Rituparna Sinha Roy

21/2/2019

Structural Biology Theory Exam (LS4201 exam)

Midsem Exam; Date: Feb 21 2019; Time : 10.00-11.30AM.; Total marks: 20

Room No. APC Ray 103

Instructor's name: Dr. Rituparna Sinha Roy

Name:

Roll No.:

Answer ALL questions

Q1	Q2	Q3	Q4	Q5	Q6	Full marks (20)

1.The following sequences are the structure of helices:

Boc- Val1-Ala2-Leu3-Aib4-Val5-Leu6-Aib7 -OMe (rigt handed helix; helix 1)

Boc- ^{D}Val1-^{D}Ala2-^{D}Leu3-Aib4-^{D}Val5-^{D}Leu6-Aib7 -OMe(left handed helix; helix 2)

a) Draw Ramachandran plot and show the location of Aib 4 in both the helices.
b) If you replace Aib4 by Gly what changes do you expect in the structure?
[2+1]

2.A protein solution gives a CD minima at 222 and 208 nm and a maxima at 190 nm. After treating with 8M GdHCl, its CD spectra shows a minima at 205 nm. Explain this phenomena by drawing the appropriate CD spectra. [3]

3.Why protein Vibrational Circular Dichroism is recorded in D_2O? How Trifluoroethanol (CF_3CH_2OH) can act as membrane-mimetic solvent? **[2+2 = 4]**

4. Comment on amide proton splitting pattern of Ala, Gly, N-methylglycine and Aib. **[4]**

5. Draw 1H-NMR spectra of Valine. Comment of splitting pattern of each proton and show proper peak shape.[3]

6. The signal for the CH2 protons of Ph-CH2-OH compound appears in the proton NMR spectrum of benzyl alcohol appears at 4.6 ppm.

Calculate the difference in frequency, expressed in hertz between this and the TMS signal in a 300 MHz and 500 MHz NMR spectrum.

What will be the chemical shift value for CH2 protons of Ph-CH2-OH in a 500 MHz instrument.**[3]**