**Table S1: Identifiers of the data used in this study**

|  |  |  |
| --- | --- | --- |
| data | SOURCE | IDENTIFIER |
| Biase  Kolodz.  Yan  Goolam  Pollen  Deng  Klein  Zeisel  Rca  Treutlein  Baron  Usoskin | Biase et al., 2014  Kolodziejczyk et al., 2015  Yang et al., 2013  Goolam et al., 2016  Pollen et al., 2014  Deng et al., 2014  Klein et al., 2015  Zeisel et al., 2015  Li et al., 2017  Treutlein et al., 2014  Baron et al., 2016  Usoskin et al., 2015 | GEO: GSE57249  E-MTAB-2600  GEO: GSE36552  E-MTAB-3321  SRP041736  GEO: GSE45719  GEO: GSE65525  GEO: GSE60361  GEO: GSE81861  GEO: GSE52583  GEO: GSE84133  GEO: GSE59739 |

**Table S2: the results of scSO in different ARI threshold**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ARI threshold | scSO | SC3 | Scanpy | Seurat | SIMLR |
| 0.80 | 7 | 3 | 1 | 1 | 1 |
| 0.75 | 9 | 5 | 1 | 1 | 1 |
| 0.70 | 9 | 5 | 4 | 2 | 1 |
| 0.65 | 10 | 5 | 5 | 3 | 2 |
| 0.60 | 10 | 6 | 5 | 4 | 2 |