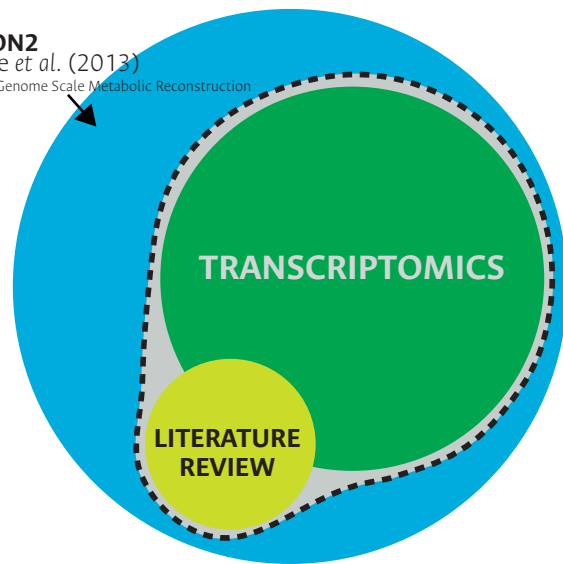


**RECON2**  
Thiele et al. (2013)  
Human Genome Scale Metabolic Reconstruction



## METABOLIC RECONSTRUCTION

$A + B \leftrightarrow C$     **Reaction 0001**  
 $B + 2C \rightarrow D$     **Reaction 0002**  
 ...  
 $D + B \rightarrow A$     **Reaction n**

## MATHEMATICAL REPRESENTATION

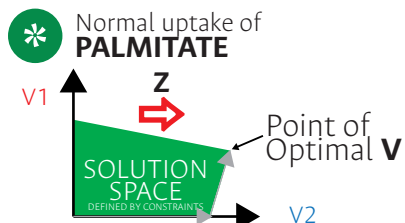
	R1	R2	...	n	Astrocyte Functions	DMEM Culture Medium	Palmitate
A	-1			1			
B	-1	-1		-1			
C	1	-2					
D		1		-1			
...							
m							

STOICHIOMETRIC MATRIX, **S**

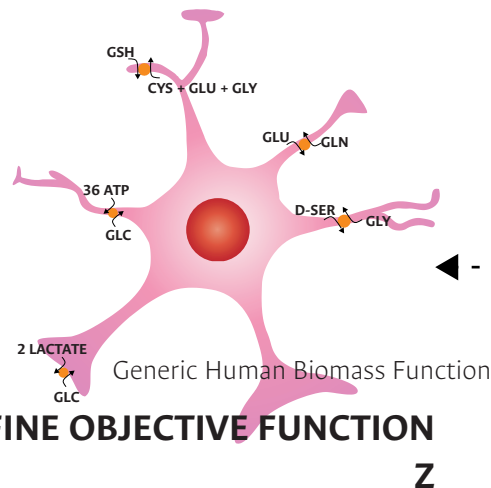
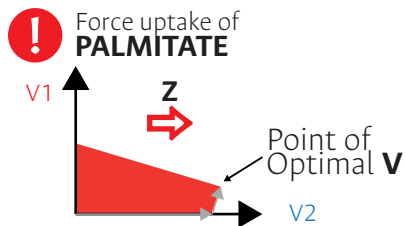
**METABOLIC SCENARIOS**

FLUXES, **v**

$$\begin{matrix}
 v_1 \\
 v_2 \\
 \vdots \\
 v_{DMEM1} \\
 \vdots \\
 v_{DMEMn} \\
 v_{gt1} \\
 v_{gt2}
 \end{matrix}
 = 0$$



**CALCULATE FLUXES THAT MAXIMIZE**



**MASS BALANCE DEFINE A SYSTEM OF LINEAL EQUATIONS**

$$\begin{aligned}
 -V1 + \dots &= 0 \\
 V1 - V2 + \dots &= 0 \\
 V1 - 2V2 + \dots &= 0 \\
 V2 + \dots &= 0 \\
 \text{etc.}
 \end{aligned}$$