1 Section S2 : Model Equations

Supporting information file S2 for:
A computational model of postprandial adipose tissue lipid metabolism derived using human arterio-venous stable isotope tracer data.

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Triglyceride flux

$$TG_{flux} = -K_{ad}[TG_{art}][I_{LPL}] \tag{1}$$

Fractional spill-over

$$\%\text{ spill-over} = \frac{1}{100}(D_{spill}\frac{I_B}{[I_{art}]}) \tag{2}$$

Glucose flux

$$G_{flux} = -GLUT1[G_{art}] - GLUT4[G_{art}][I_{AT}] \tag{3}$$

Production of adipose G-3-P

$$\frac{d[\text{G-6-P}]}{dt} = \frac{1}{\tau_{\text{G-3-P}}}(2frac_{use}(GLUT1[G_{art}] + GLUT4[G_{art}][I_{AT}]) - [\text{G-6-P}]) \tag{4}$$

$$\frac{d[\text{G-3-P}_{pro}]}{dt} = \frac{1}{\tau_{\text{G-3-P}}}([\text{G-6-P}] - [\text{G-3-P}_{pro}]) \tag{5}$$

$$\frac{d[\text{G-3-P}_{AT}]}{dt} = [\text{G-3-P}_{pro}] - K_{reest}[I_{AT}][NEFA_{AT}][\text{G-3-P}_{AT}] \tag{6}$$

Glycerol flux

$$GLY_{flux} = K_{ad}[TG_{art}][I_{LPL}] + p_{GLY}([GLY_{AT}] - ([GLY_{art}] + K_{ad}[TG_{art}][I_{LPL}])) \tag{7}$$

$$\frac{d[GLY_{AT}]}{dt} = -p_{GLY}([GLY_{AT}] - [GLY_{art}] + K_{ad}[TG_{art}][I_{LPL}]) + B_{ATL} + \frac{ATL_{max}}{1 + \frac{[I_{AT}]}{K_{ATL}}} \tag{8}$$

NEFA flux

$$\begin{aligned} NEFA_{flux} = {} & \frac{3}{100}(D_{spill}\frac{I_B}{[I_{art}]})K_{ad}[TG_{art}][I_{LPL}] \\ & - p_{NEFA}(([NEFA_{art}] + \frac{3}{100}(D_{spill}\frac{I_B}{[I_{art}]})K_{ad}[TG_{art}][I_{LPL}]) - [NEFA_{AT}]) \end{aligned} \tag{9}$$

$$\begin{aligned} \frac{d[NEFA_{AT}]}{dt} = {} & \frac{3}{100}(1 - D_{spill}\frac{I_B}{[I_{art}]})K_{ad}[TG_{art}][I_{LPL}] \\ & + p_{NEFA}(([NEFA_{art}] + \frac{3}{100}(D_{spill}\frac{I_B}{[I_{art}]})K_{ad}[TG_{art}][I_{LPL}]) - [NEFA_{AT}]) \\ & + 3(B_{ATL} + \frac{ATL_{max}}{1 + \frac{[I_{AT}]}{K_{ATL}}}) - 3(K_{reester}[I_{AT}][NEFA_{AT}][\text{G-3-P}_{AT}]) \end{aligned} \tag{10}$$

LPL insulin signal

$$\frac{d[I_1]}{dt} = \frac{1}{\tau_{LPL}}([I_{art}] - [I_1]) \tag{11}$$

$$\frac{d[I_2]}{dt} = \frac{1}{\tau_{LPL}}([I_1] - [I_2]) \tag{12}$$

$$\frac{d[I_{LPL}]}{dt} = \frac{1}{\tau_{LPL}}([I_2] - [I_{LPL}]) \tag{13}$$

Adipose tissue insulin signal

$$\frac{d[I_1]}{dt} = \frac{1}{\tau_{AT}}([I_{art}] - [I_1]) \tag{14}$$

$$\frac{d[I_2]}{dt} = \frac{1}{\tau_{AT}}([I_1] - [I_2]) \tag{15}$$

$$\frac{d[I_{AT}]}{dt} = \frac{1}{\tau_{AT}}([I_2] - [I_{AT}]) \tag{16}$$