

# Molcraft – Molecules in Minecraft

## Answers



## Session 2: Protein quiz answers

**1) What does proteinogenic mean?**

Proteinogenic means 'protein building'. The proteinogenic amino acids are used to construct proteins.

**2) What part of an amino acid is variable?**

The sidechain varies. It can be as small as a single hydrogen atom (as in glycine) or large ring structures (like in tryptophan). All amino acids have a carboxyl (acidic group) and an amino group (-NH<sub>2</sub>). So strictly speaking proline isn't actually an amino acid at all.

**3) What does the iron in myoglobin do?**

It binds to oxygen atoms.

**4) How many irons are there in a molecule of haemoglobin?**

Four.

**5) What types of secondary structure do you find in a) aquaporin b) immunoglobulin c) lysozyme?**

a) alpha helices

b) beta-strands (or sheets)

c) both alpha helices and beta-strands.

**6) Where is glucagon made?**

In the liver.

**7) What molecule does aquaporin allow to pass through cell membranes?**

Water.

**8) Where in the body do you find myosin?**

In muscles.



## Session 3: Amino acid quiz answers

**1) What does 'hydrophobic' mean?**

Hydrophobic means molecules don't like being in contact with water. For example oil is hydrophobic so it doesn't mix well with water and forms a layer on water surfaces.

**2) Which amino acid gets its name from asparagus?**

Asparagine, because it was first isolated from asparagus.

**3) Which two amino acids are used to make aspartame?**

Aspartate and phenylalanine when linked together by a peptide bond form aspartame.

**4) How many carbon, hydrogen and oxygen atoms are there in glycine?**

2 carbons, 5 hydrogens, 2 oxygens. There is also 1 nitrogen.

**5) Which amino acids have rings for sidechains?**

Histidine, tyrosine, phenylalanine and tryptophan have rings for sidechains. Proline doesn't count because part of its ring is formed from the backbone.

**6) Which amino acids do you have to get from your diet?**

The essential amino acids are:

Arginine, cysteine, glycine, glutamine, proline and tyrosine.

**7) Which amino acid gets its name from the Latin for silk?**

Serine, because it was first isolated from silk.

**8) Which amino acids have alcohol groups in their sidechains?**

Serine and threonine have alcohol (-OH) groups in the sidechains.

**9) Which amino acids have sulfur in their side chains?**

Methionine and cysteine.

**10) Write out the 1 letter code for the amino acids cysteine, histidine, glutamate, methionine, isoleucine, serine, threonine, arginine and tyrosine. What word does it spell?**

Chemistry.



## Session 4: RSC quiz answers

1) **What atom only appears once in penicillin?**

Sulfur (the yellow one).

2) **How many atoms of oxygen are there in a molecule of RDX explosive?**

Six.

3) **What is haloethane?**

An anaesthetic.

4) **What was the name of the man who invented the molecules that made LCD screens possible?**

Prof George Gray.

5) **What did Rosalind Franklin work on?**

Working out the structure of DNA.

6) **Who discovered carbon dioxide?**

Joseph Black.

7) **Where was Viagra invented?**

Pfizer, at Sandwich in Kent.

8) **How many rings does Viagra have?**

Four.

9) **What is a dalton?**

The unit of atomic weight.

10) **What colour is the 1st synthetic dye?**

Mauve or purple.

