

|                                       | splatter | powsimR | PROSSTT        | SymSim | dyngen         |
|---------------------------------------|----------|---------|----------------|--------|----------------|
| <b>Available modality outputs</b>     |          |         |                |        |                |
| - mRNA expression                     | ✓        | ✓       | ✓              | ✓      | ✓              |
| - Pre-mRNA expression                 |          |         |                |        | ✓              |
| - Protein expression                  |          |         |                |        | ✓              |
| - Promotor activity                   |          |         |                | ✓      | ✓              |
| - Reaction activity                   |          |         |                |        | ✓              |
| <b>Available ground-truth outputs</b> |          |         |                |        |                |
| - True counts                         | ✓        |         |                | ✓      | ✓              |
| - Cluster labels                      | ✓        | ✓       |                | ✓      | ✓              |
| - Trajectory                          | ✓        |         | ✓ <sup>1</sup> | ✓      | ✓              |
| - Batch labels                        | ✓        |         |                |        | ✓ <sup>1</sup> |
| - Differential expression             |          |         |                | ✓      | ✓ <sup>2</sup> |
| - Knocked down regulators             |          |         |                |        | ✓              |
| - Regulatory network                  |          |         |                | ✓      | ✓              |
| - Cell-specific regulatory network    |          |         |                |        | ✓              |
| <b>Emulate experimental effects</b>   |          |         |                |        |                |
| - Single-cell RNA sequencing          | ✓        | ✓       | ✓              | ✓      | ✓              |
| - Batch effects                       | ✓        |         |                |        | ✓ <sup>1</sup> |
| - Knockdown experiment                |          |         |                |        | ✓              |
| - Time-series                         |          |         |                |        | ✓              |
| - Snapshot                            |          |         |                |        | ✓              |
| <b>Evaluation applications</b>        |          |         |                |        |                |
| - Clustering                          | ✓        | ✓       |                | ✓      |                |
| - Trajectory inference                | ✓        |         | ✓              | ✓      | ✓              |
| - Network inference                   |          |         |                | ✓      | ✓              |
| - Cell-specific network inference     |          |         |                |        | ✓              |
| - Differential expression             | ✓        |         |                |        | ✓ <sup>2</sup> |
| - Batch effect correction             | ✓        |         |                |        | ✓              |
| - RNA Velocity                        |          |         |                |        | ✓              |
| - Trajectory alignment                |          |         |                |        | ✓              |
| <b>Showcased dataset</b>              |          |         |                |        |                |
| - Number of cells                     |          |         |                |        |                |
| - Number of genes                     |          |         |                |        |                |
| - Execution time                      |          |         |                |        |                |