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●.

1a. $y = 0{,}077x + 1{,}55$

b. Berapakan waktu paro eliminasi antibiotic

Jam	kadar
2	10
6	5

$$k = \frac{Lnd2 - Lnd1}{t6 - t2}$$

$$= \frac{1{,}609 - 2{,}302}{6-2}$$

$$= \frac{1{,}609 - 2{,}302}{4}$$

$$= -\frac{0{,}693}{4}$$

$$= -0{,}173$$

$$T\ 1/2 = \frac{0{,}693}{0{,}173} = 4{,}005$$

●

c. Berapakah kadar obat dalam plasma t=0

Jawab:

DIV = 2mg
t1 = 2jam
C1 = 10ml
t2 = 6jam
C2 = 5ml

$Lnct = Lnco - k.t$

$Ln10 = Lnco - 0{,}173 \cdot 2$

$2.302 = Lnco - 0{,}346$

$Lnco = 1{,}956$

1D. Hitunglah parameter lain yang diperlukan untuk menerangkan farmakokinetik antibiotik

Jawab :

a. Slope = $\frac{-k}{2{,}303}$

$0{,}077 = \frac{-k}{2{,}303}$

$k = 0{,}077 \times 2{,}303$

$= 0{,}177$ jam

b. Intercept y = log Co

$1{,}155 = \log Co$

$Co = 14{,}18$ ug/ml

$Vd = \frac{DIV}{Co} = \frac{5000}{14{,}18} = 3{,}155{,}11$ ml

$AUC = \frac{Co}{k} = \frac{14{,}18}{0{,}177} = 795{,}48$ ug/jam

$Cl = \frac{DIV}{AUC} = \frac{5000}{795{,}48} = 6{,}285$ ml / jam

$T1/2 = \frac{0{,}693}{0{,}177} = 3{,}915 = 4$ jam

2.a. persamaan

$$y = -0{,}074\,x + 0{,}933$$

2 b. hitunglah semua parameter yang diperlukan

a. Slope $= \frac{-k}{2{,}303}$

$0{,}074x = \frac{-k}{2{,}303}$

$= 0{,}074 \times 2{,}303$

$= 0{,}170$ jam

b. intercept $y = \log Co$

$0{,}933 = \log Co$

$Co = 140{,}8$ ug/ml

$Vd = \frac{DIV}{Co} = \frac{5000}{140{,}8} = 35{,}11$ ml

$AUC = \frac{Co}{K} = \frac{140{,}8}{0{,}170} = 828{,}23$ ug/ml

$Cl = \frac{DIV}{AUC} = \frac{5000}{828{,}23} = 6{,}036$ ml/jam

$T1/2 = \frac{0{,}693}{0{,}170} = 4{,}076 = 4$ jam

c. Jika nilai ambang efek 1,5 ug/ml. berapa durasi efek obat

jawab:

$Cp = 1{,}5$ ug/ml $\quad t = ?$

$\log cp = \frac{-kt}{2.303} * + \log cp^{o}$

$\log 1{,}5 = \frac{0{,}1702}{2.303} + 8.5743$

$0{,}1760 = \frac{0{,}1702}{2.303} + 0{,}9331$

$\frac{0{,}1702}{2{,}303} = 0{,}9331 - 0{,}1760$

$2{,}303 = 0{,}17571$

$t = \frac{0{,}17571 \times 2{,}303}{0{,}1702}$

$= \frac{1{,}7436}{0{,}1702}$

$= 10{,}24$

$= 10$ jam

D. Berapa lama waktu yang diperluran untuk mengeliminasi 99,2% obat

Jawab:

$$Cp^0 = \frac{0,8}{100} \times 8.5743 = 0,06859144$$

$$\log Cp = \frac{-kt}{2,303} + \log Cp$$

$$0,06859144 = \frac{0,1702 \times t}{2,303} \times 6.85944$$

$$1,1637 = \frac{0,1702 \times t}{2,303} * 0,8362$$

$$\frac{0,1702}{2,303} = 0,8362 + 1,1637$$

$$t = \frac{2 \times 2.303}{1,1702}$$

$$= 2,706 \text{ jam}$$

e. Dosis dinaikan 2x

$$\text{dosis } 2X = 2 \times Cp^0$$
$$= 2 \times 6,85944$$
$$= 13.71888 \text{ mg}$$

$$\log Cp = \frac{-kt}{2.303} \times \log Cp^0$$

$$\log 2 = \frac{0,1702 \times t}{2.303} \cdot 13718$$

$$0,3010 = \frac{0,1702 \times t}{2.303} \times 13.7188$$

$$t = \frac{13.4178}{0,1702} \times 2.303$$

$$= 181,155 \text{ jam}$$