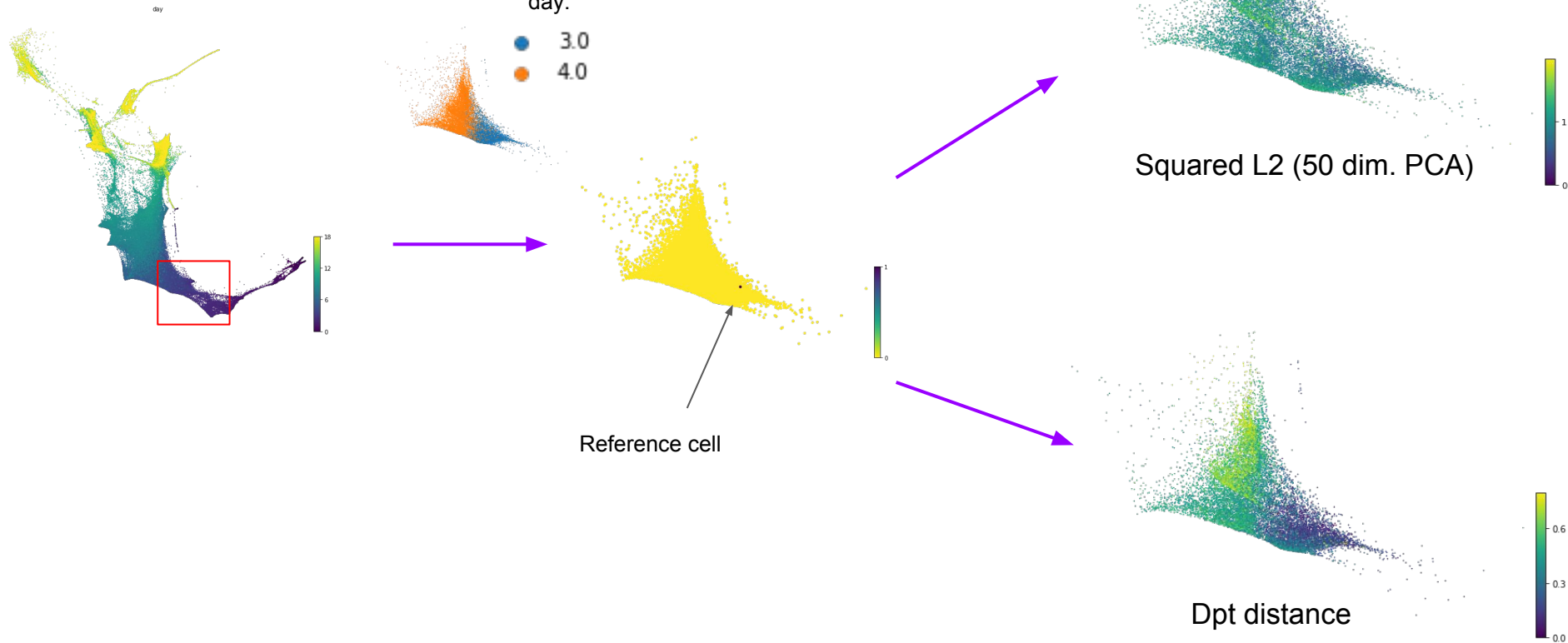


Using dpt-distance as transportation cost

DPT distance vs. euclidean distance

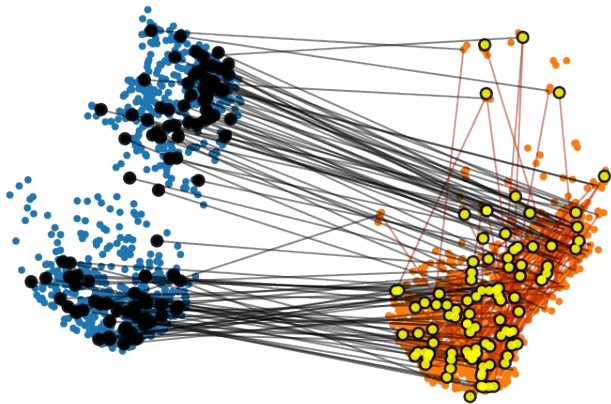


Benchmark

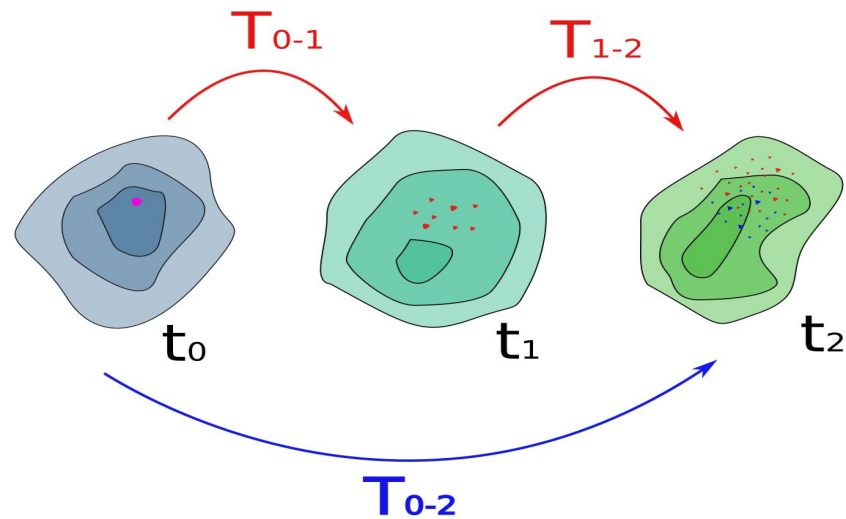
Transportation costs	Squared L2 (=WOT)+ dpt-distance
Representations	PCA + global scVI + local scVI
Data sets	WOT-data set + Mouse Gastrulation
Validation metrics	Geodesic interpolation + Push-consistency

Validation of transport maps

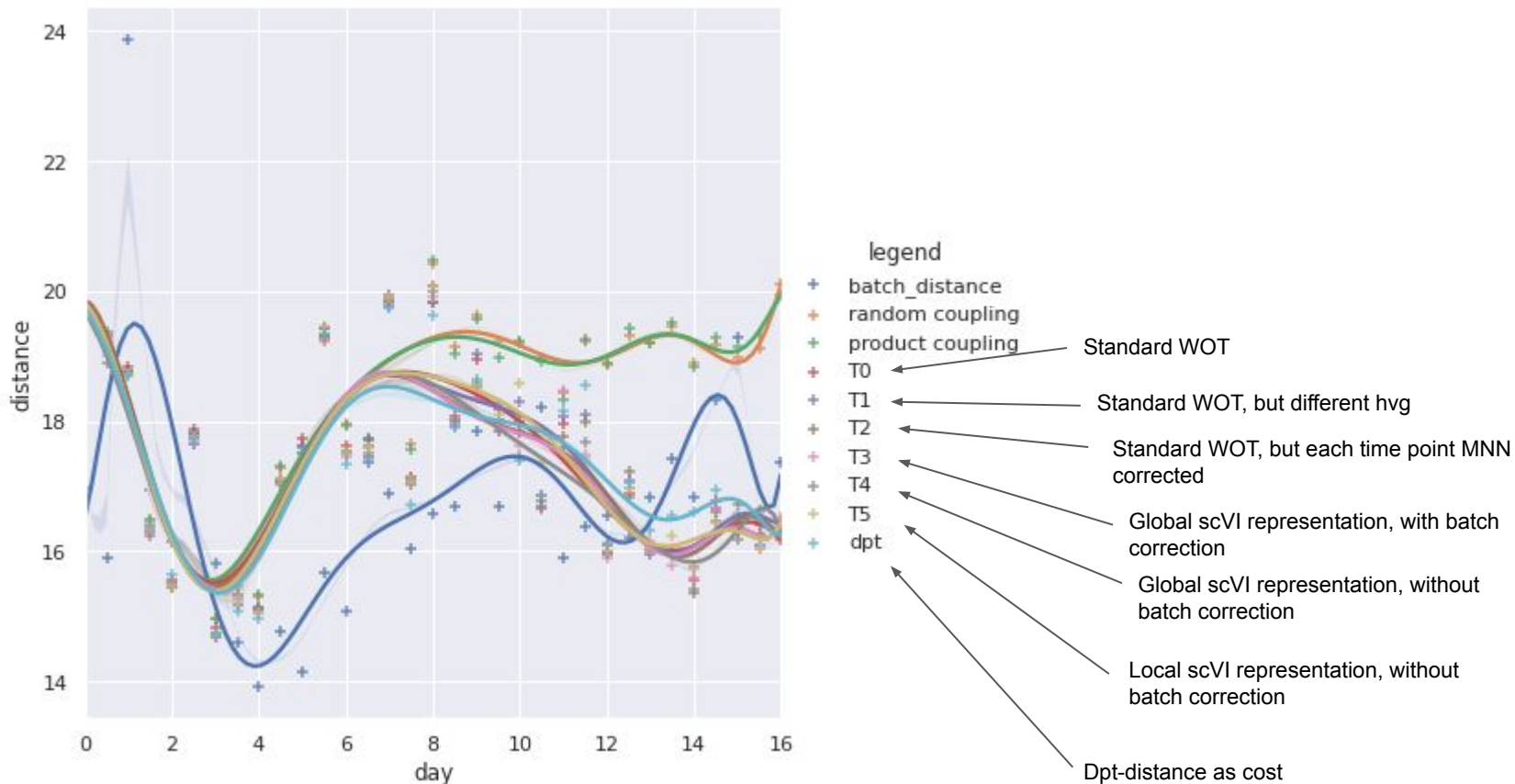
Geodesic interpolation



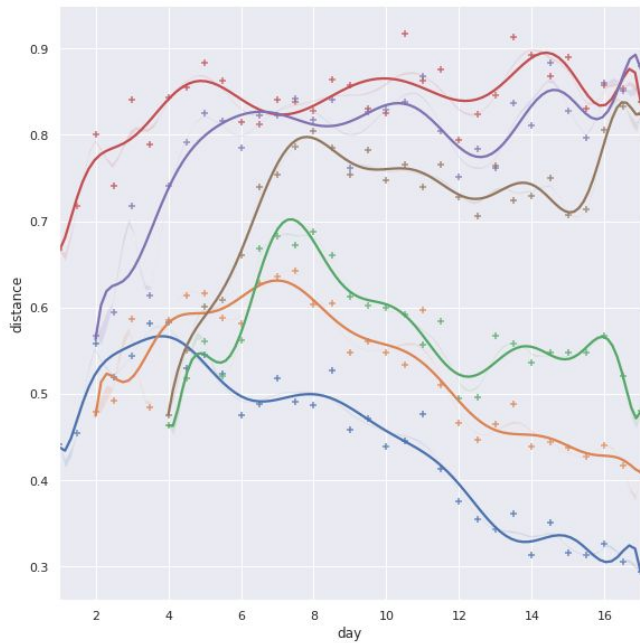
Push-consistency



Why I don't like using geodesics



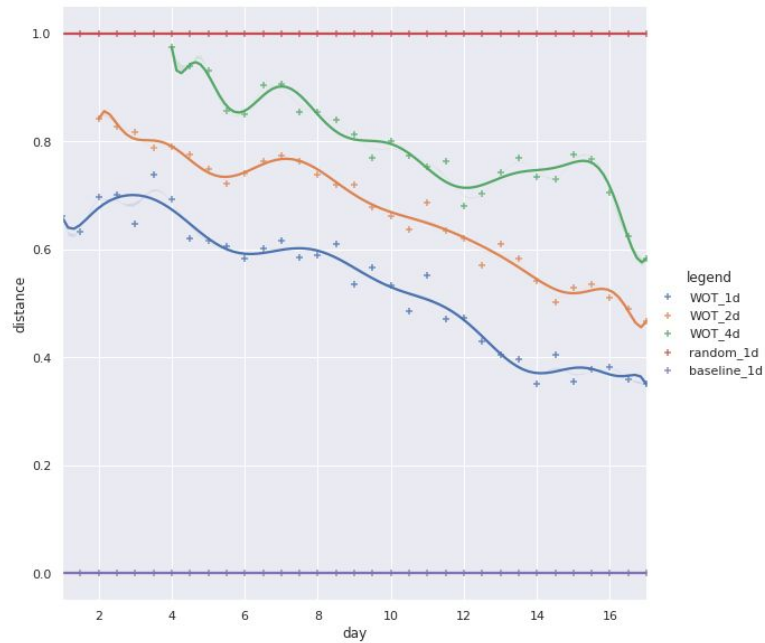
Push-consistency



WOT_1d=
2x 0.5d compared to 1x 1d

legend
+ WOT_1d
+ WOT_2d
+ WOT_4d
+ WOT_random_1d
+ WOT_random_2d
+ WOT_random_4d

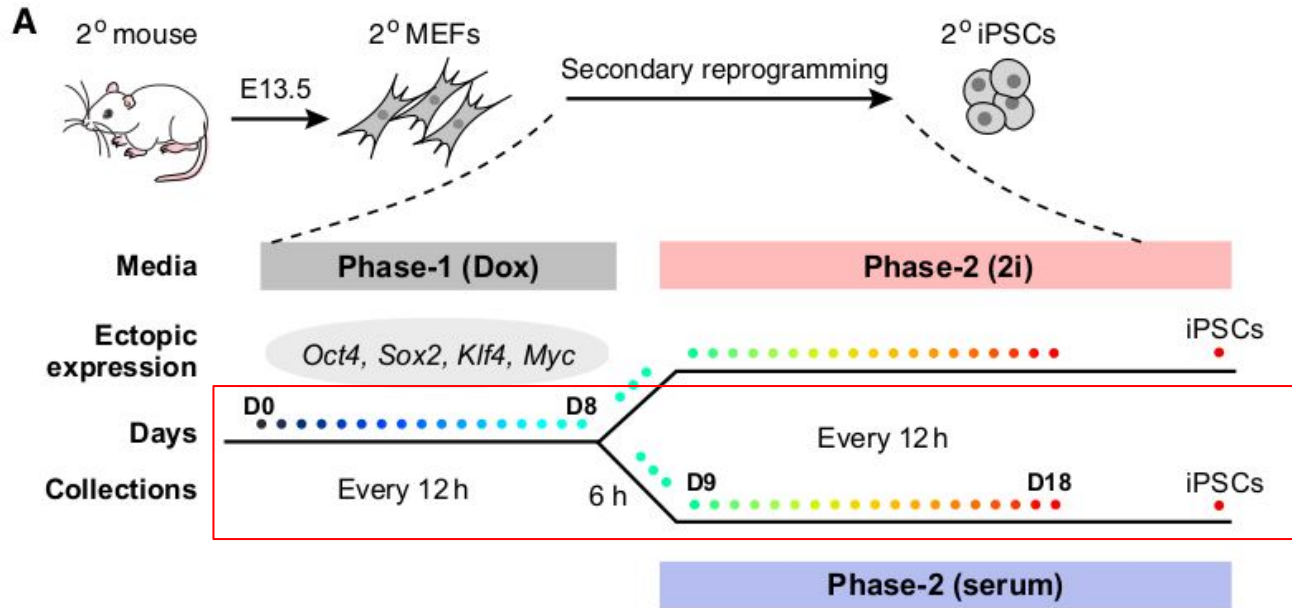
Normalization



legend
+ WOT_1d
+ WOT_2d
+ WOT_4d
+ random_1d
+ baseline_1d

WOT-data set

37 time points, every 0.5 day

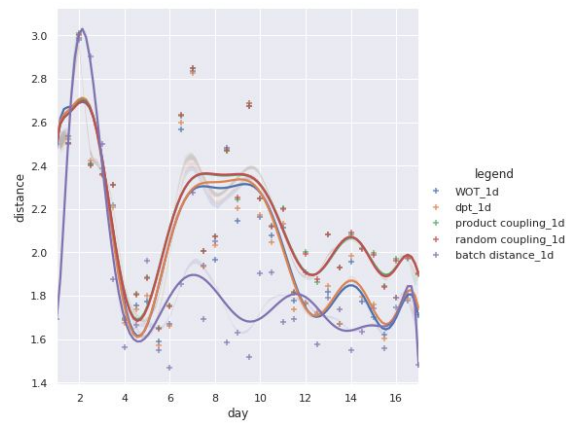
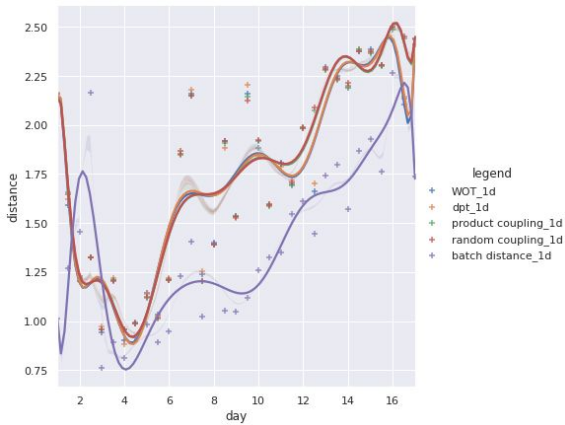
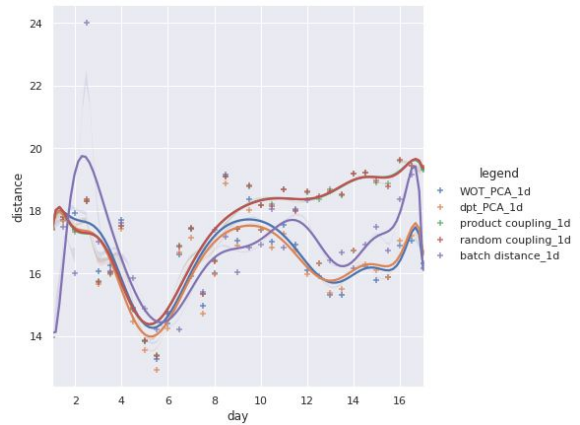


PCA

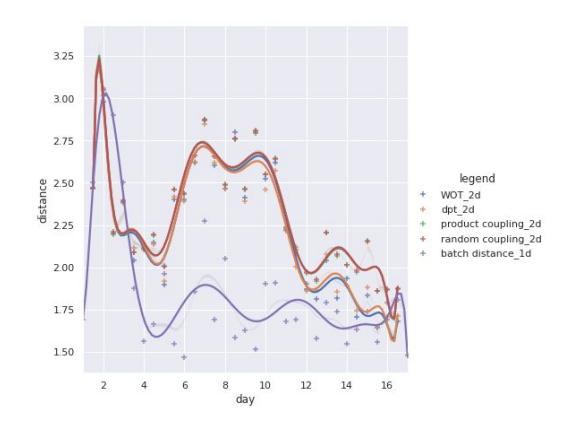
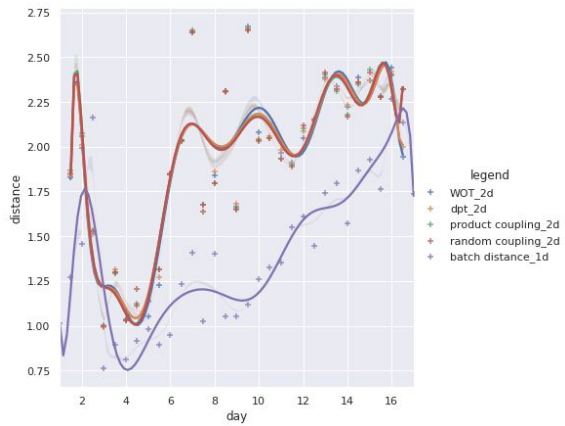
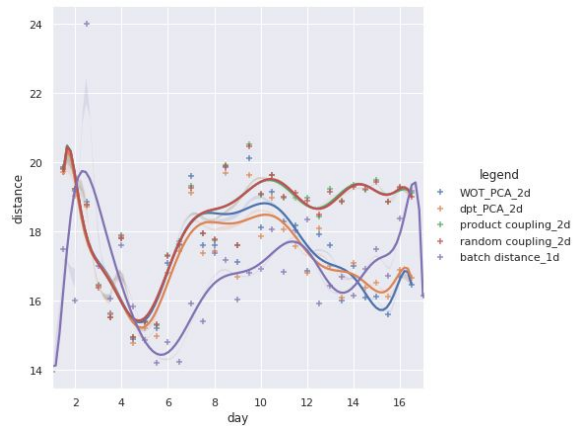
Global scVI

Local scVI

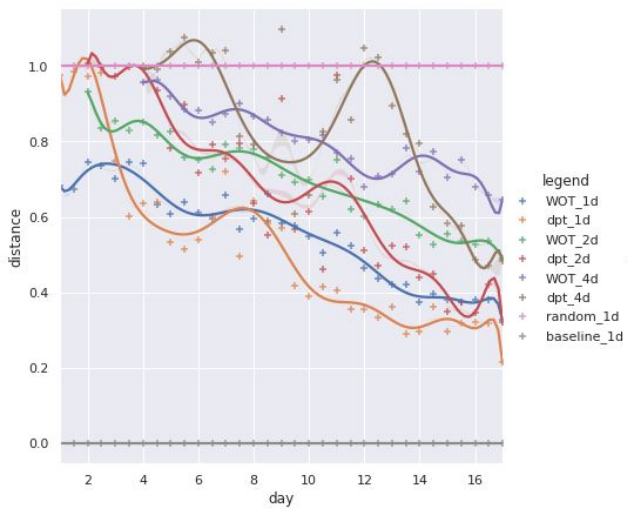
1 day



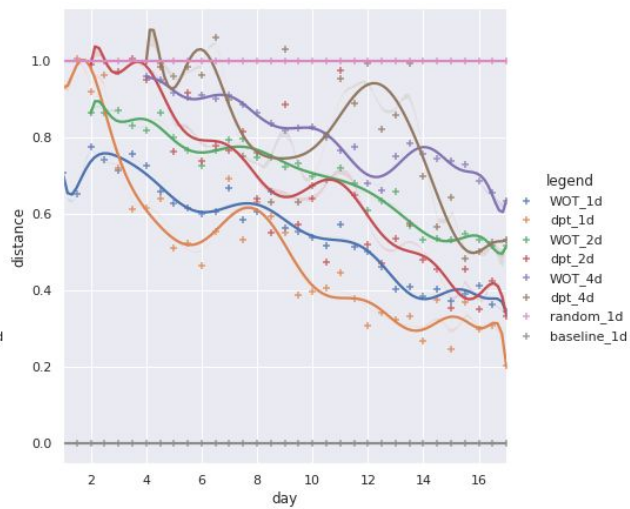
2 day



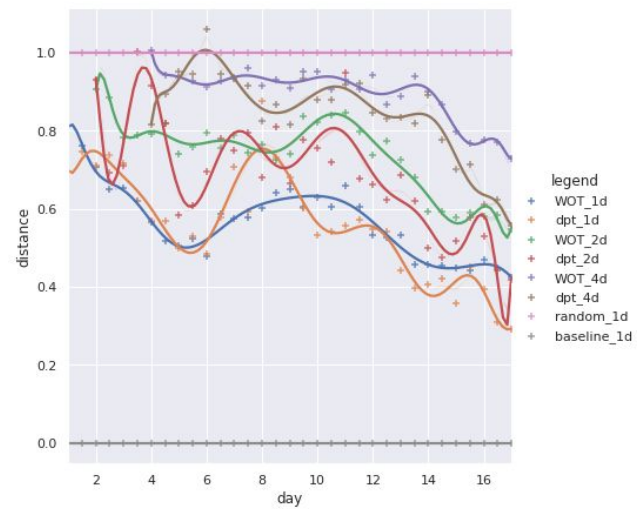
PCA



Global scVI

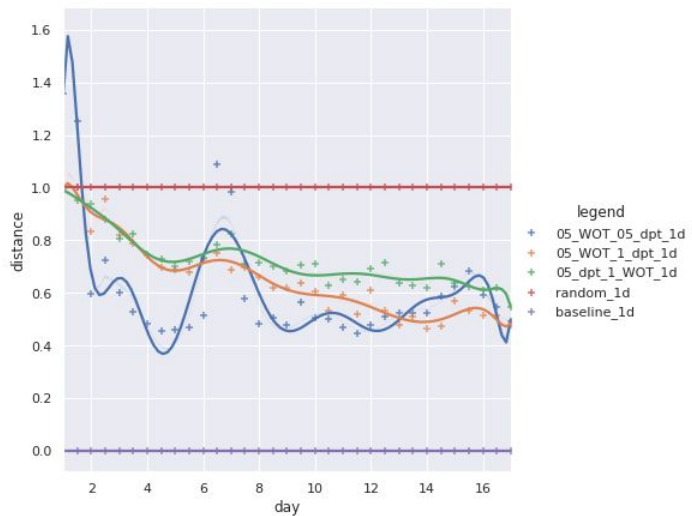


Local scVI

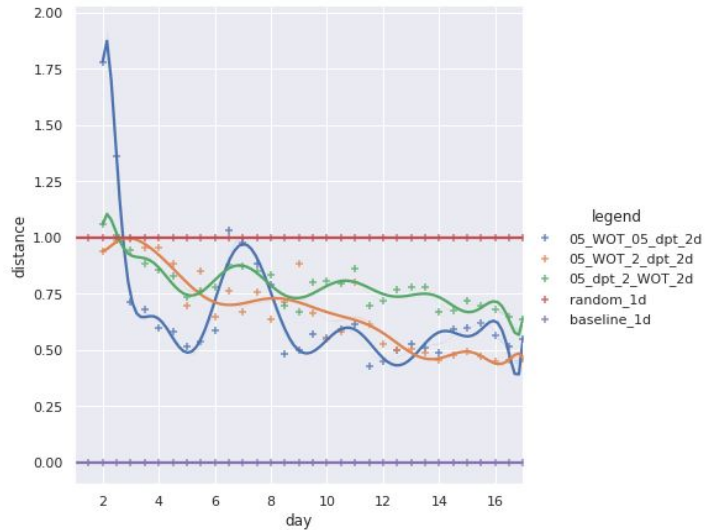


WOT-data set

Global scVI



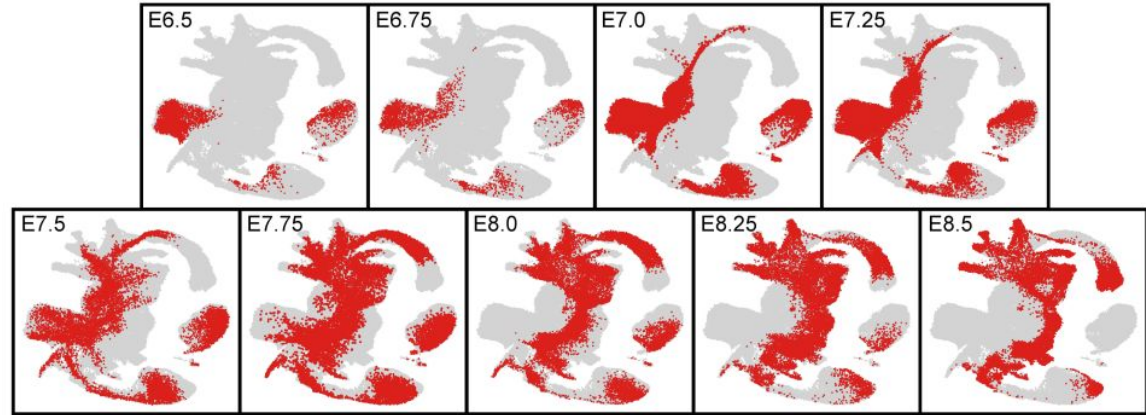
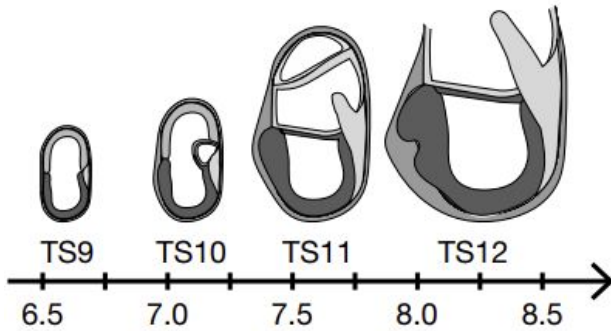
Cross - total of 1 day



Cross - total of 2 days

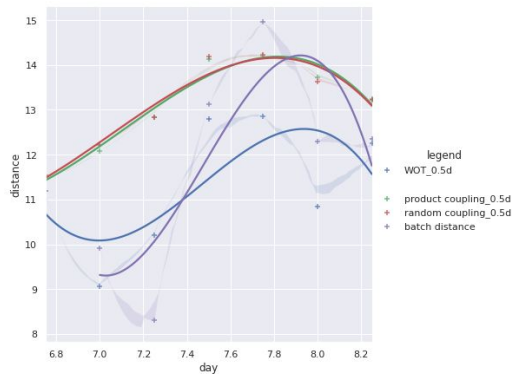
Mouse Gastrulation

9 time points, every 0.25 day

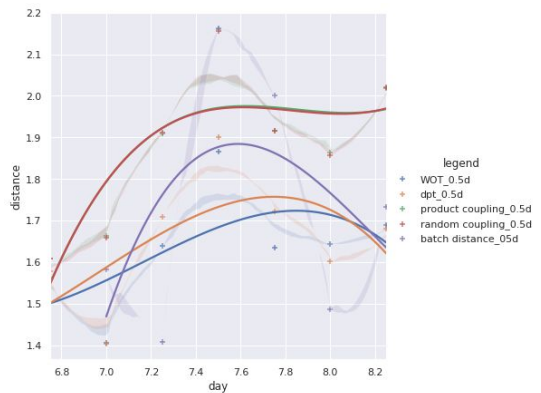


PCA

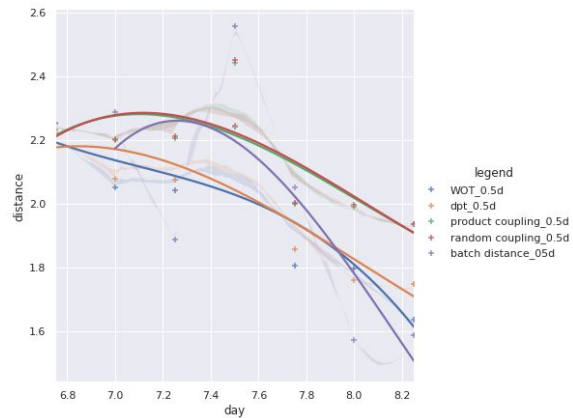
0.5 day



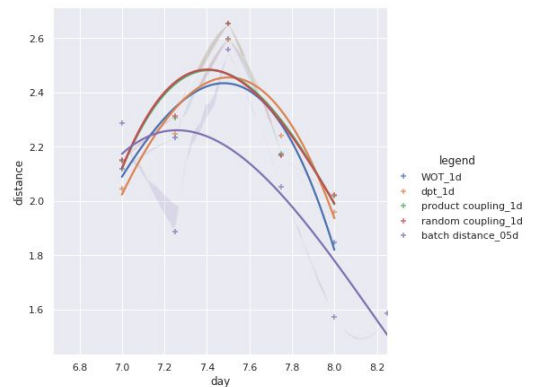
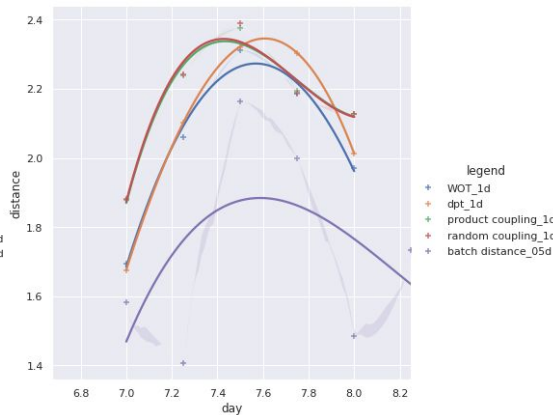
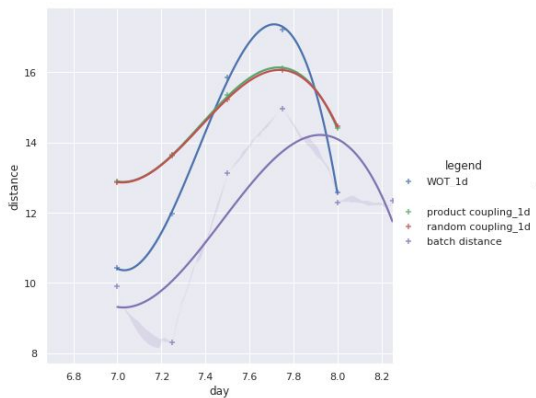
Global scVI



Local scVI

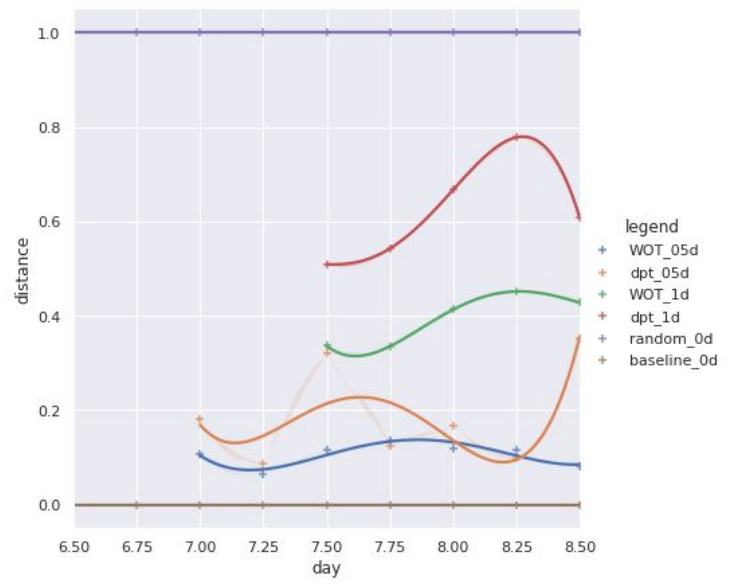


1 day

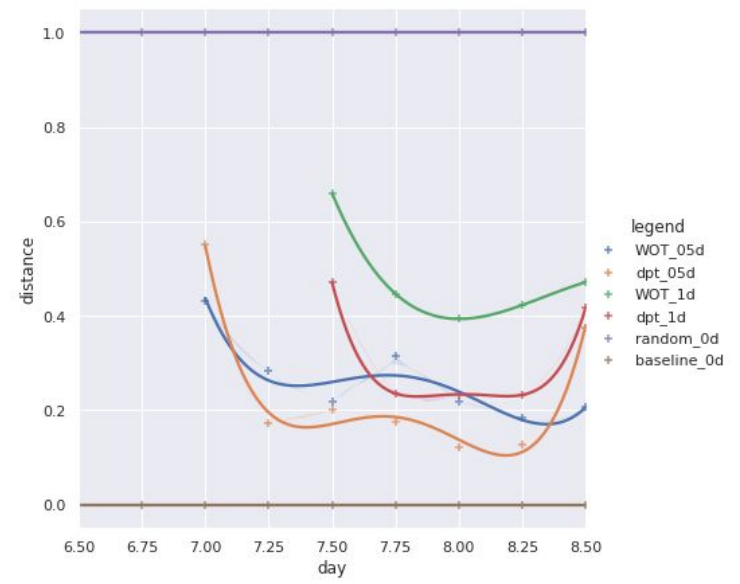


Mouse Gastrulation

Global scVI

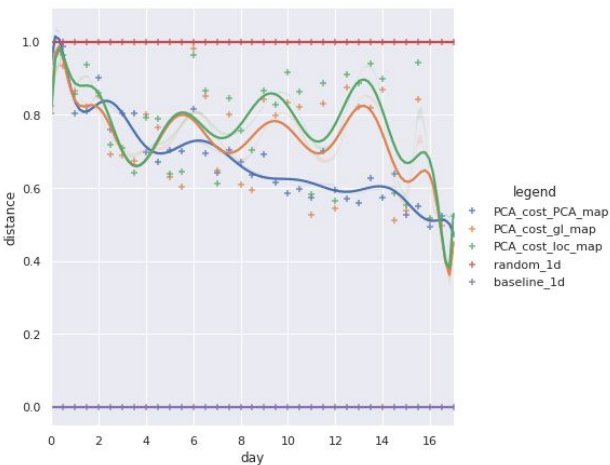


Local scVI

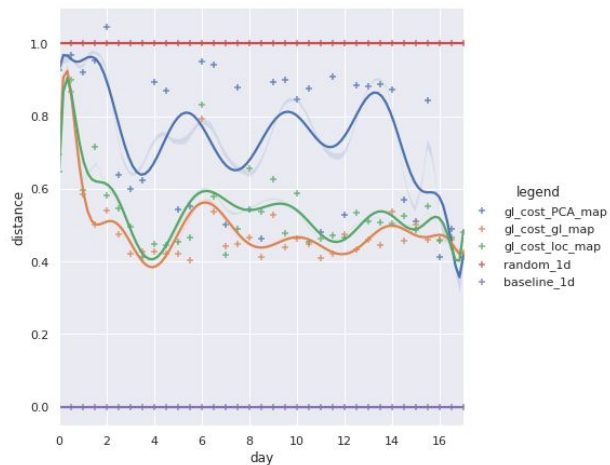


Choosing representation

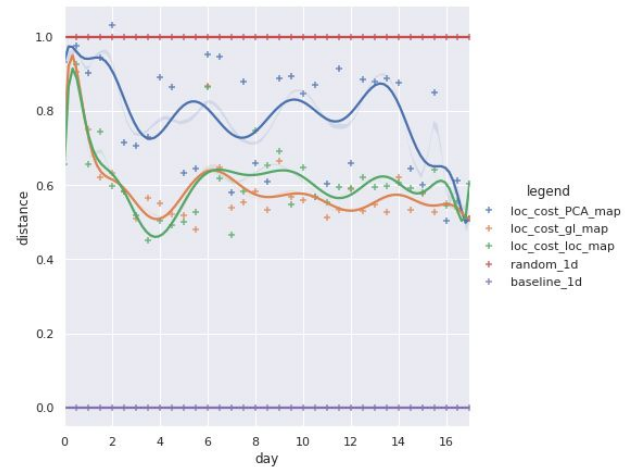
PCA space



Global scVI



Local scVI



Comparing 1x0.5d-WOT-matrix to 1x0.5d-dpt-matrix
 cost=space in which emd was calculated
 map=representation used to calculate T-maps

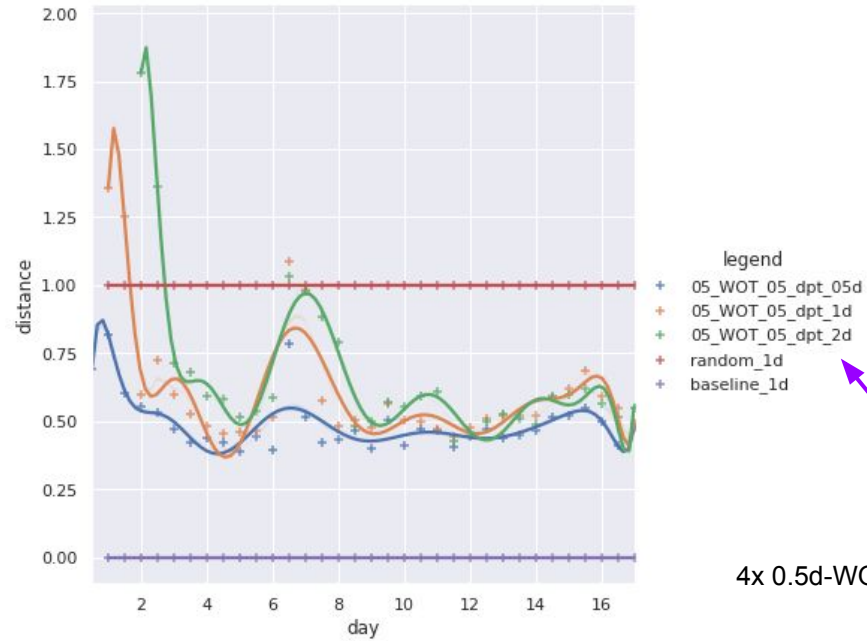
Summary

- Push consistency can be used as a validation metric
- Using geodesics, L2 and dpt perform similarly well
- Using push-consistency, dpt seems to perform better
- Global scVI representation

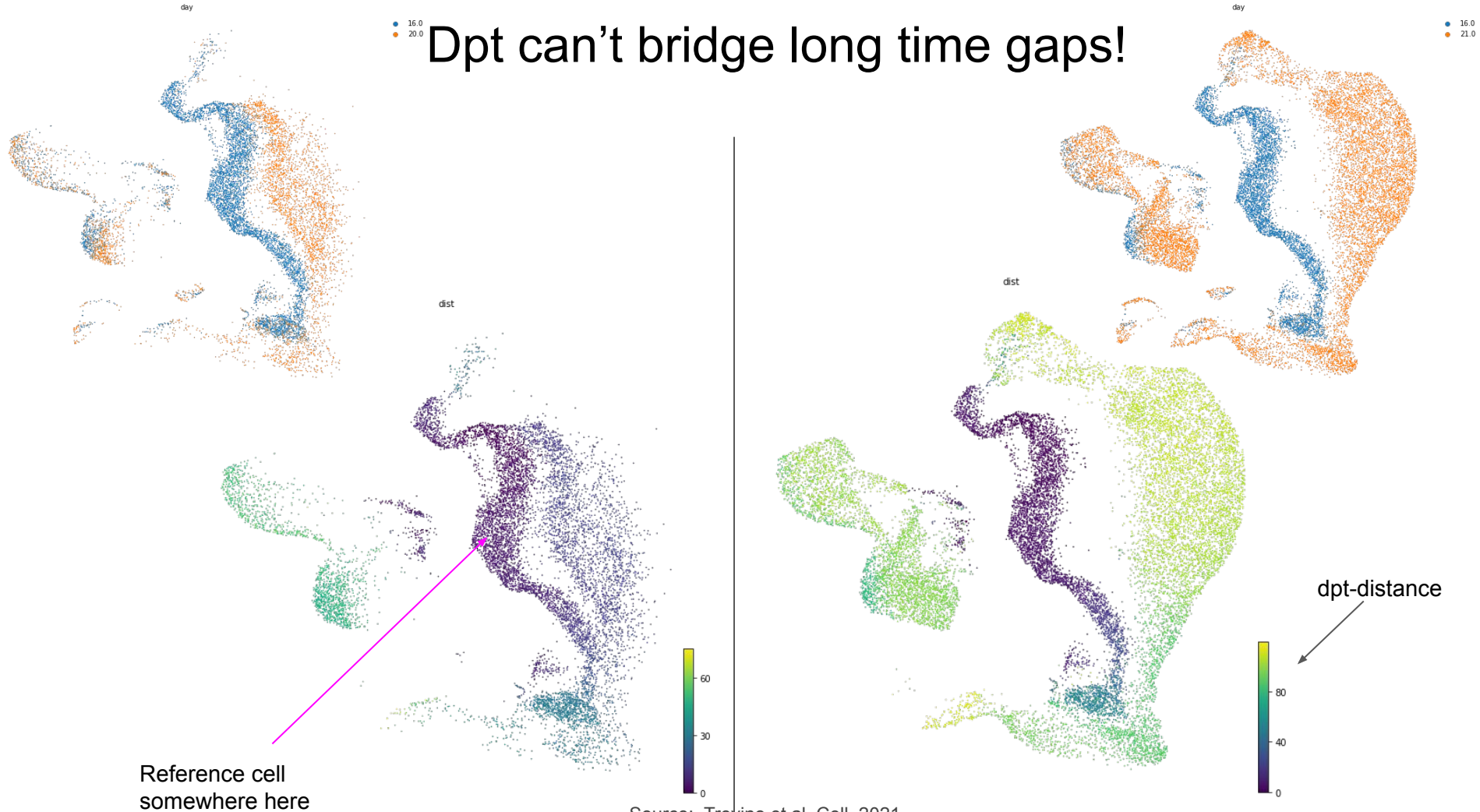
Supplementary slides

Push-consistency

Global scVI



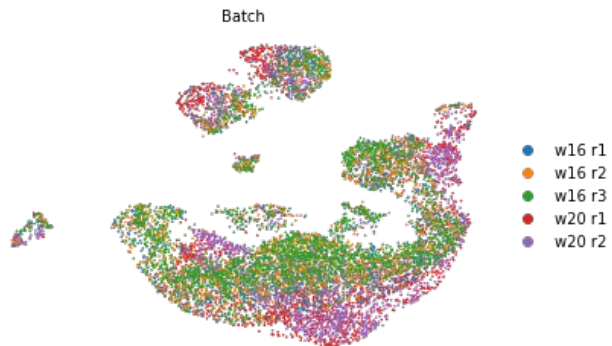
Dpt can't bridge long time gaps!



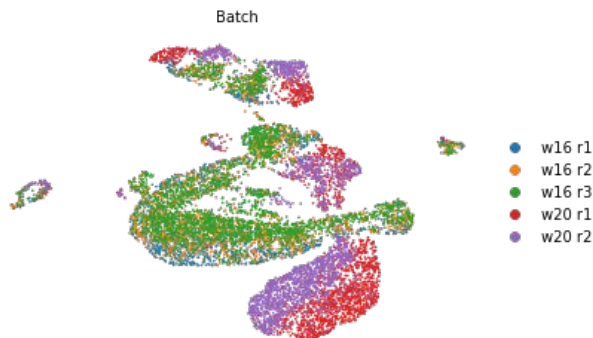
Source: Trevino et al, Cell, 2021.

Batch correction for time-series data

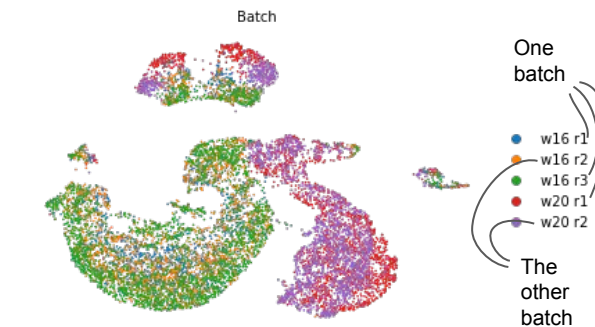
All 5 as different batches



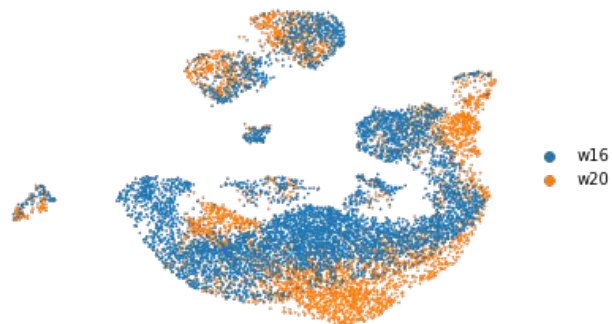
No batch correction



“Pseudo”-batch correction



Timepoint



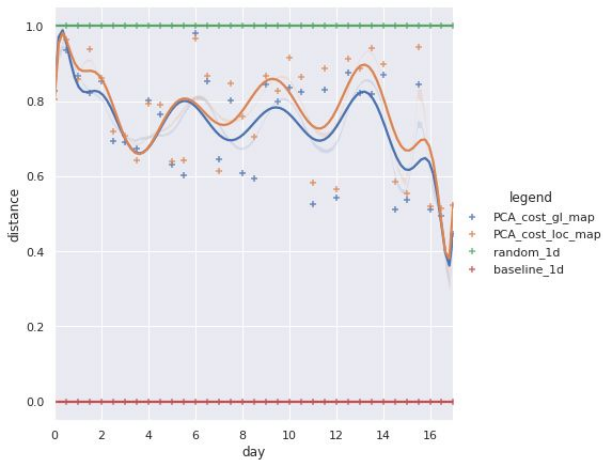
Timepoint



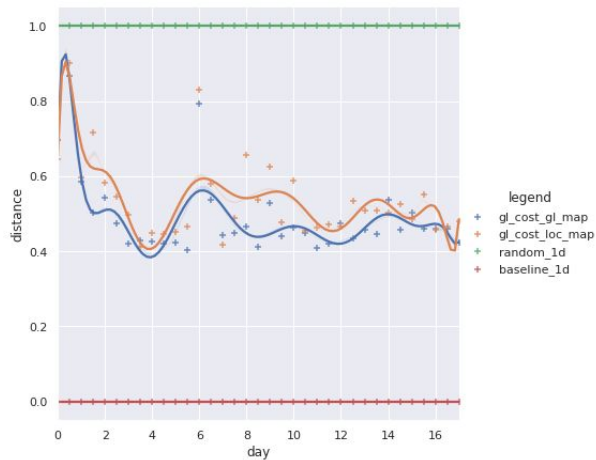
Timepoint



PCA space



Global scVI



Local scVI

