Task 3

8 December 2020

DISTANCE CALCULATION FROM FRET DATA

The protein human serum albumin (HSA) contains a single tryptophan residue at position 214. HSA was labeled with b ay attaching anthraniloyl to cysteine 34 (Fig.1). Normalized emission spectra of the labeled and unlabeled HSA are shown in Fig. 2. The Förster distance R_0 for FRET pair Trp to anthraniloyl transfer is listed in Table 2 by your name. Use the values from Table 1 derived from emission spectra in Fig. 2 to calculate:
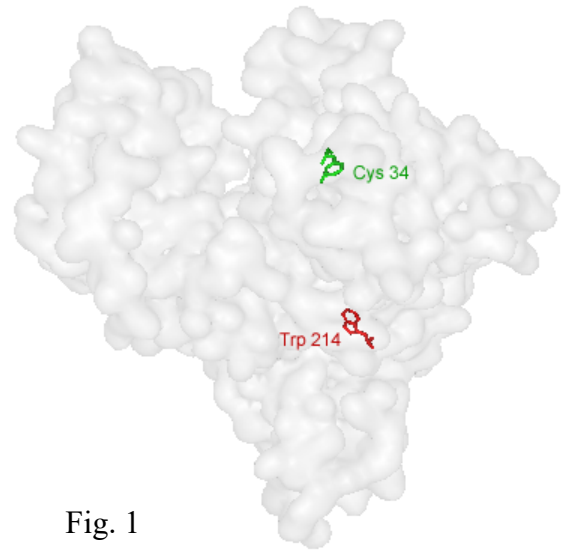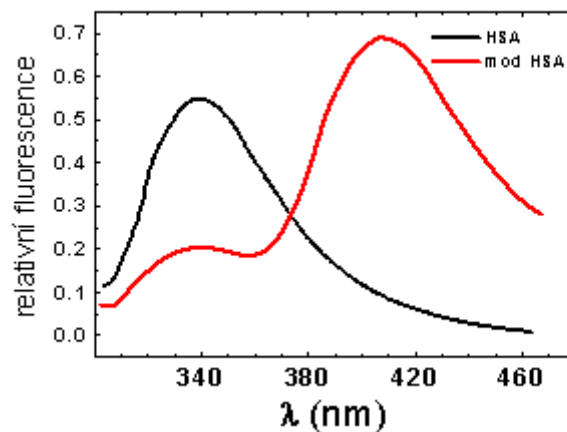

Fig. 1

Fig. 2

Table 1

	relative fluorescence	
	λ (340nm)	λ (408nm)
HSA	0.546	0.091
mod HSA	0.202	0.687

1. **What is the transfer efficiency E between Trp 214 and anthraniloyl E for modified HSA?** Calculate the E value to two decimal places.

2. **What is the distance Trp 214 and anthraniloyl cysteine 34 calculated based on fluorescence resonance energy transfer?**
   Indicate the distance value in Angstroms (Å) with precision to one decimaal place.

   Send me your answer via email. Correct answer = 1 point.

Table 2

		R_{cryst}	R_0
1	Dikunová Alžbeta	31.7	29.0
2	Dzurov Matej	33.2	30.4
3	Faturová Jana	31.7	29.0
4	Gašparik Norbert	33.6	30.7
5	Hesko Ondrej	34.5	31.6
6	Jahodová Kateřina	34.0	31.1
7	Kameniarová Michaela	32.6	29.8
8	Konečná Kateřina	30.2	27.6
9	Korytářová Anna	32.6	29.8
10	Kozeleková Aneta	34.6	31.7
11	Kubinyiová Lenka	33.2	30.4
12	Kůřilová Eliška	35.2	32.2
13	Lysáková Klára	33.7	30.8
14	Mikšátková Barbora	33.3	30.5
15	Nováková Barbora	30.7	28.1
16	Prabhullachandran Unnikannan	35.1	32.1
17	Procházková Markéta	31.1	28.5
18	Šimek Jan	31.8	29.1
19	Tužinčin Dávid	34.1	31.2

This task was prepared base on Problem 1.6 on page 25 in Principles of fluorescence spectroscopy (2006) book of Prof. Lakowicz.