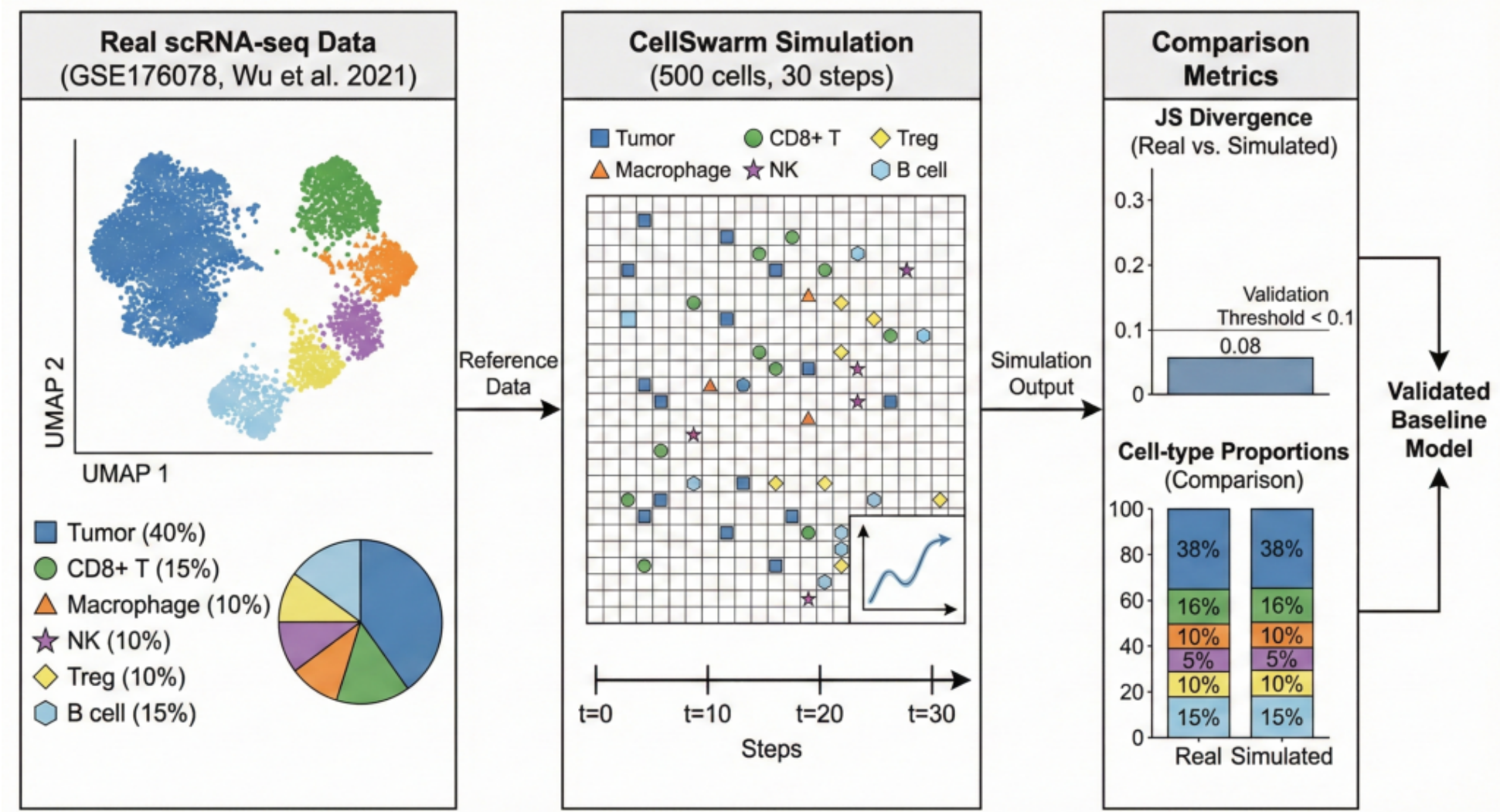
A


Real scRNA-seq Data
(GSE176078, Wu et al. 2021)
UMAP 2
UMAP 1
Tumor (40%)
CD8+ T (15%)
Macrophage (10%)
NK (10%)
Treg (10%)
B cell (15%)
Reference Data
CellSwarm Simulation
(500 cells, 30 steps)
Tumor
CD8+ T
Treg
Macrophage
NK
B cell
t=0
t=10
t=20
t=30
Steps
Simulation Output
Comparison Metrics
JS Divergence
(Real vs. Simulated)
0.3
0.2
0.1
0
Validation Threshold < 0.1
0.08
Cell-type Proportions
(Comparison)
100
80
60
40
20
0
38%
38%
16%
16%
10%
10%
5%
5%
10%
10%
15%
15%
Real
Simulated
Validated Baseline Model