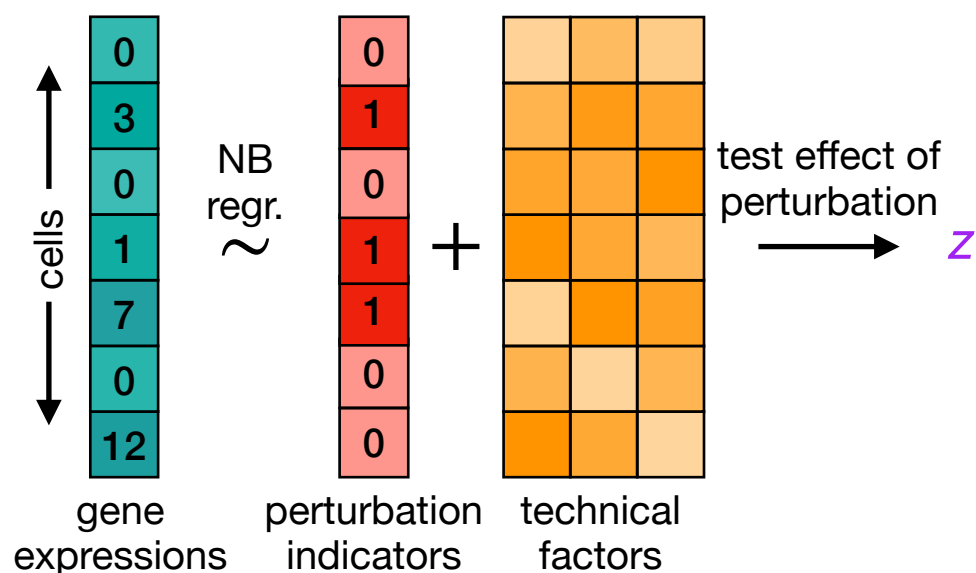
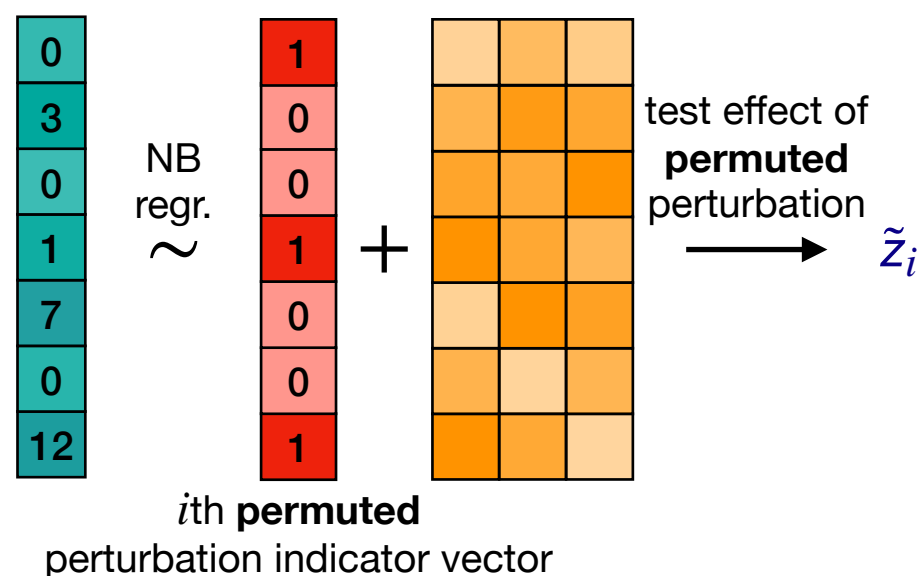


a

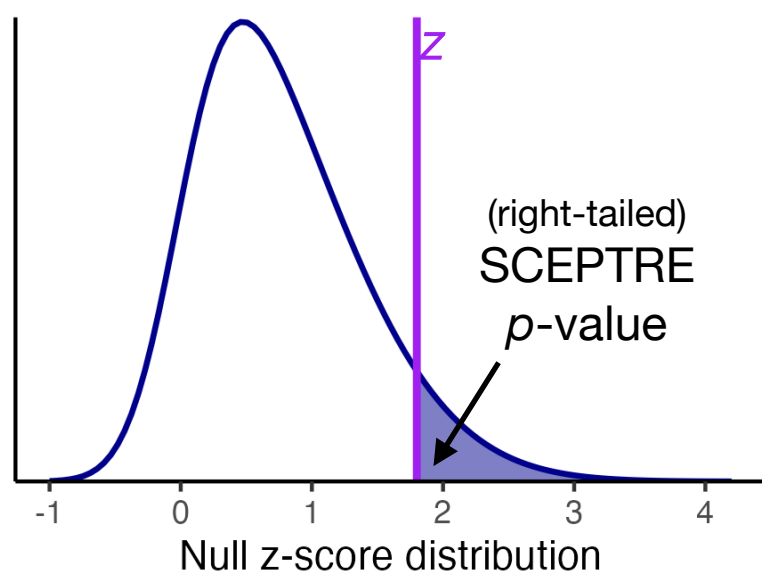
- ① Obtain z-score from NB regression of gene expression on perturbation indicator and technical factors



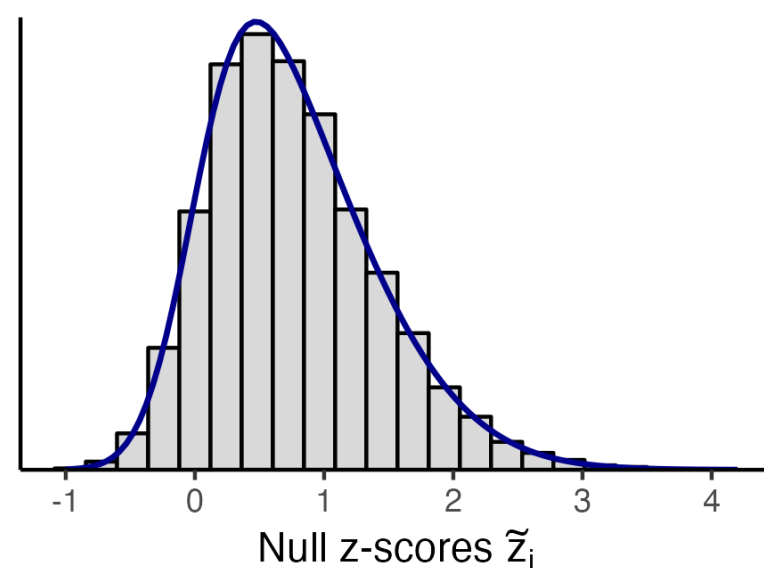
- ② For $i = 1, \dots, M$:
Permute perturbation indicator and rerun NB regression to obtain null z-score \tilde{z}_i



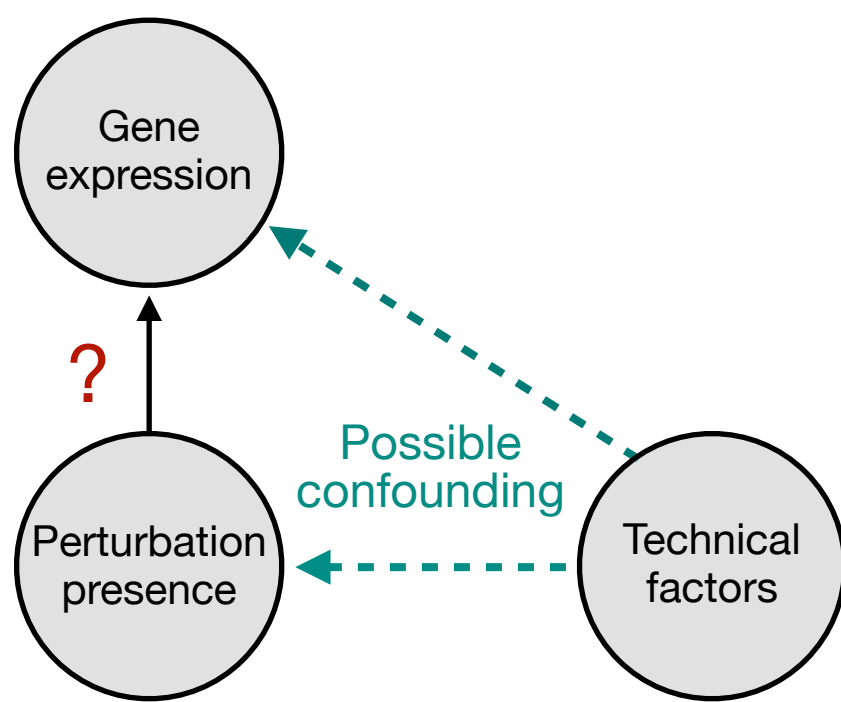
- ④ Obtain p-value by comparing original z-score z to fitted null distribution



- ③ Fit smooth curve to null z-scores \tilde{z}_i

**b**

Relationships among variables

**c**

Robustness property of SCEPTRE

