a) Method Characteristics							b) Evaluation Summary				
						The application scenarios	Scores of overall performace and four criteria				
	Platform	Prior Information	Groups	DEGs	Batches	Trajectory	Overall	Accuracy	Functionality	Scalability	Usability
Class 1 Method											
SPARSim	R	group labels (optional) ERCC spike-in (optional)	✓	✓	✓						
SCRIP-BP	R		✓	✓	✓						
Splat	R		✓	✓	✓						
SCRIP-GP-trendedBCV	R		✓	✓	✓						
SCRIP-GP-commonBCV	R		✓	✓	✓						
SCRIP-BGP-trendedBCV	R		✓	✓	✓						
SCRIP-BGP-commonBCV	R		✓	✓	✓						
powsimR	R	ERCC spike-in (optional)	✓	✓	✓						
SplatPop	R		✓	✓	✓						
SPsimSeq	R	group labels (optional) batch labels (optional)	✓	✓	✓						
Class 2 Method											
PROSSTT	Python	group labels (optional)				✓					
SCRIP-paths	R		✓	✓	✓	✓					
Splat-paths	R		✓	✓	✓	✓					
ESCO-tree	R	group labels (optional)	✓	✓		✓					
SplatPop-paths	R		✓	✓	✓	✓					
ESCO-traj	R	group labels (optional)	✓	✓		✓					
TedSim	R	group labels (optional)	✓			✓					
phenopath	R					✓					
MFA	R					✓					
SymSim	R	group labels (optional)	✓			✓					
dyngen	R	group labels (optional)				✓					
VeloSim	R	group labels (optional)	✓			✓					
dyntoy	R	group labels (optional)				✓					
Class 3 Method											
Lun	R		✓	✓							
scDesign	R		✓	✓							
Lun2	R	group labels	✓	✓							
muscat	R	group labels (optional)	✓	✓							
ESCO	R	group labels (optional)	✓	✓							
scDD	R	group labels	✓	✓							
scDesign3	R	group labels (optional) batch labels (optional)	✓		✓						
zingeR	R	group labels	✓	✓							
zinbwaveZinger	R	group labels	✓	✓							
Class 4 Method											
scDesign2	R	group labels (optional)	✓								
hierarchicell	R		✓								
scGAN	Python	group labels (optional)	✓								
POWSC	R		✓								
SparseDC	R	group labels	✓								
SimBPDD	R	group labels	✓								
BASiCS	R	batch labels ERCC spike-in			✓						
Class 5 Method											
Simple	R										
Kersplat	R										
zinbwave	R										
BEARscc	R	ERCC spike-in									
dropsim	R										
CancerInSilico	R										