CONCEPT: APPROXIMATING PROTEIN MASS

●Each amino acid has a unique _____ (except for Leu & Ile).

□ Calculating the _____ mass of a protein can be cumbersome.

●Mass of a protein can be easily _____ with *only* the total number of amino acid residues.

1) Average molecular weight (MW or M_r) of the 20 *free* α-amino acids (~_____ grams/mole).

2) _____ is lost with the formation of each peptide bond to link an amino acid (H_2O MW = _____ g/mole).

□ Makes average MW of amino acid *residues* _____ g/mole.

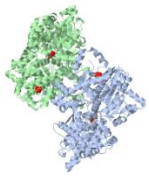
$$\text{Approximate Mass of a Protein} \approx (\text{Total \# of aa})(\_\_\_\_\ \text{g/mole})$$

EXAMPLE: Determine the approximate MW of a protein containing 200 amino acids.

a) 17,000 g/mol b) 10,000 g/mol c) 22,000 g/mol d) 222,000 g/mol

PRACTICE: What is the approximate M_r of the enzyme glycogen phosphorylase, which has 842 amino acid residues?

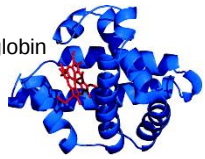
a) 99,520 b) 92,620 c) 207,941 d) 178,600



Glycogen Phosphorylase MW = ?

PRACTICE: Myoglobin is an oxygen-storage protein in muscle tissues. If its molecular weight is 16.7 kDa (1 Da = 1 g/mol), *about* how many amino acid residues does myoglobin have?

a) 86 b) 134 c) 208 d) 153



Myoglobin