

LESSON PLAN

ON

CLASSIFICATION OF AMINO ACIDS

BY

MS ARUNA ALPHONSA

CLINICAL INSTRUCTOR

IDENTIFICATION DATA

NAME : **MS. Aruna**
DESIGNATION : **Clinical Instructor**
SUBJECT : **Biochemistry**
TOPIC : **Classification of Amino Acids**
DURATION OF TEACHING : **45 MINUTES**
METHOD OF TEACHING : **Lecture cum Discussion**
A.V AIDS : **PPT**

GENERAL OBJECTIVE :-

After class students will be able :

To acquire knowledge on the topic "**Classification of Amino Acids**".

S.No	SPECIFIC OBJECTIVES	CONTENT	TIME	TEACHING/ LEARNING ACTIVITY	A.V AIDS	EVALUATION
1.		<p><u>INTRODUCTION</u></p> <p>Good afternoon students. Today we would be learning about Classification of Amino Acids.</p>	30 sec			
2.	Define Amino Acids.	<p style="text-align: center;"><u>Definition of Amino Acids</u></p> <p><u>Amino Acids</u>: Amino acids are a group of organic compounds containing two functional groups- amino and carboxyl. The amino group (-NH₂) is basic while carboxyl group (-COOH) is acidic in nature.</p>	3 min	Lecture cum discussion	White board OHP	Define amino acids
3.	Classify amino acids on basis of polarity.	<p><u>Classification of Amino Acids based on polarity</u>: Amino acids are classified into 4 groups based on their polarity. The Polarity, in turn, reflects the functional role of amino acids in protein structure.</p> <ol style="list-style-type: none"> 1. Non Polar Amino acids – These amino acids are also referred to as hydrophobic. Example: Alanine and Leucine. 2. Polar Amino Acids with no charge on 'R' group. Example: glycine and serine 3. Polar amino Acids with positive 'R' group. Example Lysine, arginine, and histidine. 4. Polar Amino acids with Negative 'R' group. Example Aspartic acid and Glutamic acid. 	10 min	Lecture cum discussion	Power Point	Classify amino acids on basis of polarity

4.	Distinguish amino acids on basis of functional group.	<p><u>Classification on the basis of functional group:</u></p> <p>Three groups depending on their reactions in solution.</p> <ul style="list-style-type: none"> ▪ Acidic amino acids – Carry net negative charge at Ph 6.0 ▪ Basic amino acids – Carry net positive charge at Ph 6.0 ▪ Neutral amino acids – Carry no net charge at PH 6.0 <p>Under neutral amino acids comes:-</p> <ul style="list-style-type: none"> • Aliphatic amino acids – These are mono amino mono carboxylic acids. Example glycine and alanine. • Aromatic Amino Acids – example Phenylalanine and tyrosine. • Imino acids – example : Proline 	10 min	Lecture cum discussion	OHP	Distinguish amino acids on basis of functional group.
5.	Categorize amino acids on basis of nutritional requirement.	<p><u>Classification on the basis of Nutritional Requirement:</u></p> <p>Dietary importance of amino acids</p> <p>Although a large number of amino acids occur in nature only 20 of them are found in human body and they are classified as follows:</p> <ul style="list-style-type: none"> ✚ Essential Amino Acids ✚ Non Essential Amino Acids ✚ Semi Essential Amino Acids <p><u>Essential Amino Acids</u></p> <ul style="list-style-type: none"> • These cannot be synthesized by the body. • They need to be supplied in form of dietary protein • Examples : Valine, Leucine, Isoleucine, Lysine etc. 	5 min	Lecture cum discussion	OHP Power Point Slides	Categorize amino acids on basis of nutritional requirement.

		<p><u>Non Essential Amino Acids</u></p> <ul style="list-style-type: none"> • These can be synthesized in the body. • They are not required in diet. • Also known as dispensable amino acids • Examples: Glycine, Serine, Cysteine, Alanine, proline etc. <p><u>Semi Essential Amino Acids</u></p> <ul style="list-style-type: none"> • These are growth promoting factors. • They can be synthesized by adults and not by growing children. • Includes Arginine and Histidine. 				
6	Enlist amino acids on basis of nature of metabolic end products.	<p><u>Classification based on Metabolic end product:</u></p> <ul style="list-style-type: none"> • Ketogenic amino acids – yield acetyl CoA or Acetoacetyl CoA as metabolic end. Fats can be synthesized from the amino acids. eg. Leucine and lysine • Glucogenic amino acids – yield pyruvate or any intermediate of TCA cycle. Example isoleucine, Phenylalanine • Glucogenic and Ketogenic Amino acids- yield breakdown product that can act precursor of glucose and ketone bodies. Example: Isoleucine, tryptophan 	5 min	Lecture cum discussion	Whiteboard OHP	Enlist amino acids on basis of nature of metabolic end products.
		<p><u>Teaching Plan</u></p> <ul style="list-style-type: none"> • Amino acids are organic compounds containing two 				

functional groups.

- Amino acids are classified into 4 groups based on their polarity that is Polar, Non- Polar, Polar with Positive charge and negative charge.
- Amino acids are classified into Acidic, basic and neutral based on the functional group.
- It's also classified into essential and Non-Essential types as per the nutritional requirements.

SUMMARY

Today we have studied about classification of amino acids on basis of its polarity, nutritional requirements, functional group and nature of metabolic end products.

CONCLUSION

Hope you all have understood the topic and would apply this knowledge in clinical practice.

LESSON PLAN

ON

Classification

of

Amino Acids

NAME OF THE TEACHER: Ms. Aruna Alphonsa

NAME OF THE COURSE: B.Sc. (H) Nursing 1stYear – Second Semester

NAME OF THE SUBJECT: Biochemistry

NAME OF THE UNIT: Unit III (Proteins)

NAME OF THE TOPIC: Classification of Amino Acids

DATE & TIME:

DURATION: 45 Minutes

PREVIOUS KNOWLEDGE: Students have little knowledge about topic from previous classes

METHOD OF TEACHING: Lecture cum Discussion

AV AIDS: OHP, Whiteboard, PowerPoint slides

GENERAL OBJECTIVE: At the end of the class, students will gain in depth knowledge about classification of amino acids on basis of its polarity, nutritional requirements, functional group and nature of metabolic end products.

SPECIFIC OBJECTIVE: At the end of the class, students will be able to:

1. Define amino acids.
2. Classify amino acids on the basis of Polarity of R group.
3. Distinguish amino acids on the basis of functional group
4. Categorize amino acids on the basis of nutritional requirements.

5. Enlist amino acids on the basis of nature of metabolic end products.

REFERENCE:

Munjal Puneet, Applied Biochemistry, Saurabh Medical publishers, Second Edition (2023) Pg No – 84 to 86

Singla Shweta, Medical Biochemistry for nurses, Kumar publishers, Second Edition (2019) Pg No – 152 to 154