

## Online Supplemental Material

Pharsight Model Language (PML) code for the final model.

```
urinecpt(A1s = (Cls * Cs))
urinecpt(A1r = (Clr * Cr))
deriv(A1s = (Ex_CO * CmixS)- (Exp_CL2 * (Cs - C2s))- (Cls * Cs)- (Exp_CL3 * (Cs - C3s)))
deriv(AmixS = - (Ex_CO * CmixS))
deriv(AmixR = - (Ex_CO * CmixR))
deriv(A1r = (Ex_CO * CmixR)- (Exp_CL2 * (Cr - C2r))- (Clr * Cr)- (Exp_CL3 * (Cr - C2)))
deriv(A2s = (Exp_CL2 * (Cs - C2s)))
deriv(A2r = (Exp_CL2 * (Cr - C2r)))
deriv(A3r = (Exp_CL3 * (Cr - C2)))
deriv(A3s = (Exp_CL3 * (Cs - C3s)))
Ex_ket_s_a = Cs+CmixS
Ex_ket_s_v = Cs*(1-f)+((f*Carms*V2b)/Vcb*Clr)/Cls
Ex_CO = Clt
Ex_Vmix = Vmix
Exp_ket_r_a = Cr+CmixR
Exp_ket_r_v = Cr*(1-f)+((f*Carmr*V2b)/Vcb
Exp_V2 = V2b
Exp_CL2 = Cl2b
Expr2 = Vcb
Exp_Vcs = Vcb*Cls/Clr
Karm0_correct = Karm0*Cls/Clr
Karm0 = Karm0
Exp_CL3 = Cl3b
Exp_V3 = V3b
Cs = A1s / Exp_Vcs
error(CEps = 0.256127)
observe(CObs_s_a = Ex_ket_s_a * (1 + CEps))
CmixS = AmixS / Ex_Vmix
dosepoint(AmixS, idosevar = AmixSDose, infdosevar = AmixSInfDose, infratevar = AmixSInfRate)
error(CEps = 0.255671)
observe(CObs_s_v = Ex_ket_s_v * (1 + CEps))
CmixR = AmixR / Ex_Vmix
dosepoint(AmixR, idosevar = AmixRDose, infdosevar = AmixRInfDose, infratevar = AmixRInfRate)
Cr = A1r / Expr2
error(CEps = 0.234489)
observe(CObs_r_a = Exp_ket_r_a * (1 + CEps))
error(CEps = 0.236943)
observe(CObs_r_v = Ex_ket_r_v * (1 + CEps))
C2s = A2s / Exp_V2
C2r = A2r / Exp_V2
deriv(Carmr = karm0 * (Cr - Carmr))
deriv(Carms = Karm0_correct * (Cs - Carms))
C2 = A3r / Exp_V3
```

```

C3s = A3s / Exp_V3
stparm(CIT = tvCIT * exp(nCIT))
stparm(Vcb = tvVcb * exp(nVcb))
stparm(V2b = tvV2b * exp(nV2b))
stparm(CI2b = tvCI2b)
stparm(Vmix = tvVmix)
stparm(f = tvf)
stparm(CIs = tvCIs * exp(nCIs))
stparm(CIc = tvCIc * exp(nCIc))
stparm(Karm0 = tvKarm0)
stparm(CI3b = tvCI3b)
stparm(V3b = tvV3b * exp(nV3b))
fixef(tvCIT = c(, 8.32721, ))
fixef(tvVcb = c(0, 38.7646, ))
fixef(tvV2b = c(0, 101.541, ))
fixef(tvCI2b = c(0, 2.54786, ))
fixef(tvVmix(freeze) = c(, 1, ))
fixef(tvf = c(0, 0.0549966, ))
fixef(tvCIs = c(0, 1.44919, ))
fixef(tvCIc = c(0, 1.24568, ))
fixef(tvKarm0 = c(, 0.113223, ))
fixef(tvCI3b = c(, 1.12675, ))
fixef(tvV3b = c(, 98.5114, ))
ranef(diag(nV2b, nCIs, nCIT, nVcb, nV3b, nCIc) = c(0.046154642, 3.1495102E-08, 0.053986428,
0.053689047, 7.57531E-06, 0.00098618872))

```