**CHEM121 – BIOCHEMISTRY FOR NURSES**

**Lesson 8 – Worksheet**

1. Fill in the blank spaces below.

The linking of 2 or more amino acids forms a **\_\_\_\_\_\_\_\_\_\_.**

A **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is an amide bond that forms when the –COO- group of one amino acid reacts with the –NH3+ group of the next amino acid.

        The amino acid on the left end of a peptide with an unreacted free amino group is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** amino acid.

        The amino acid on the right end of a peptide with an unreacted free carboxyl group is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** amino acid.

**Classification of peptides:**

        **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** = 2 amino acids linked together

        **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** = 3 amino acids linked together

        **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** = 4-9 amino acids linked together

        **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** = 10-50 amino acids linked together

2. Use the diagram below to draw the dipeptides listed.

(a) Carnosine (alanylhistidine) - a dipeptide which is highly concentrated in muscle and brain tissues.

 

(b) Kyotorphin (tyrosylarginine) - a neuroactive dipeptide which plays a role in pain regulation in the brain.

  

(c) Aspartame (aspartylphenylalanine) – a dipeptide which is an artificial sweetener.



3. A **tripeptide** is a [peptide](https://en.wikipedia.org/wiki/Peptide) consisting of three [amino acids](https://en.wikipedia.org/wiki/Amino_acids) joined by [peptide bonds](https://en.wikipedia.org/wiki/Peptide_bond). Draw the tripeptide [Val](https://en.wikipedia.org/wiki/Valine)-[Gly](https://en.wikipedia.org/wiki/Glycine%22%20%5Co%20%22Glycine)-[Ala](https://en.wikipedia.org/wiki/Alanine%22%20%5Co%20%22Alanine)

  

 4. The diagram below represents a portion of a protein structure **Ala-Tyr-Asp-Gly.**



(a) Circle ALL the peptide bonds shown in the diagram.

(b) Circle the R group of a polar amino acid and label it ‘P’.

(c) Circle the R group of a non-polar amino acid and label it ‘NP’.

(d) Circle the R group of an acidic amino acid and label it ‘A’.

(e) Label the N terminus ‘N’.

(f) Label the C terminus ‘C’.

(g) What is the name of the reaction which forms peptide bonds?

(h) How many water molecules were produced in the reaction above?

(i) Is the peptide above a tripeptide, a tetrapeptide, a pentapeptide or a hexapeptide?