

Homework 5

Bio pharmaceutics & Pharmacokinetics/PHAR434

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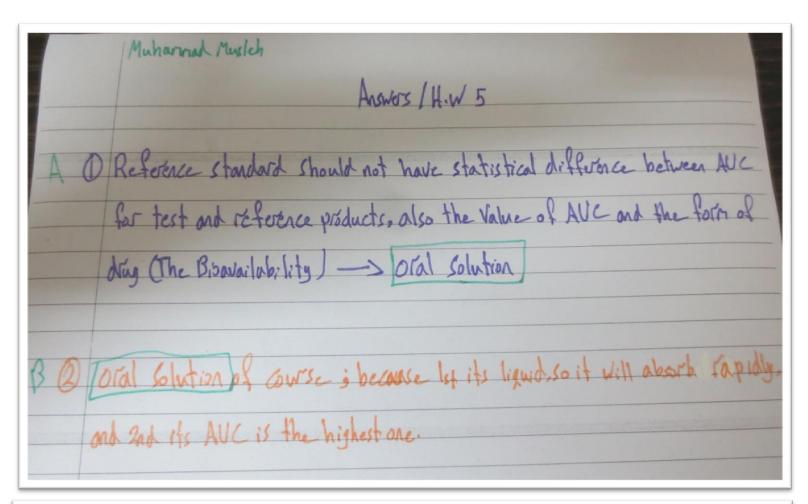
The data in Table 16-22 represent the average findings in antibiotic plasma samples taken from 10 humans (average weight 70 kg), tabulated in a 4-way crossover design.

A.Which of the four drug products in Table 16-22 would be preferred as a reference standard for the determination of relative bioavailability? Why?

- B. From which oral drug product is the drug absorbed more rapidly?
- C. What is the absolute bioavailability of the drug from the oral solution?
- D. What is the relative bioavailability of the drug from the oral tablet compared to the reference standard?
- E. From the data in Table 16-22, determine:
 - (i) Apparent VD
 - (ii) Elimination t1/2
 - (iii) First-order elimination rate constant k
 - (iv) Total body clearance

TABLE 16-22 Comparison of Plasma Concentrations of Antibiotic, as Related to Dosage Form and Time

	Plasma Concentration (μg/mL)			
Time after Dose (h)	IV Solution (2 mg/kg)	Oral Solution (10 mg/kg)	Oral Tablet (10 mg/kg)	Oral Capsule (10 mg/kg)
0.5	5.94	23.4	13.2	18.7
1.0	5.30	26.6	18.0	21.3
1.5	4.72	25.2	19.0	20.1
2.0	4.21	22.8	18.3	18.2
3.0	3.34	18.2	15.4	14.6
4.0	2.66	14.5	12.5	11.6
6.0	1.68	9.14	7.92	7.31
8.0	1.06	5.77	5.00	4.61
10.0	0.67	3.64	3.16	2.91
12.0	0.42	2.30	1.99	1.83
$AUC\left(\frac{\mu g}{mL} \times h\right)$	29.0	145.0	116.0	116.0



CG	(Here also explain why wal solution is the Ref.) Paral * AUCan For Q. D. 10 * 29 10 * 29
D 9	Relative Bioavailability => X. Relative B. A. = Dref * AUCTER * 100 % Ref = oral Solution, Test = oral Tablet. Dtest * AUCRel = 10 × 116 × 100 X => 80 % or 0.8 (Vibbant X) 10 × 145
	First of all, we need to stretch a graph (I.V). From graph I conclude that Cp = 6.48 mg/nL

(iii) Rate constant (k)	$= 0.693 = > 0.643$ $t_{\frac{1}{2}} = > 0.643$
	[k = 0.231 h-1]
(iv) Total body clears	10ce (CIT) = K x Vp => 0.231 h' x 309 ml/kg = 71.379 = 71.4 ml/kg.hr
	CIT = 71.4 ml/kg.hr -> For 1/g, the Simples Clothum ans and average weight - 70/s