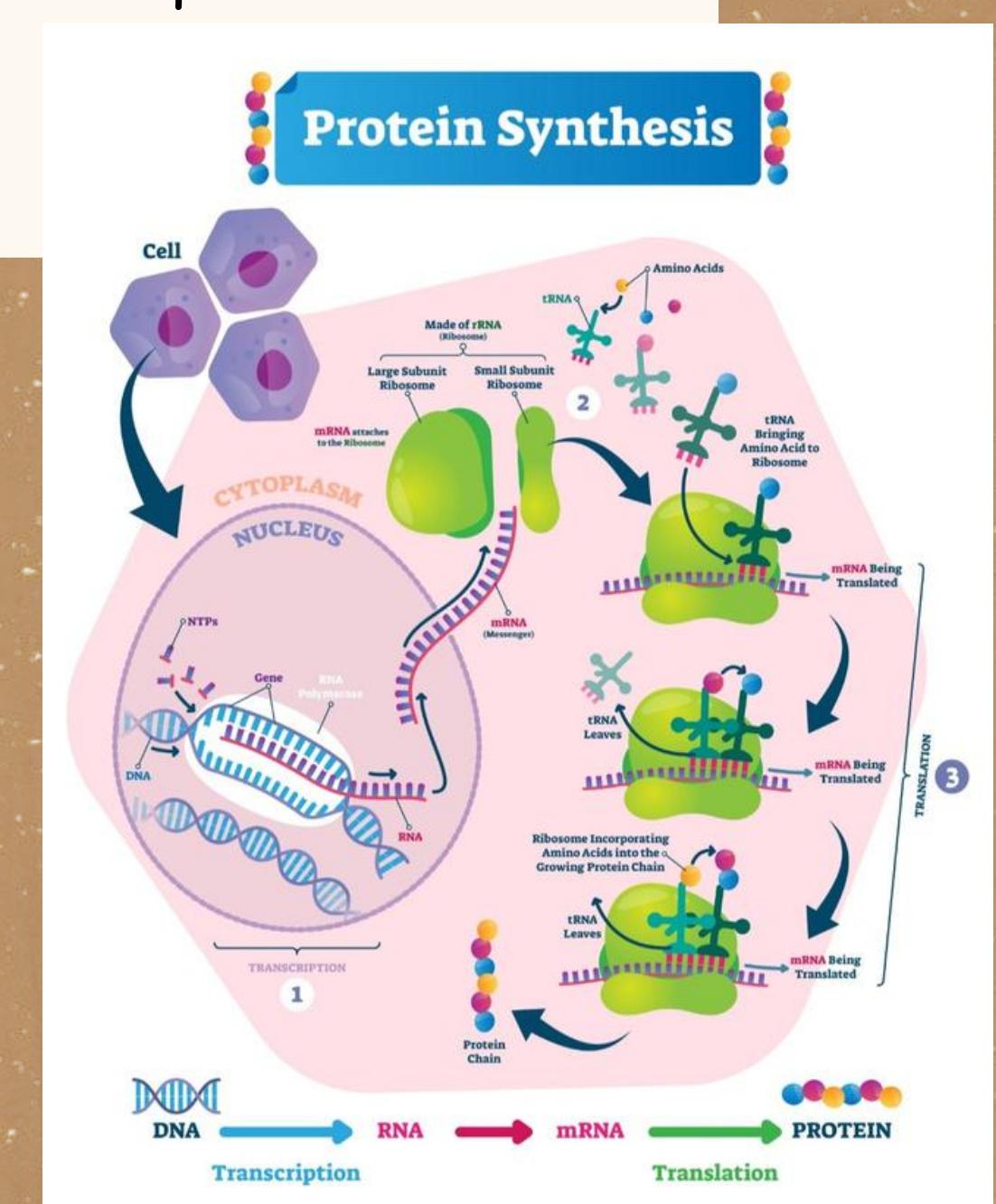
Transcription

DNA inside the nucleus acts as the "Master Blueprint." It is copied into mRNA.

Translation: The mRNA goes to the Ribosome (the factory).

Assembly:

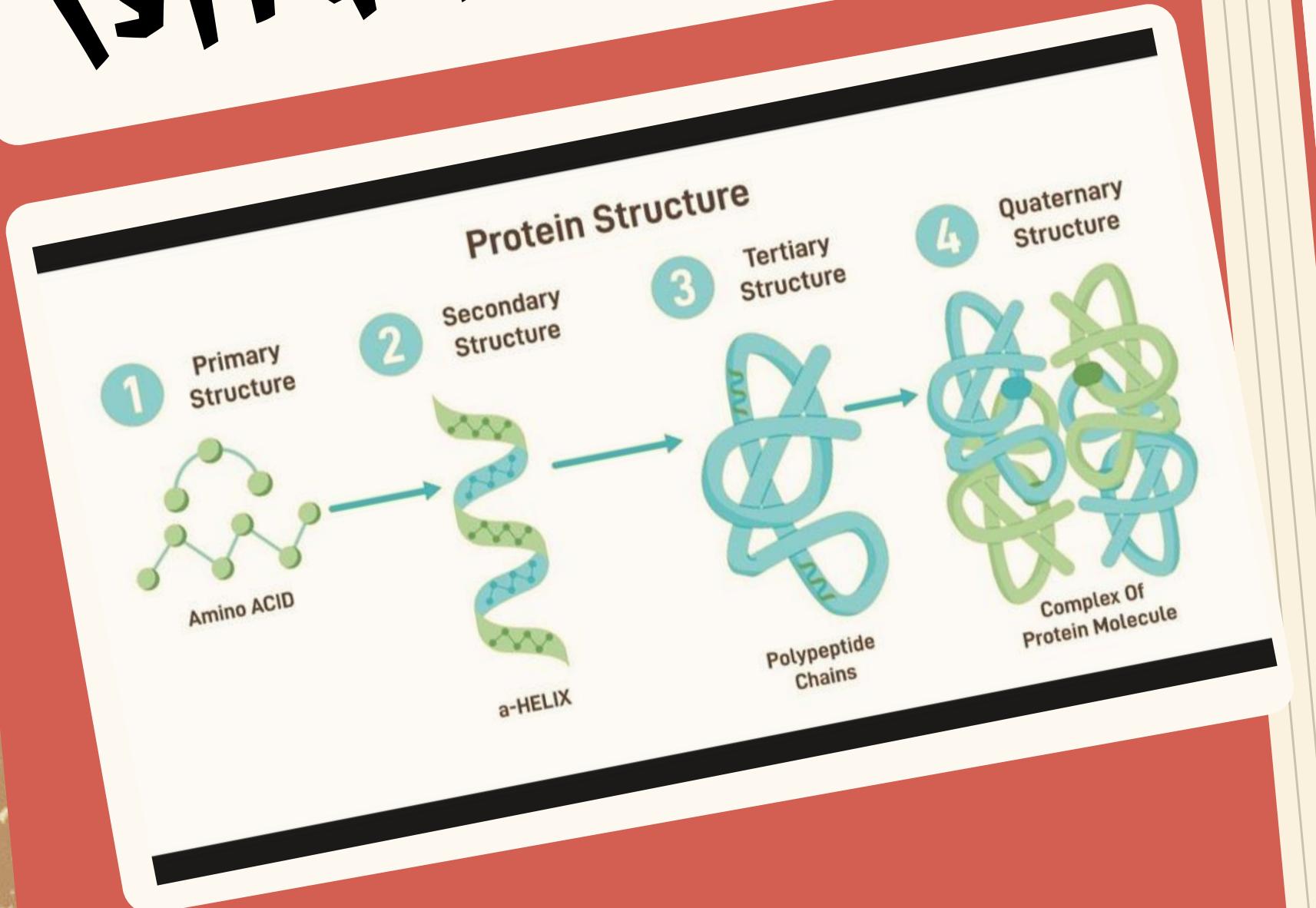
The Ribosome reads the mRNA code and snaps amino acids together in the right order.





DNA to Protein

# The Art of Folding (Structure Levels)



**Primary Structure:** The straight chain of amino acids (The Polypeptide).

\* **Secondary Structure:** The chain starts to twist into spirals (Alpha-helix) or sheets (Beta-sheet).

\* **Tertiary Structure:** The 3D folding creates the final functional shape.

\* **Quaternary Structure:** Multiple folded chains come together (e.g., Hemoglobin).

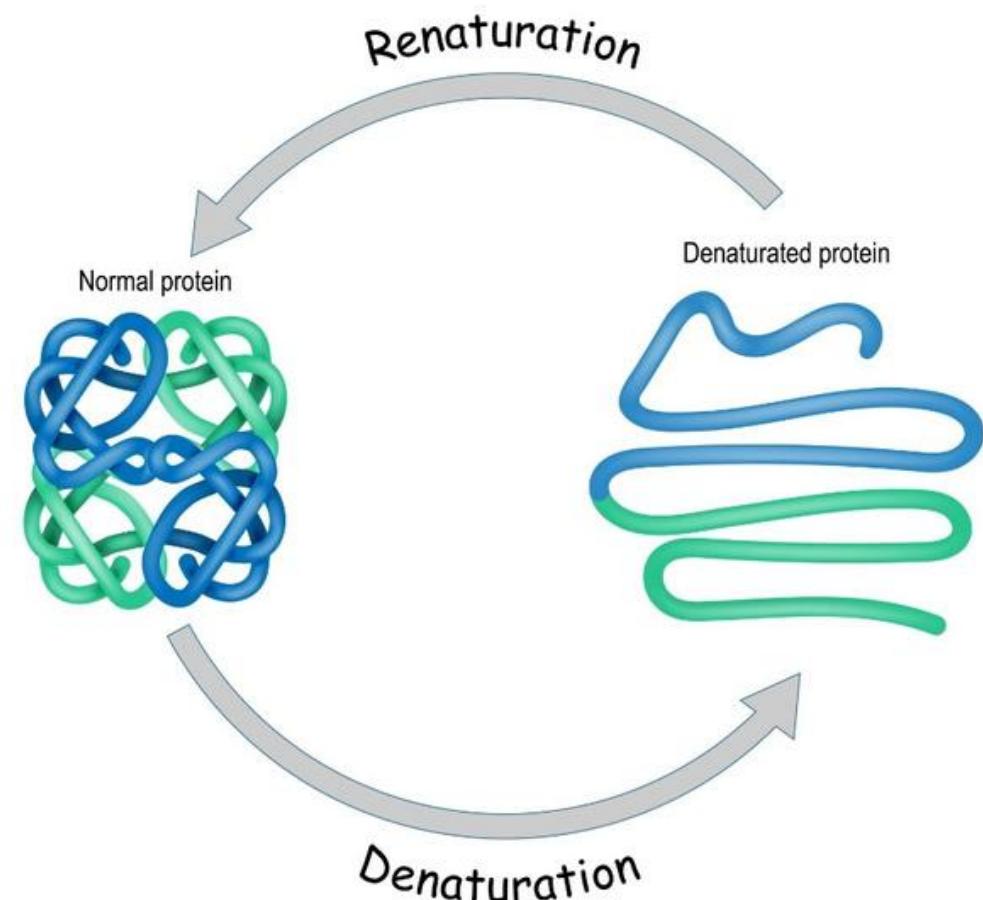
\* **Key Point:** "Structure determines Function."

# The Disadvantages (Fragility)

\* **Note:** Proteins are powerful, but they are very sensitive

- \* **Denaturation:** If the environment changes, the protein unravels and loses function.
- \* **Temperature Sensitivity:** High heat destroys proteins (e.g., cooking an egg turns it solid/white).
- \* **pH Sensitivity:** Changes in acidity can break the bonds holding the fold together.
- \* **Energy Cost:** Making and folding proteins consumes a huge amount of the body's energy (ATP).
- \* **Visual:**

DENATURATION and RENATURATION  
of proteins



# Misfolding

(when it goes wrong)

- \* The Problem:  
Sometimes  
proteins fold into  
the wrong shape.

## Causes

- \* Genetic Mutation: A typo in the DNA code.
- \* External Stress: Toxins, heat, or radiation.
- \* Crowding: The cell is too crowded, and the protein bumps into others before it is ready.
- \* Result: The protein becomes useless or toxic "junk."

# The "Dark Side" **(Diseases)**

- \* **Aggregation:** Misfolded proteins tend to be sticky.
  - They clump together to form Plaques.
- \* **Alzheimer's Disease:** Caused by Amyloid-beta plaques in the brain.
- \* **Parkinson's Disease:** Caused by clumps of alpha-synuclein.
- \* **The Impact:** These clumps kill nerve cells, leading to memory loss and loss of motor control.

# The "Zombie" Protein (Prions)

This is your  
"Curious/Exciting" topic.

\* **What is a Prion?**  
A misfolded protein that  
is infectious.

## \* How it works:

-It contains no DNA or RNA. It touches a healthy protein and forces it to misfold, creating a chain reaction (like a Zombie bite).

\* **Examples:** Mad Cow Disease,  
Creutzfeldt-Jakob Disease (CJD).

## Conclusion

## & The Future

\* **Defense:** Our bodies have Chaperones (helper proteins) that try to fix misfolded proteins.

## \$ \_Technology and Summary — \$

\* **Technology:** AI like AlphaFold is now predicting protein shapes to help design new drugs.

\* **Summary:** Proteins are the delicate nanobots of life. Understanding their folding is the key to curing deadly diseases.

\* Q&A



Any  
Questions

# THE PRESENTATION IS DONE!



## THANKS FOR YOUR ATTENTION!

<https://kunal-gupta-1107.github.io/Shiva-Ideas/>

