**Applied Monolix source code for Eqs. (15)-(23)**

DESCRIPTION:

BsAb QE approximation with constant total receptors

[LONGITUDINAL]

input = {kel,KD1,KD2,a,RA0,RB0,kint,V}

PK:

tdur = 0.0001

depot(adm = 1,target = In,p = 1/tdur)

depot(adm = 1,target = In,p = -1/tdur, Tlag = tdur)

EQUATION:

odeType=stiff

t\_0=0

C\_0 = 0

RA\_0 = RA0

RB\_0 = RB0

In\_0 = 0

kdegA = kint

kdegB = kint

kintA = kint

kintB = kint

kintAB = kint

ksynA = RA0\*kdegA

ksynB = RB0\*kdegB

gam = a\*KD1\*KD2

det = ( C\*KD2\*RA^2 + C^2\*KD2\*RA + C\*KD1\*RB^2 + C^2\*KD1\*RB + C^2\*RA\*RB + a\*KD1^2\*KD2^2 + C\*KD1\*KD2\*RA + C\*KD1\*KD2\*RB

+ KD1\*KD2\*RA\*RB + a\*C\*KD1\*KD2^2 + a\*C\*KD1^2\*KD2 + a\*C^2\*KD1\*KD2 + a\*KD1\*KD2^2\*RA + a\*KD1^2\*KD2\*RB + a\*C\*KD1\*KD2\*RA + a\*C\*KD1\*KD2\*RB )/ (a\*KD1^2\*KD2^2);

m11 = (C^2\*KD2\*RA + C^2\*KD1\*RB + a\*KD1^2\*KD2^2 + C\*KD1\*KD2\*RA + C\*KD1\*KD2\*RB + a\*C\*KD1\*KD2^2 + a\*C\*KD1^2\*KD2 + a\*C^2\*KD1\*KD2 ) / (a\*KD1^2\*KD2^2);

m12 = - (C^2\*RA + C\*KD1\*RB + a\*C^2\*KD1 + a\*C\*KD1\*KD2)/(a\*KD1^2\*KD2);

m13 = - (C^2\*RB + C\*KD2\*RA + a\*C^2\*KD2 + a\*C\*KD1\*KD2)/(a\*KD1\*KD2^2);

m21 = - (C\*RA^2 + KD1\*RA\*RB + a\*C\*KD1\*RA + a\*KD1\*KD2\*RA)/(a\*KD1^2\*KD2);

m22 = (C\*RA^2 + C\*KD1\*RA + KD1\*RA\*RB + a\*C\*KD1^2 + a\*KD1^2\*KD2 + a\*KD1^2\*RB + a\*C\*KD1\*RA + a\*KD1\*KD2\*RA)/(a\*KD1^2\*KD2);

m23 = - (C\*RA-a\*C\*RA)/(a\*KD1\*KD2);

m31 = -(C\*RB^2 + KD2\*RA\*RB + a\*C\*KD2\*RB + a\*KD1\*KD2\*RB)/(a\*KD1\*KD2^2);

m32 = -(C\*RB - a\*C\*RB)/(a\*KD1\*KD2);

m33 = (C\*RB^2 + C\*KD2\*RB + KD2\*RA\*RB + a\*C\*KD2^2 + a\*KD1\*KD2^2 + a\*KD2^2\*RA + a\*C\*KD2\*RB + a\*KD1\*KD2\*RB)/(a\*KD1\*KD2^2);

g1 = In/V - kel\*C - kintA\*(RA\*C)/KD1 - kintB\*(RB\*C)/KD2 - kintAB\*(RA\*RB\*C)/gam

g2 = ksynA - kdegA\*RA - kintA\*(RA\*C)/KD1 - kintAB\*(RA\*RB\*C)/gam

g3 = ksynB - kdegB\*RB - kintB\*(RB\*C)/KD2 - kintAB\*(RA\*RB\*C)/gam

ddt\_C = (m11/det)\*g1 + (m12/det)\*g2 + (m13/det)\*g3

ddt\_RA = (m21/det)\*g1 + (m22/det)\*g2 + (m23/det)\*g3

ddt\_RB = (m31/det)\*g1 + (m32/det)\*g2 + (m33/det)\*g3

ddt\_In = 0

OUTPUT:

output = {C,RA,RB}