

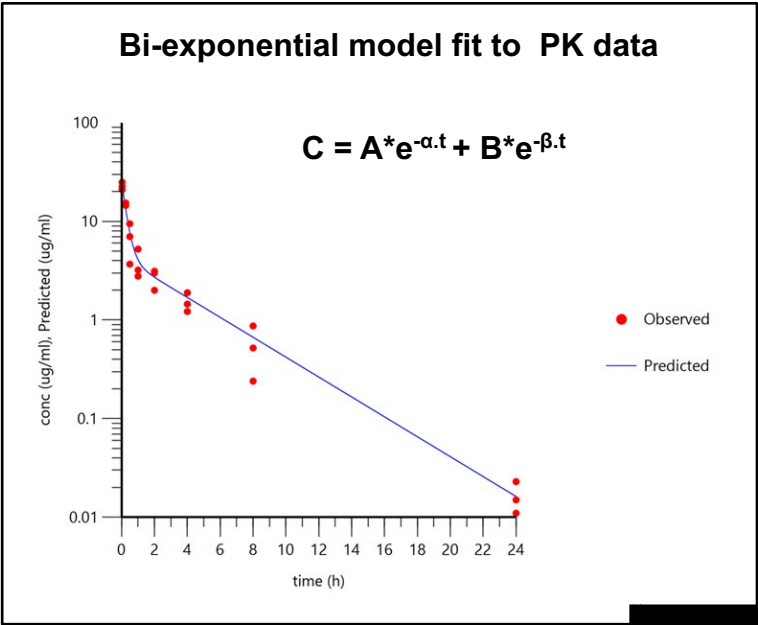
Intravenous Infusion Dosing Regimens: Varying Concentrations at Constant Exposure

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Are the AUCs the same when the same dose is administered as intravenous infusions for different durations? A two compartment model was fit to PK data of ciprofloxacin, and the model was used to simulate constant rate infusions of varying durations for a dose of 30 mg/kg in rats.

Plasma conc-time data of ciprofloxacin in rats: IVPK, 30 mg/kg, bolus

time [h]	concentration [µg/ml]		
	1	2	3
0.033	22.560	24.900	20.940
0.25	14.500	15.330	15.000
0.5	3.680	7.000	9.450
1	2.780	3.210	5.230
2	2.000	3.120	2.990
4	1.450	1.220	1.890
8	0.240	0.520	0.870
24	0.015	0.023	0.011

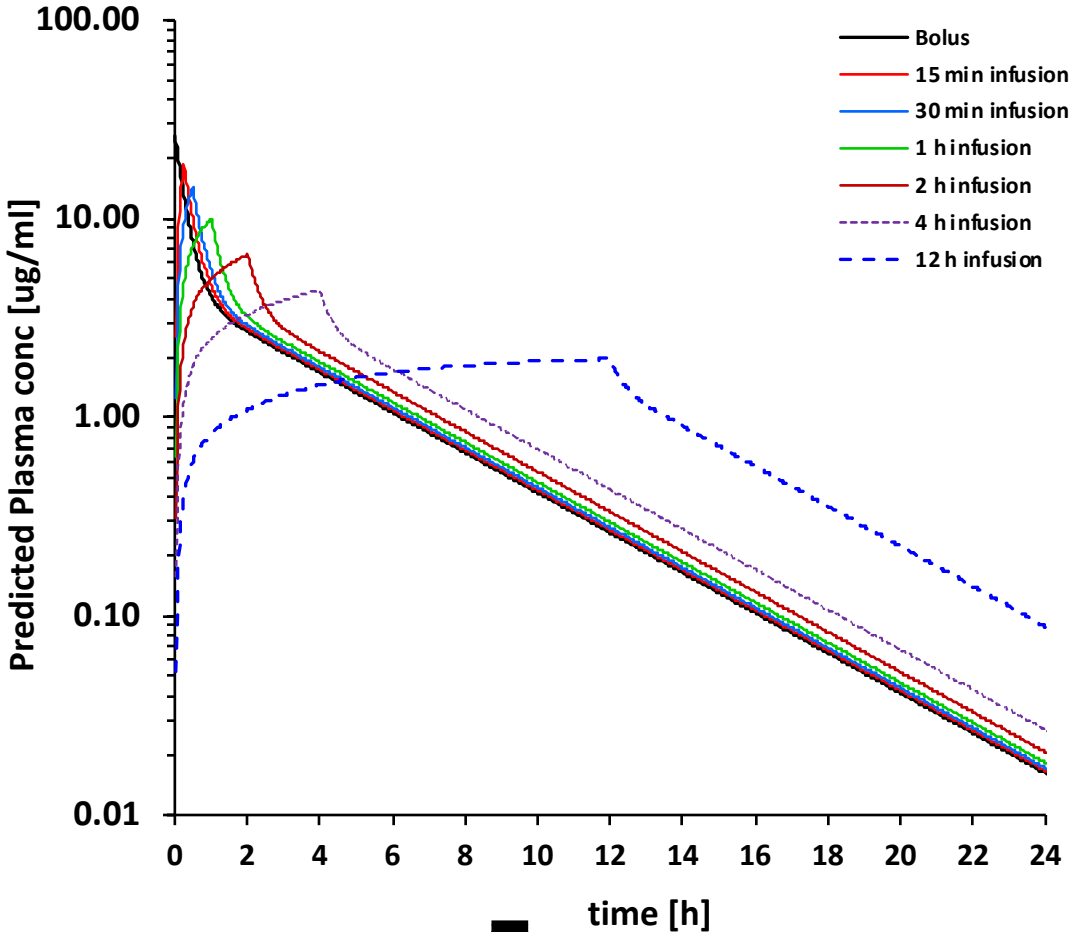


Model Parameter estimates

Parameter	Estimate
AUC [µg.h/ml]	24.8
α $t_{1/2}$ [h]	0.201
β $t_{1/2}$ [h]	2.984
C_{max} [µg/ml]	26.23
V1 [ml/kg]	1144
CL [ml/h/kg]	1210
V2 [ml/kg]	2818
CLD2 [ml/h/kg]	2136

Simulations
with
PK
Model

Simulated PK curves for different infusion regimens of ciprofloxacin in rats @30 mg/kg



The AUC of Ciprofloxacin was predicted to be the same as bolus for all the infusion regimens, while C_{max} decreased with increasing infusion time.

Model predicted AUC and Cmax of Ciprofloxacin in rats at 30 mg/kg infused for different durations

Parameter	15 min inf	30 min inf	1 h inf	2 h inf	4 h inf	12 h inf
AUC [µg.h/ml]	24.8	24.8	24.8	24.8	24.8	24.8
C_{max} [µg/ml]	18.86	14.50	9.98	6.60	4.38	1.97