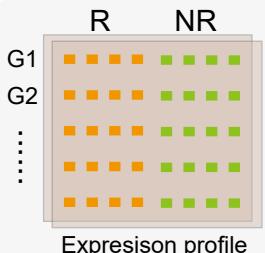
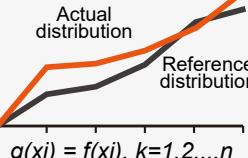


## A Part 1. Ranking genes associated with response to immunotherapy

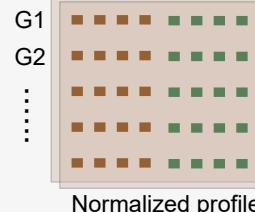
### Normalized profile



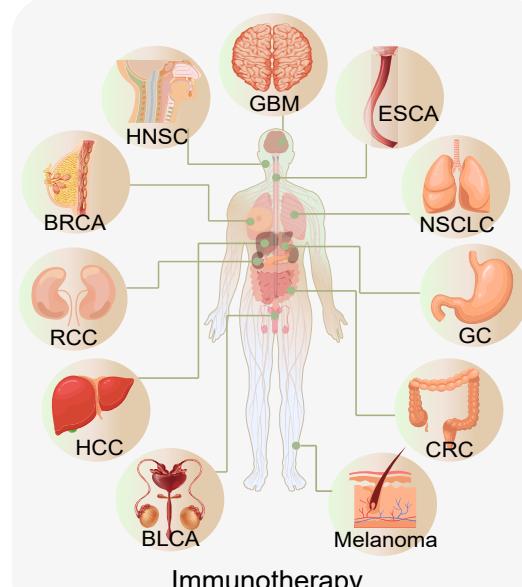
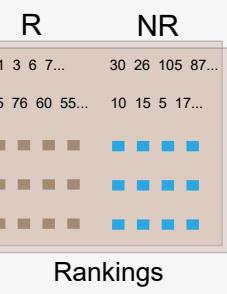
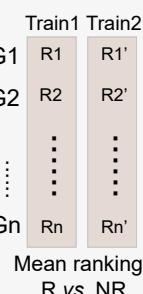
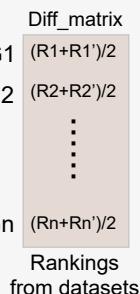
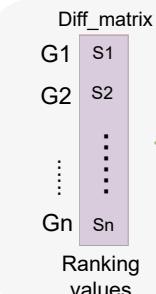
Sample(i)



R NR

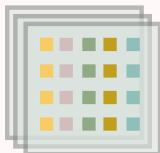


### Gene ranking matrix

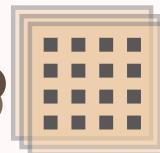


## B Part 2. Evaluate of the deviation

### Input data

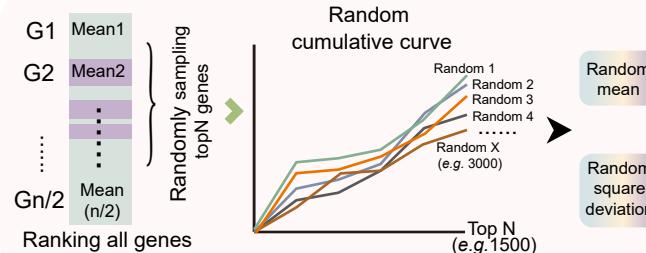


scRNA-seq



Bulk RNA-seq

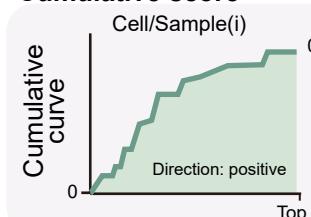
### Calculate random deviation



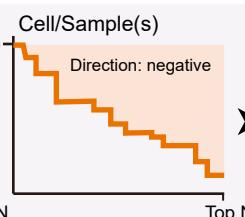
## C Part 3. Calculation of response score

### Cumulative score

Cell/Sample(i)



Cell/Sample(s)



Max\_pos  
Max\_neg

### Normalization

#### Response Score (RScore)

$$RScore = \frac{\text{Max\_pos or Max\_neg} - \text{Random mean}}{\text{Random square deviation}}$$

Position weight

G1	0.96
G2	0.82
⋮	⋮
Gn	0.0

Direction strength

$$\times \frac{|\text{Max\_pos}| \text{ or } |\text{Max\_neg}|}{|\text{Max\_pos}| + |\text{Max\_neg}|}$$