

# dyno: Inferring, Visualizing and Interpreting trajectories

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► dyno is a **toolkit** for inferring, visualizing and interpreting **trajectory inference methods** in R <http://dyno.dynverse.org>

## Selecting the most optimal method(s)

### Choice of method depends on the:

**User** Expectations about the topology  
Available computing resources  
Relative importance to particular trajectory aspects

**Data** Number of cells and features  
Prior information (such as start cells)

► Our app gives **recommendations** based on these criteria

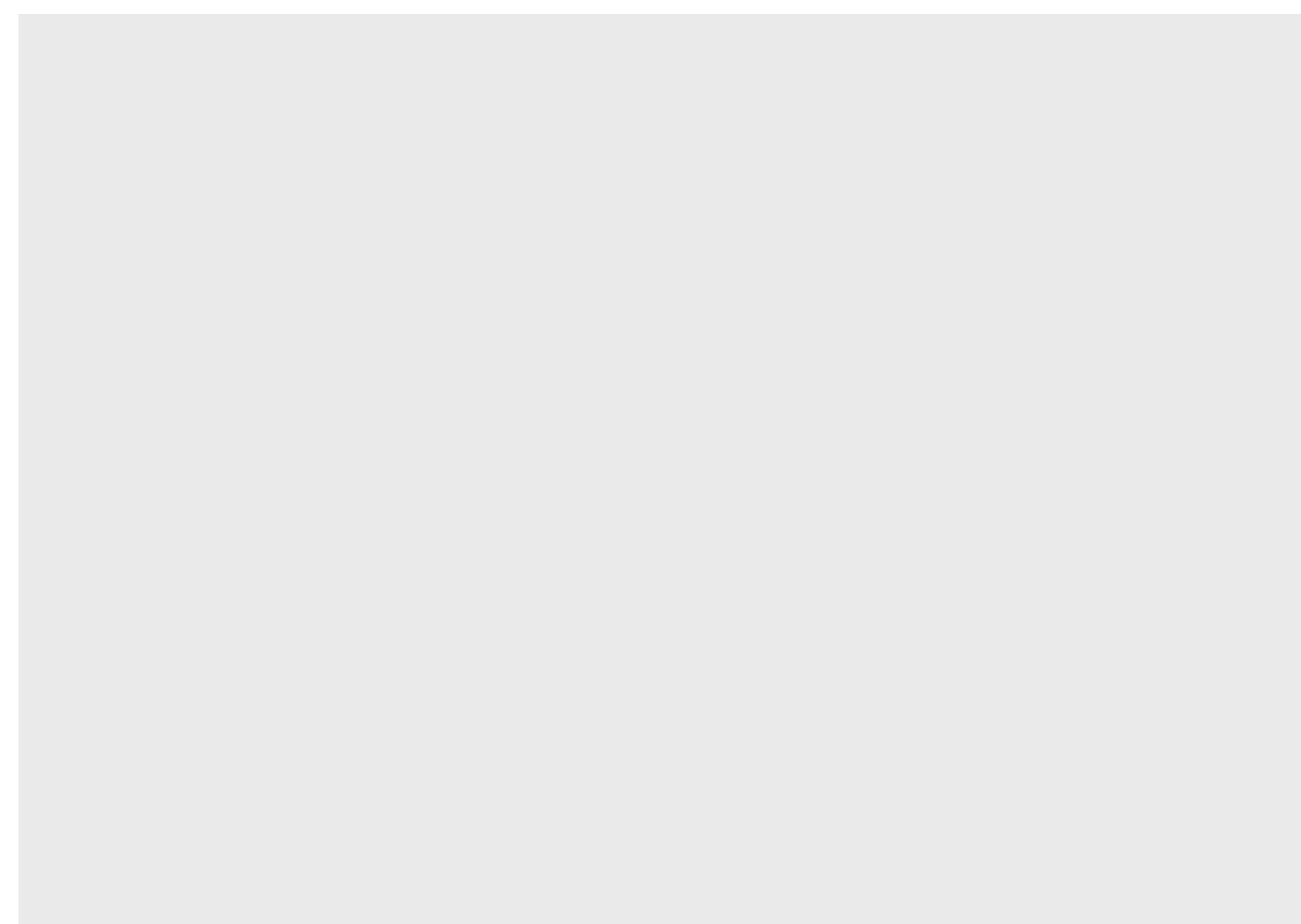
Install locally in R: `devtools::install_github("dynverse/dynguidelines")`

Or go to: <http://guidelines.dynverse.org>

► These recommendations use the results from our **benchmark**:

Poster 1033 <http://benchmark.dynverse.org> Published soon!

### Examples:



## Inferring trajectories

### 71 tools for trajectory inference

...and counting  
...each with their own interface...

► We developed a **common input and output interface** for **55 methods**

► Each method can be run with one line

`infer_trajectory(dataset, "my_favorite_ti_method")`

► Next methods can be included through

<http://methods.dynverse.org>

### Input

- Raw counts
- Normalised counts
- RNA velocity (soon!)
- Default parameters
- Start cell(s)
- End cell(s)
- Cell groups
- Timecourse
- # of end states
- # of branches
- Marker genes

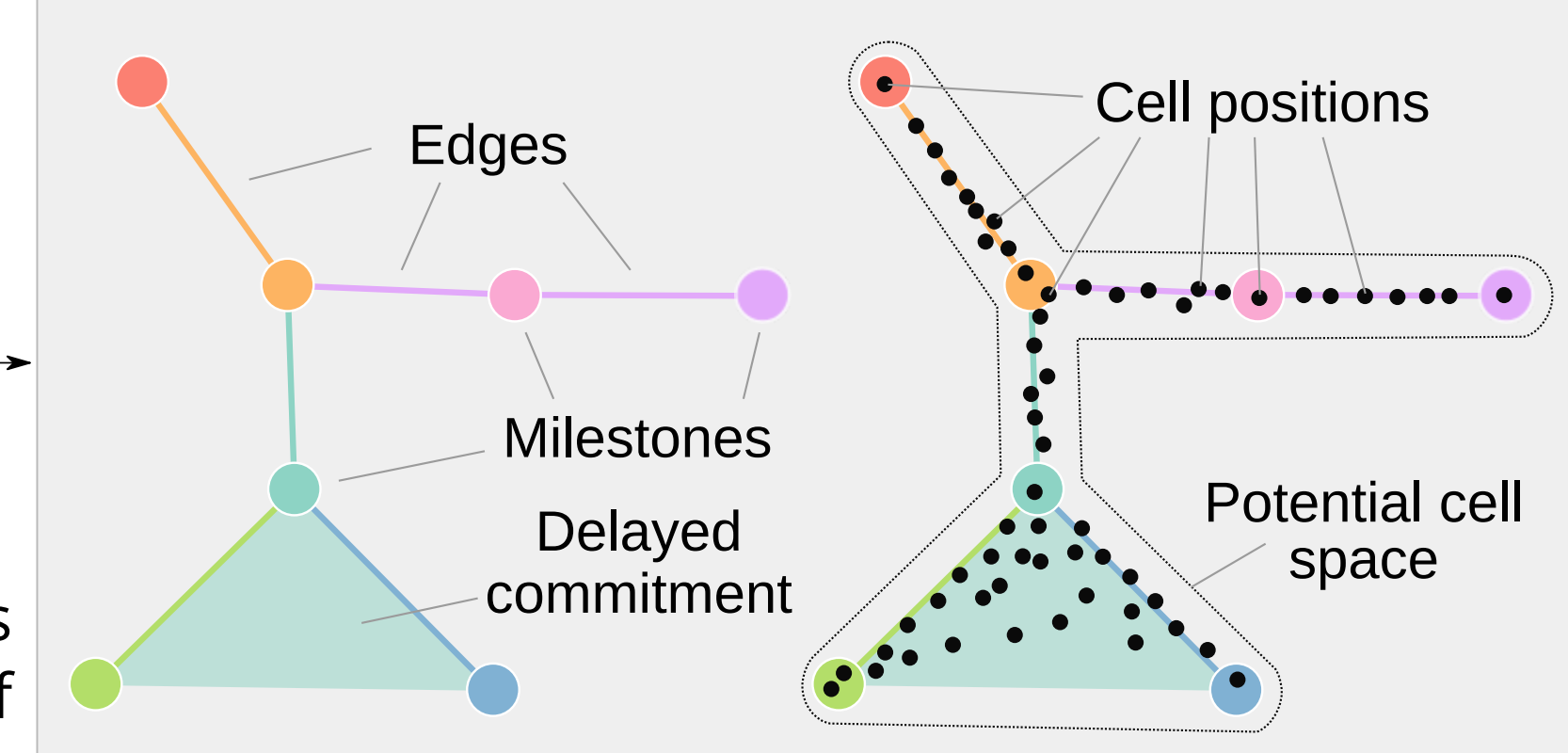
### Trajectory inference

TI method

required or optional prior information

outputs subset of

### Common probabilistic trajectory model



## Annotating the trajectory

► Include additional information on top of the trajectory to make it **interpretable**

► Rooting based on markers (or manually)

► (soon!) Directionality of edges based on RNA velocity

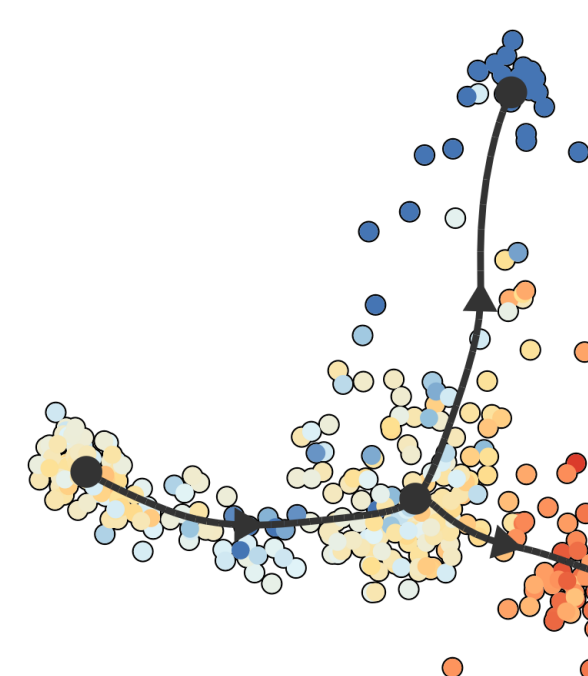
► Labelling milestones based on markers (or manually)

► We welcome additional ideas about common operations

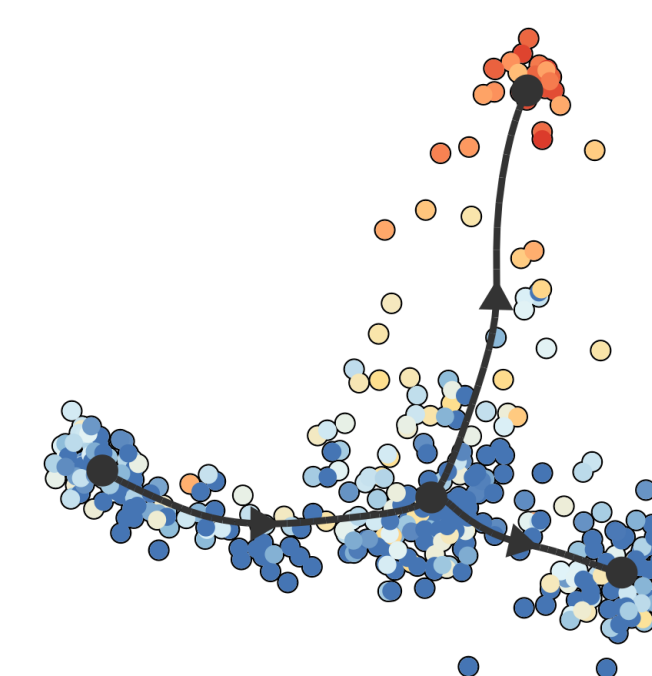
## Detecting differential expression

► Various **expression patterns** can be detected

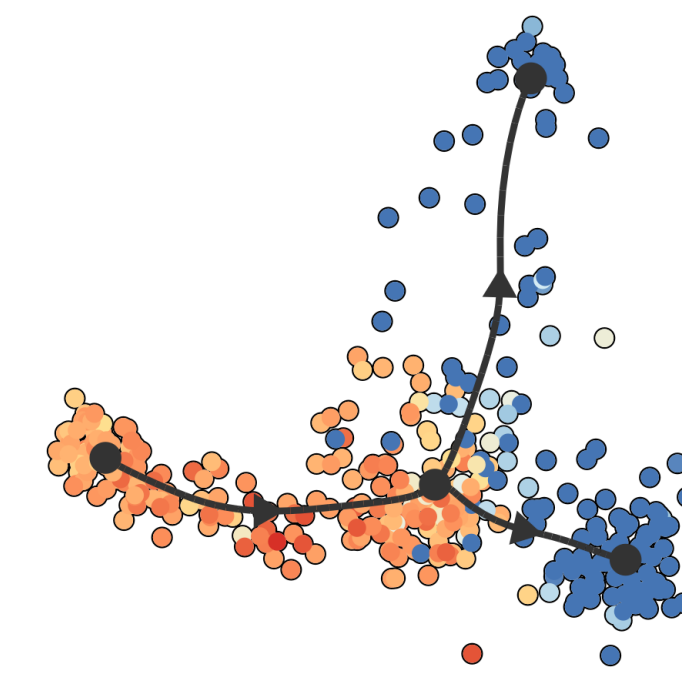
### Overall



### Branch

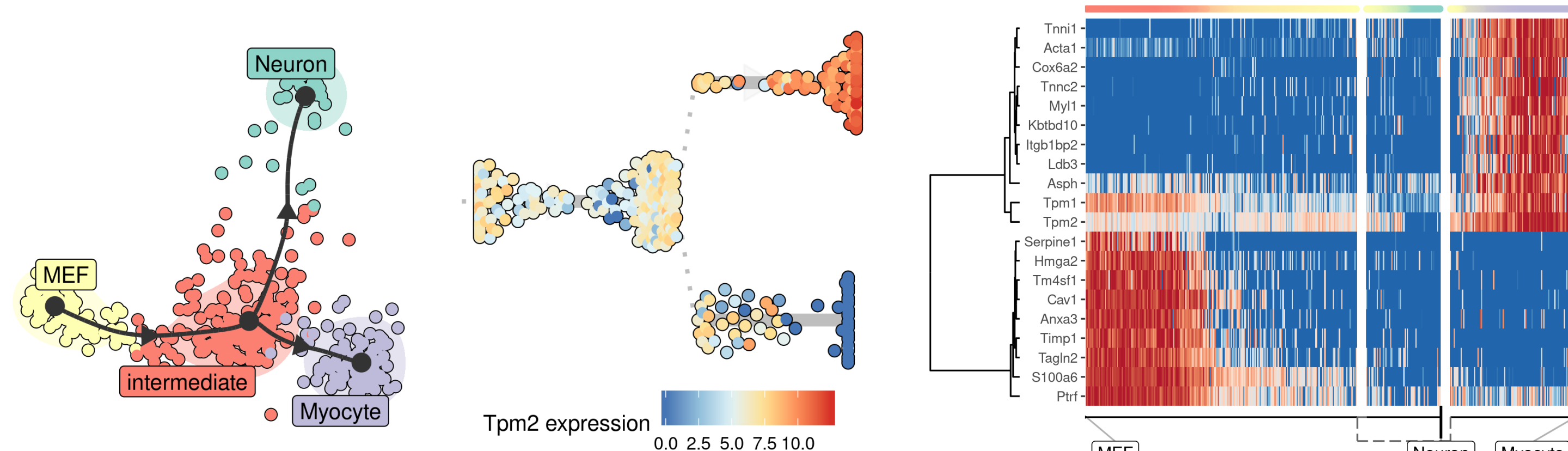


### Branch point



## Visualizing the trajectory

► Visualize a trajectory in multiple ways



► Compare models on a common embedding

