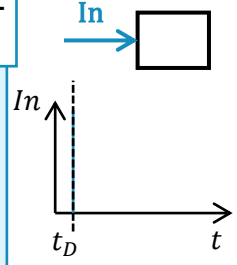
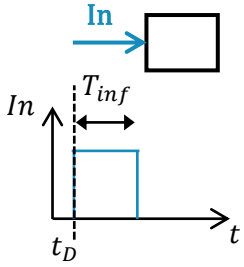
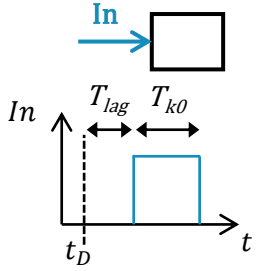
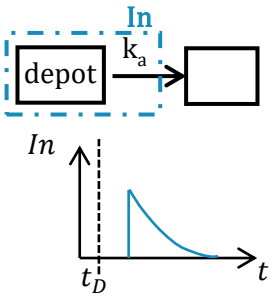
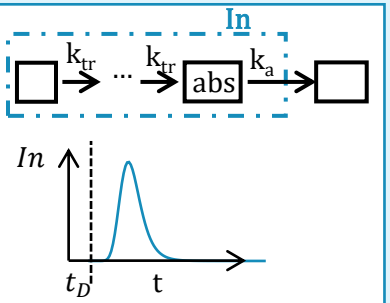
LIXOFT

Administration	Distribution	Elimination

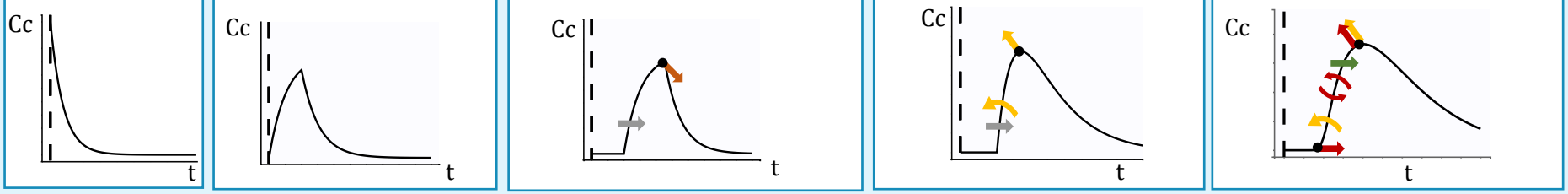
In = Input rate → Compartments (ODE system) → El = Elimination rate

Administration

In → [ ] → El

	bolus	infusion	oral/extravascular		
			0-order absorption	1st-order absorption	1st-order absorption
			+/- lag time	+/- lag time	transit compartments
Input rate					
	$In = \delta_{tD} D$	$In(t) = \frac{D}{T_{inf}} \mathbf{1}_{[t_D, t_D+T_{inf}]}$	$In = \frac{D}{T_{k0}} \mathbf{1}_{[t_D+T_{lag}, t_D+T_{inf}+T_{lag}]}$	$\forall t > t_D - T_{lag}$, $In = D k_a e^{-k_a(t-t_D-T_{lag})}$	$A_n = D \frac{(k_{tr}t)^n e^{-k_{tr}t}}{n!}$, $\frac{dA_a}{dt} = k_{tr}A_n - k_a A_a$, $In = k_a A_a$
Parameters			T_{k0} T_{lag} (optional)	k_a T_{lag} (optional)	Mtt k_{tr} k_a

Output Cc for 1 compartment with linear elimination — translates point — translates curve — rotates curve



LIXOFT

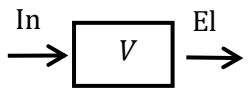
Administration | **Distribution** | **Elimination**

In = Input rate → Compartments (ODE system) → El = Elimination rate

Distribution

In → [ ] → El

1 compartment



ODE system

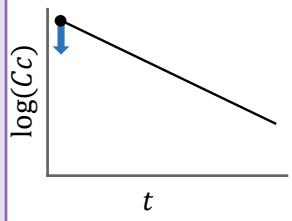
$$\frac{dA_c}{dt} = In - El$$

Parameters

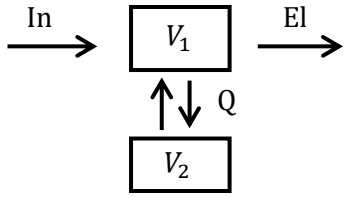
$Cc = \frac{A_C}{V}$

V

Output log(Cc)for 1 bolus with linear elimination



2 compartments



ODE system

$$\frac{dA_c}{dt} = In - El + k_{21}A_2 - k_{12}A_C$$

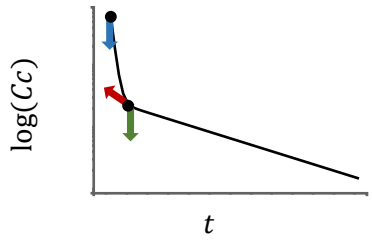
$$\frac{dA_2}{dt} = -k_{21}A_2 + k_{12}A_C$$

Parameters

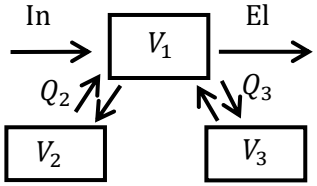
$k_{21} = \frac{Q}{V_2}$ $k_{12} = \frac{Q}{V_1}$ $Cc = \frac{A_C}{V_1}$

V_1 V_2 Q

Output log(Cc)for 1 bolus with linear elimination



3 compartments



ODE system

$$\frac{dA_c}{dt} = In - El + k_{21}A_2 - k_{12}A_C + k_{31}A_3 - k_{13}A_C$$

$$\frac{dA_2}{dt} = -k_{21}A_2 + k_{12}A_C$$

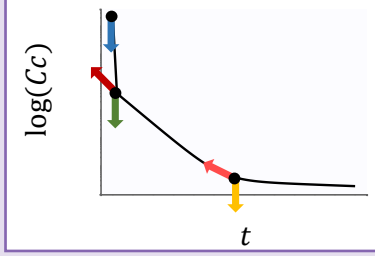
$$\frac{dA_3}{dt} = -k_{31}A_3 + k_{13}A_C$$

Parameters

$k_{n1} = \frac{Q_n}{V_n}$ $k_{1n} = \frac{Q_n}{V_1}$ $Cc = \frac{A_C}{V_1}$

V_1 V_2 V_3 Q_2 Q_3

Output log(Cc)for 1 bolus with linear elimination

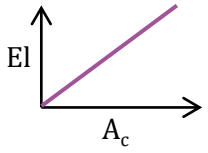


Elimination

In → [ ] → El

linear

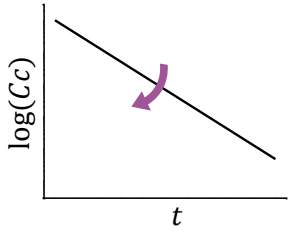
Elimination rate



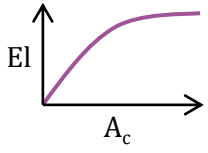
$El = \frac{C_l}{V} A_C$

C_l

Output log(Cc) for 1 bolus with 1 cpt



Michaelis-Menten



$El = \frac{V_m A_C}{K_m V + A_C}$

K_m V_m

Output log(Cc) for 1 bolus with 1 cpt