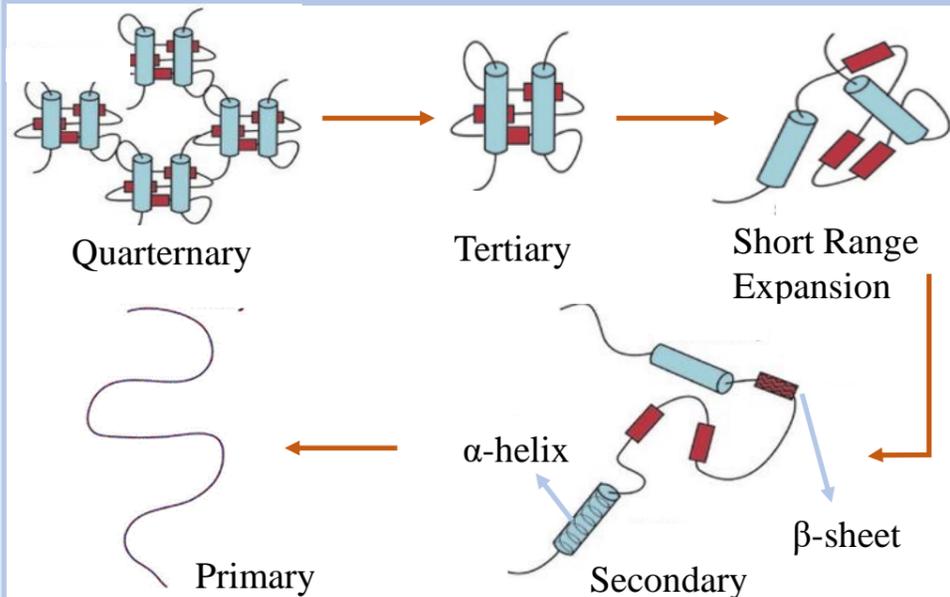


# HOW DOES PROTEIN DENATURATION OCCUR?

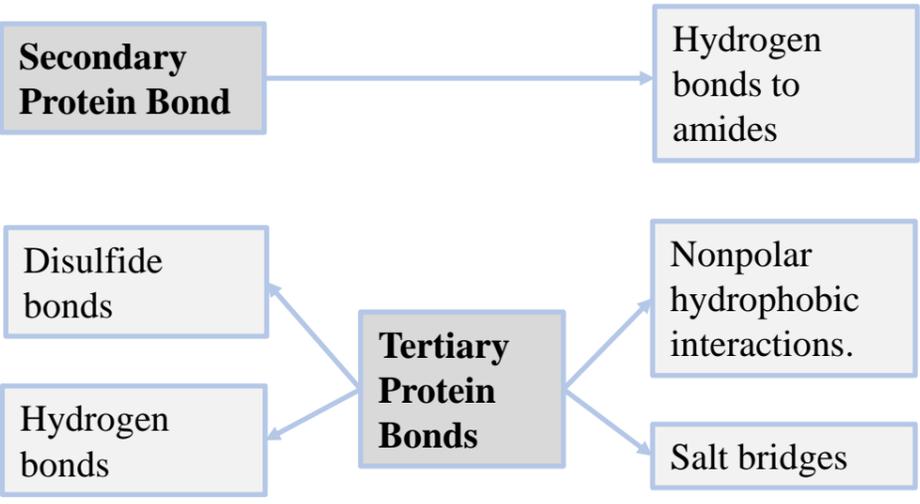
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**INTRODUCTION:** Most proteins have a sensitive structure which can be disrupted by specific substances and conditions. These disruptions damage the structural shape of proteins and cause protein to lose its functioning. This biological event is called denaturation.

## BIOLOGICAL BACKGROUND OF DENATURATION

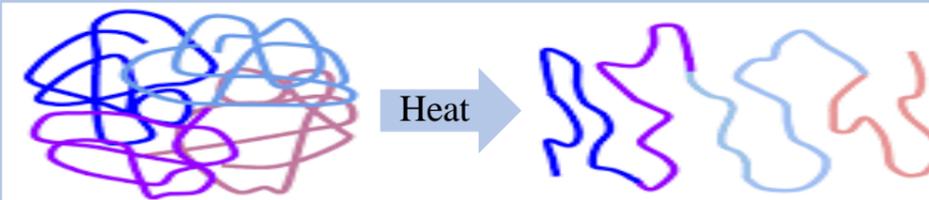


Denaturation of proteins disrupts both secondary and tertiary structures and causes destruction. Since denaturation reactions are not strong enough to break peptide bonds in the primary structure, the primary structure (amino acid sequence) remains the same after a denaturation. Denaturation process disrupts the normal alpha-helix and beta leaves in the protein structure and puts them in a random shape.



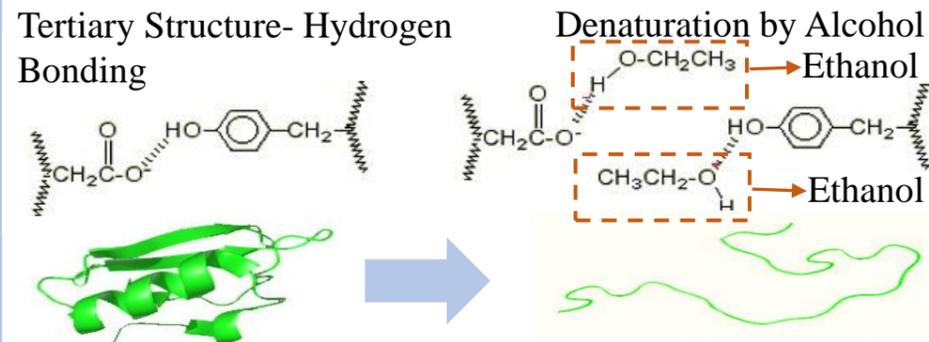
## FACTORS OF DENATURATION

### HEAT



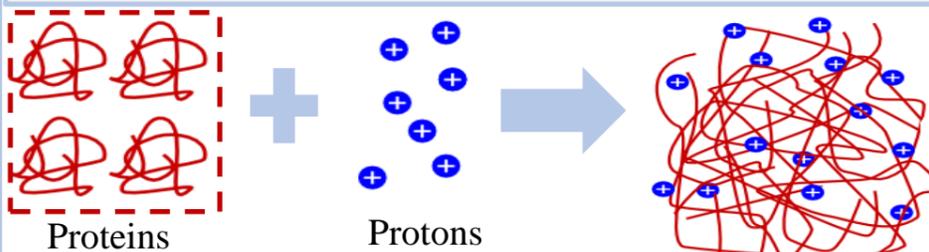
Heat can be used to break hydrogen bonds and non-polar hydrophobic interactions. Because heat increases kinetic energy, it allows molecules to vibrate quickly and violently enough to break bonds.

### ALCOHOL



Hydrogen bonding occurs between amide groups in the secondary protein structure. All of these are disrupted by the addition of another alcohol.

### ACID & BASE



Protonation of the residues of amino acids changes have the potential to denature the protein without depending on its participation of hydrogen bonding.

## CONSEQUENCES

- Protein denaturation is used for sterilization of medical equipment and the production of dairy products.
- Proteins in cooked foods become denatured and their digestion becomes easier.
- Enzymes are proteins that speed up reactions. Denaturation disrupt their structure and prevent them to perform their function.
- In a living cell it leads to interruption of cell activity and cell death.

## CONCLUSION

- Denaturation occurs because of the disruption of the bonding interactions which are responsible for the secondary structure and the tertiary structure.
- On the other hand, some denaturation techniques are used in medicine as they have disinfectant properties, such as heavy metal salts are used to prevent Gonorrhoea infections in the eyes of babies.

## REFERENCES

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