Name:
Date:

WA9 – Histones, Superhelices, and Quaternary Structures

Download and then open the file, **1aoi_Superhelices_Animation** using PyMOL. This particular structure contains a DNA double helix, which is itself wrapped in a helix around a collection of α-helices. This is a type of protein called a histone, which wraps and orders DNA into chromosomes.

1. The central protein in this macromolecule is made from many α-helices, which are held together by hydrogen bonds. What would happen to the secondary structure of the polypeptide chains if these hydrogen bonds were removed? **Select Protein_polar_conts** to visualise them.

2. What would happen to the quaternary structure of the protein if these hydrogen bonds were removed?

3. What would happen to the primary structure if these hydrogen bonds were removed?

4. Using your knowledge of proteins, explain why the amino acids which constitute a protein have formed this particular shape and structure. Include in your answer: Primary, Secondary, Tertiary, and Quaternary Structure. Condensation. Hydrogen bonding. α-helices. Polypeptide.

Produced by Adam Stubbs at Newcastle University as part of a summer outreach project.

5. Using your knowledge of DNA, explain why the nucleotides which constitute it have formed into a double helix structure. Include in your answer: Nucleotide. Base. Double Helix. Complementary. Condensation. Ribose.