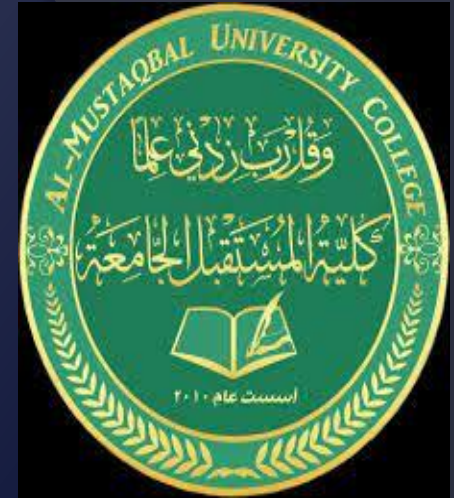


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# POST TRANSLATIONAL MODIFICATION OF POLYPEPTIDE

# note

- ⦿ Genetic Code ----amino acid -----proteins
- ⦿ Proteins may be enzyme , hormones
- ⦿ Modification(change in chemical structures include 1.AAd 2.removol
- ⦿ Proteins synthesis in Ribosomes
- ⦿ Proteins produced in Rough endoplasmic Reticulum.
- ⦿ Modification in Golgi apparatus and RER.

# outline

1\_introduction (post translational modification of protein ).

2\_Causes post translational modification of protein

3\_Types of post translational modification of protein

A.Phosphorylation .

B.Glycosylation .

C.hydroxylation .

D.other covalent modifications

# Introduction

- ⦿ Post translational modification of protein
- ⦿ It is chemical modification of protein after its translation
- ⦿ Covalently modified either they are still attached the ribosomes **or** after their synthesis has been completed.
- ⦿ Modification by **Trimming** and **covalent alterations**

# Trimming

- Removed by specialized end proteases resulting in the release of an active molecule .
- Convert from inactive into active .
- EX:Trypsinogen(zymogen) convert into Trypsin.
- **Zymogen** :are inactive precursors of secreted enzymes.

# Covalent alterations

- Proteins ,both enzymatic and structural may be activated or inactivated by the covalent attachment of variety of chemical groups.

# Causes posttranslational modification of protein

- ① 1\_folding of the protein.
- ② 2\_Increase the stability .
- ③ 3.convert inactive into active or active convert into active
- ④ 4.Alter the biological activity of the protein
- ⑤ 5.mark proteins for degradation

- ⦿ **A.Phosphorylation**
- ⦿ Addition of phosphate group to a protein by kinase enzyme
- ⦿ Principally on serine ,threonine or tyrosine residues
- ⦿ Also know as phosphor regulation.
- ⦿ Phosphorylation may increase or decrease the functional activity of the proteins .



# Phosphorylation

Phosphate



Serine

Protein



Tyrosine

## B. Glycosylation

- ⦿ The covalent attachment of oligosaccharides
- ⦿ Addition of **glycosyl group** or **carbohydrate group** to a protein
- ⦿ Principally on Asparagine, hydroxylysine, serine or threonine
- ⦿ Occurs in **endoplasmic reticulum** and **Golgi apparatus**

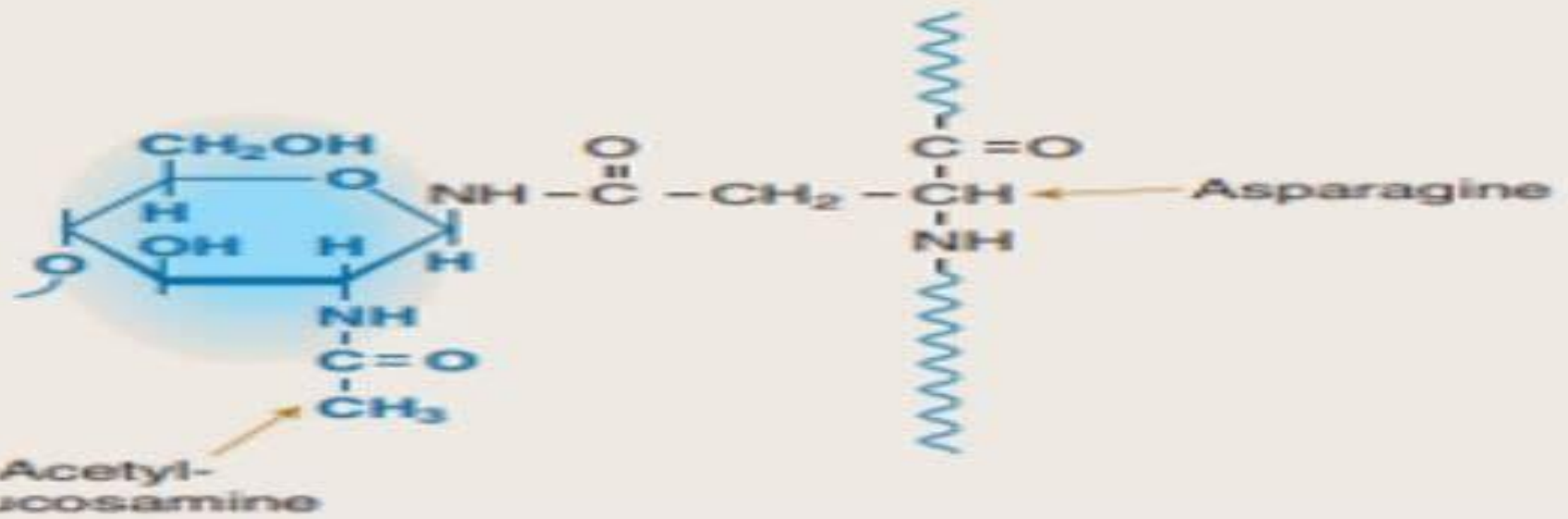
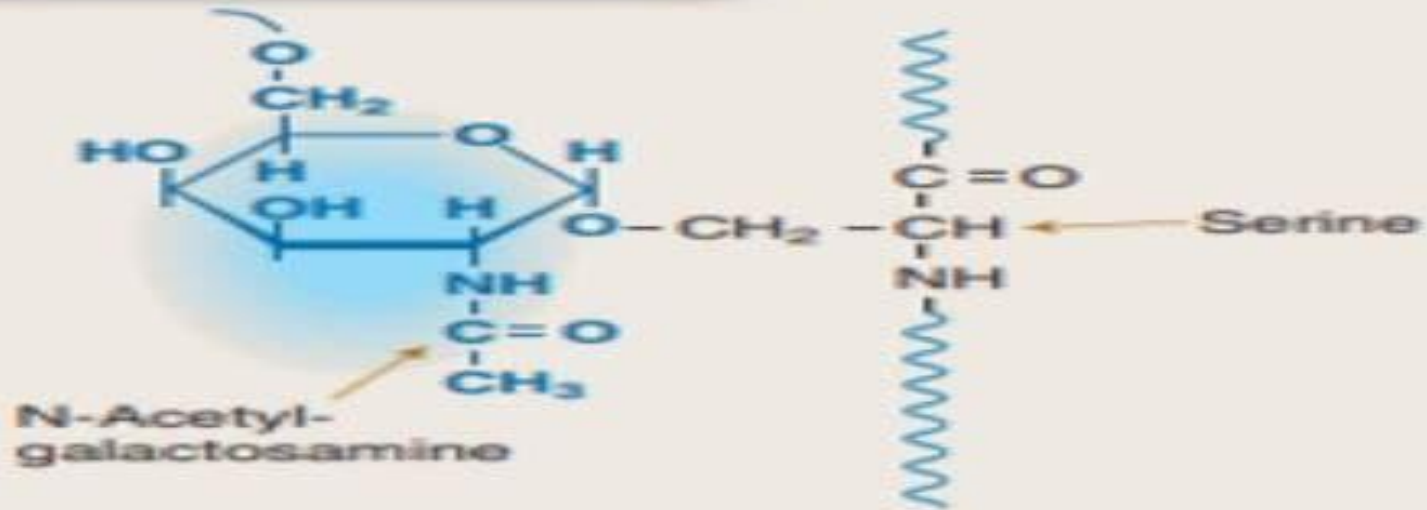
# c-Hydroxylation

- ⦿ Proline and lysine residues of the alfa chains of collagen are extensively hydroxylated in the endoplasmic reticulum

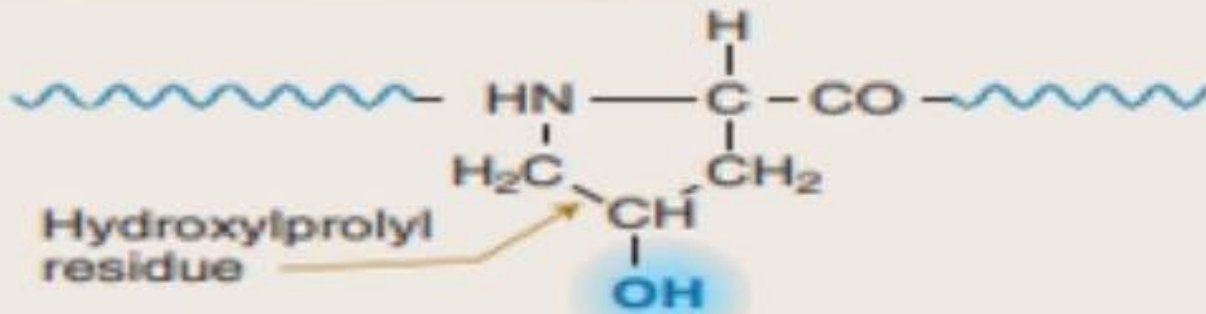
## D-Other covalent modifications

- ⦿ Additional **carboxyl groups** can be added to glutamate residues by vitamin k-dependent carboxylation
- ⦿ It is **essential** for activity of several of the **blood clotting proteins** .

# Glycosylation



## Hydroxylation



## Carboxylation

