

Bexhill 6th Form College

# Biological Molecules Workbook

Name: \_\_\_\_\_

## Amino acids

Research and present the key information on 3 amino acids of your choice:

With the aid of labelled formula describe the general structure of amino acids:

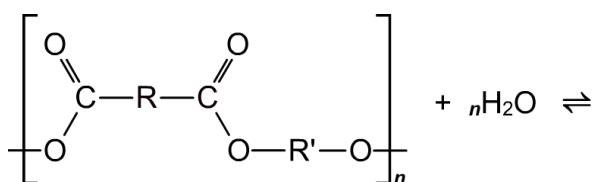
Draw a zwitterion in neutral conditions, acidic conditions and alkali conditions

Define 'isoelectric point' and give examples

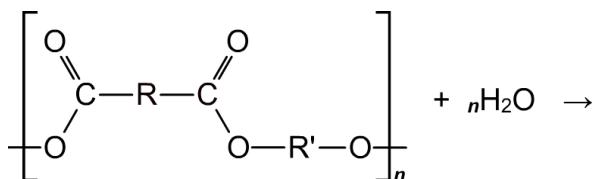
Show how a dipeptide is formed from serine and cysteine. Explain the process.

Draw the monomers and polymer formed with the reaction of alanine and glycine

Draw the products of the acid hydrolysis (reflux with dilute HCl/H<sub>2</sub>SO<sub>4</sub>) of the following:



Draw the products of the alkali hydrolysis (reflux with dilute NaOH) of the following:



Complete summary questions on page 359

*Teacher signed:* \_\_\_\_\_

### Evaluation

#### Plus (My strengths)

- 1.
- 2.

#### Minus (My areas for development/I need assistance with)

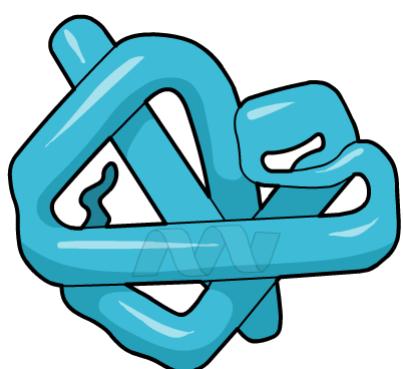
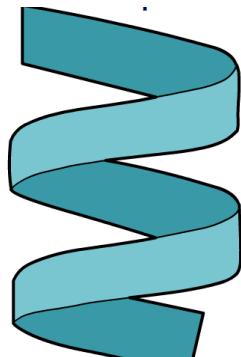
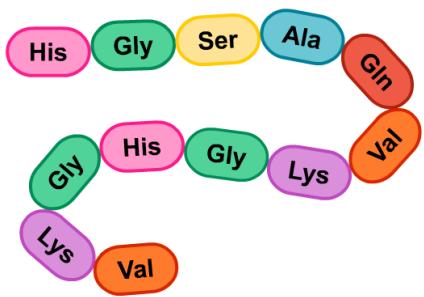
- 1.
- 2.

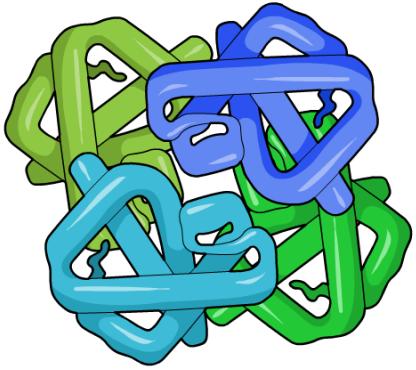
#### Interesting (What did you find most interesting in this topic)

- 1.
- 2.

## Proteins

Label the following as either primary, secondary, tertiary or quaternary and describe the structure of each:





Explain the role of intermolecular bonds in determining the secondary and tertiary structures, and hence the properties of proteins

Secondary:  
( $\alpha$  helix)

$\beta$  Pleated sheet

Tertiary

Complete summary questions on page 363

*Teacher signed:* \_\_\_\_\_

### Evaluation

#### **Plus (My strengths)**

- 1.
- 2.

#### **Minus (My areas for development/I need assistance with)**

- 1.
- 2.

#### **Interesting (What did you find most interesting in this topic)**

- 1.
- 2.

## **Enzymes**

Describe and explain the specificity of enzymes

Describe the characteristics of enzyme catalysis, including:

- Specificity
- temperature sensitivity
- pH sensitivity,
- competitive inhibition

Explain these characteristics of enzyme catalysis in terms of a three-dimensional active site (part of the tertiary structure)

Research the use and action of Captopril.

- What is it used for
- Description of its action
- Labelled diagrams
- Use the terms *Pharmacophore* and *side-chain modification*

Explain molecular recognition in terms of the pharmacophore and groups that modify it

Complete summary questions on page 369 and 372

*Teacher signed:* \_\_\_\_\_

#### Evaluation

**Plus (My strengths)**

- 1.
- 2.

**Minus (My areas for development/I need assistance with)**

- 1.
- 2.

**Interesting (What did you find most interesting in this topic)**

- 1.
- 2.

## DNA

Draw the 3 structures that make up DNA (draw a simplified base)

Using diagrams explain how a nucleotide is formed and hence how DNA strands are formed

Compare and contrast DNA and RNA in terms of structure

Draw the four bases present in DNA and RNA

Describe how two strands of DNA form a double-helix structure through base pairing

Explain how and why base pairing is specific with reference to hydrogen bonding

Describe how two strands of DNA form a double-helix structure through base pairing

Explain how DNA encodes for RNA which codes for an amino acid sequence in a protein

Complete summary questions on page 379

*Teacher signed:* \_\_\_\_\_

### Evaluation

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- 1.
- 2.

#### **Minus (My areas for development/I need assistance with)**

- 1.
- 2.

#### **Interesting (What did you find most interesting in this topic)**

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- 2.