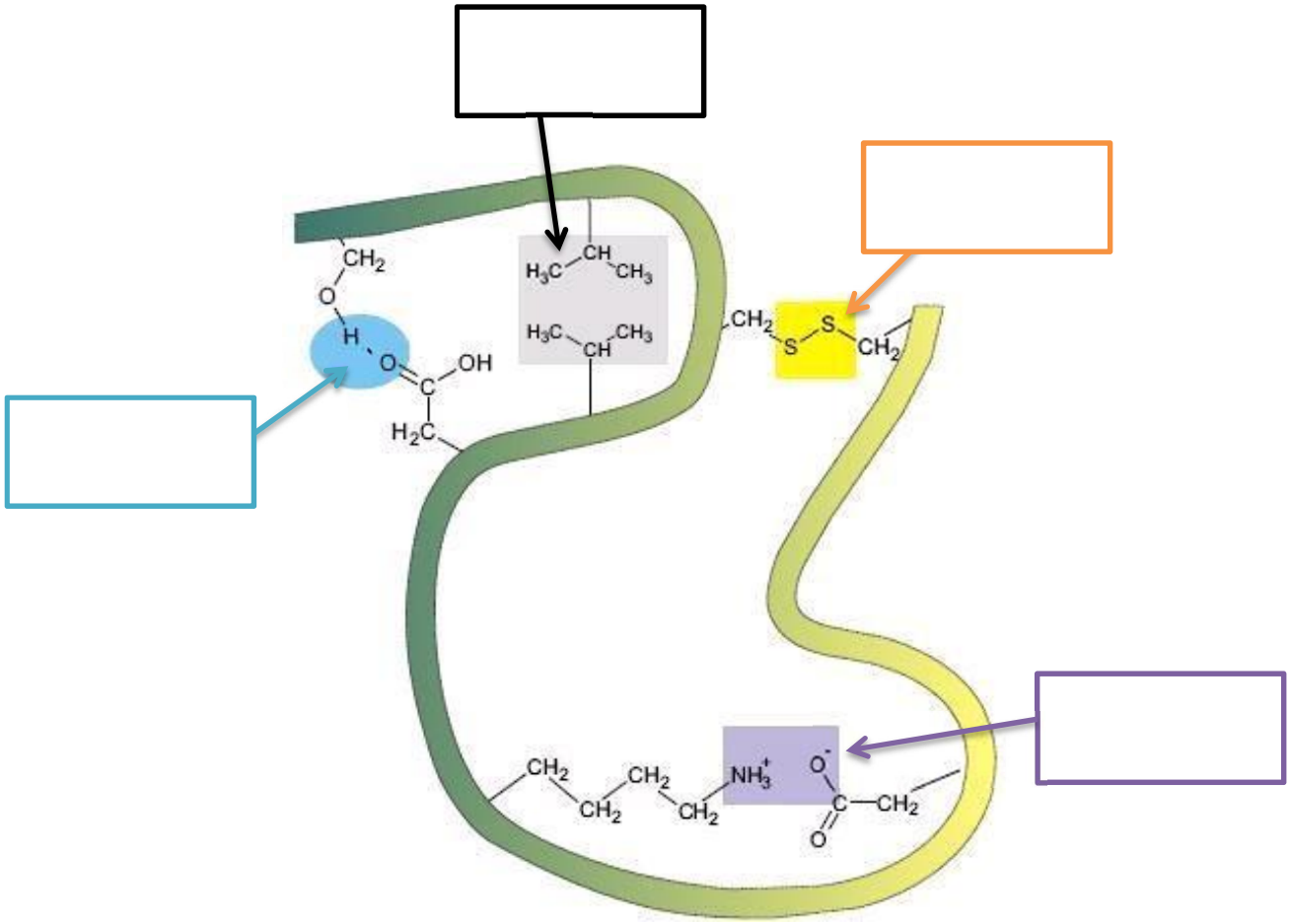
Name:
Date:

QA2 – Amino Acid Interactions

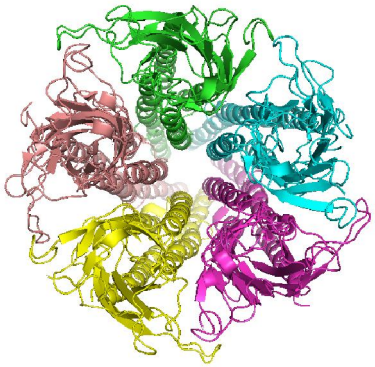
1. The diagram below shows a small section of a protein, with different amino acid residues extending out from the polypeptide backbone. Label the different types of interaction which are holding the tertiary structure in place.

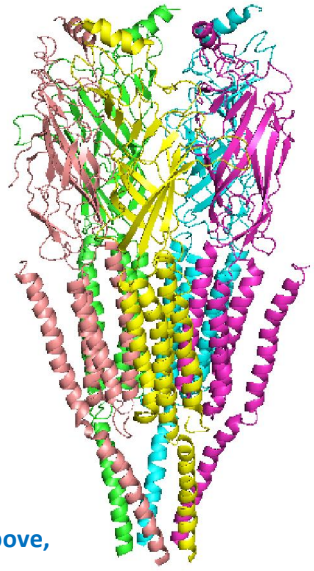


2. Using your answers to Q1., explain why the diversity of amino acid side chains is so important to the overall shape and structure of a protein.

Produced by Lucy Jakubecz at Newcastle University as part of an MChem project.
Edited by Adam Stubbs at Newcastle University as part of a summer outreach project.

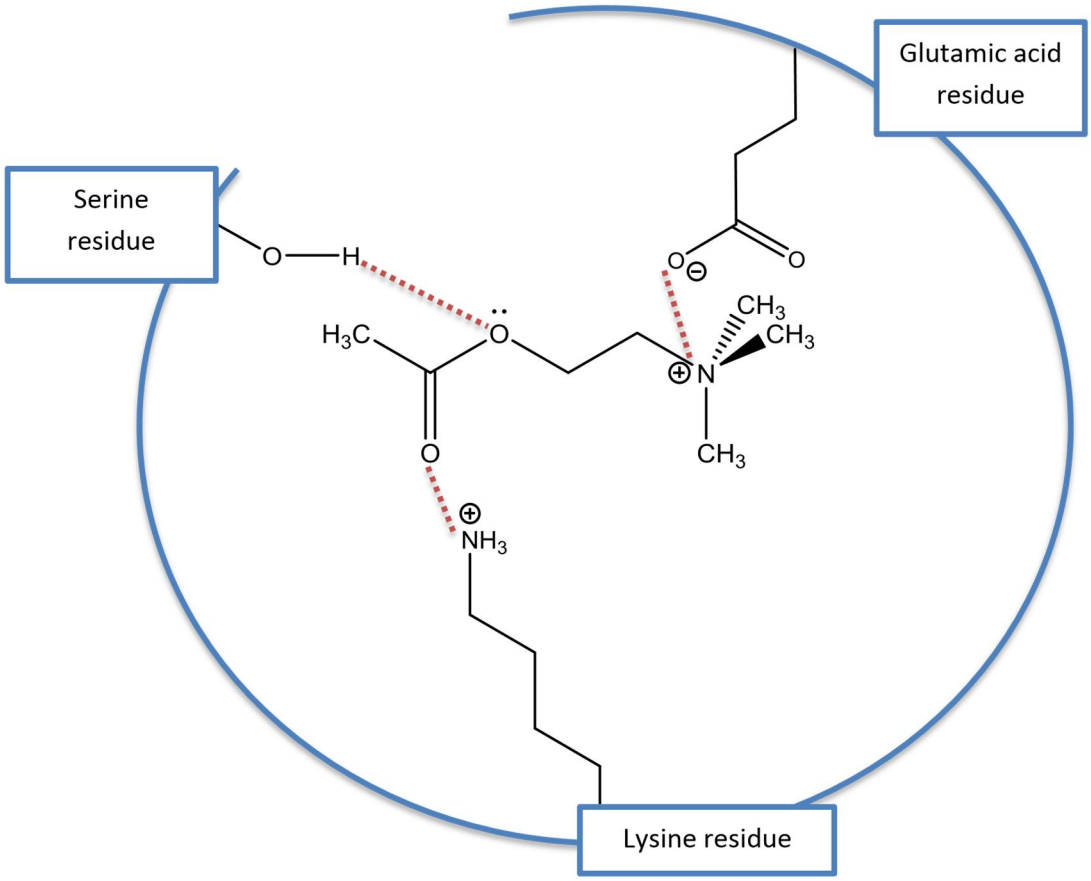
Acetylcholine (ACh) is a **neurotransmitter** that acts on the central nervous system. Neurotransmitters send signals across the synapses between neurons, allowing neurons to communicate with each other. This allows signals from the central nervous system to be relayed to muscles and glands in the body. Acetylcholine receptors are proteins which act as **ion channels**. This means that in their normal resting state, the channel is closed, and no ions can pass though. But when two ACh molecules bind to an acetylcholine receptor, the protein changes shape, and the ion channel opens. This allows ions to flow, which can then interact with muscles, telling them to contract.





An acetylcholine receptor shown from above, and the side. PDBe entry 2bg9.

3. The diagram below shows how ACh specifically binds to the active site of a receptor. Label the interactions occurring between the amino acid residues and the ACh molecule (centred).



Produced by Lucy Jakubecz at Newcastle University as part of an MChem project.
Edited by Adam Stubbs at Newcastle University as part of a summer outreach project.