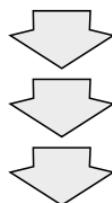


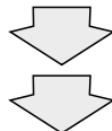
input data: more than one ExpressionSet with valid annotation link

**ExpressionSet A**

**ExpressionSet B**



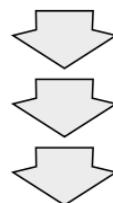
extract chip platform



load current annotation, respectively



if not available, fetch from internet



**Experiment study A**

| ID      | sample x | sample y | sample z |
|---------|----------|----------|----------|
| probe x | 5.1      | 5.2      | 5.005    |
| probe y | 8.3      | 9.1      | 8.4      |
| probe z | 12.8     | 13.1     | 12.9     |
| ...     | ...      | ...      | ...      |

**raw expression data**

**Experiment study B**

| ID      | sample a | sample b | sample c |
|---------|----------|----------|----------|
| probe a | 5.2      | 5.005    | 5.1      |
| probe b | 9.1      | 8.4      | 8.3      |
| probe c | 12.9     | 12.8     | 13.1     |
| ...     | ...      | ...      | ...      |

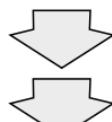


| ID      | symbol |
|---------|--------|
| probe x | XA1    |
| probe y | YB2    |
| probe z | ZC3    |
| ...     | ...    |

**current annotation**

| ID      | symbol |
|---------|--------|
| probe a | XA1    |
| probe b | YB2    |
| probe c | ZC3    |
| ...     | ...    |

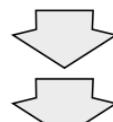
**current annotation**



discard non-matching lines



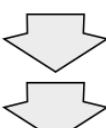
collapse multiple values targeting the same gene by given function



| ID  | sample x | sample y | sample z |
|-----|----------|----------|----------|
| XA1 | 5.1      | 5.2      | 5.005    |
| YB2 | 8.3      | 9.1      | 8.4      |
| ZC3 | 12.8     | 13.1     | 12.9     |
| ... | ...      | ...      | ...      |

**reannotated expression data**

| ID  | sample a | sample b | sample c |
|-----|----------|----------|----------|
| XA1 | 5.2      | 5.005    | 5.1      |
| YB2 | 9.1      | 8.4      | 8.3      |
| ZC3 | 12.9     | 12.8     | 13.1     |
| ... | ...      | ...      | ...      |



discard non-matching lines



concatenate expression matrices

**combined expression matrix**

| ID  | batch 1  | batch 1  | batch 1  | batch 2  | batch 2  | batch 2  |
|-----|----------|----------|----------|----------|----------|----------|
|     | sample x | sample y | sample z | sample a | sample b | sample c |
| XA1 | 5.1      | 5.2      | 5.005    | 5.2      | 5.005    | 5.1      |
| YB2 | 8.3      | 9.1      | 8.4      | 9.1      | 8.4      | 8.3      |
| ZC3 | 12.8     | 13.1     | 12.9     | 12.9     | 12.8     | 13.1     |
| ... | ...      | ...      | ...      | ...      | ...      | ...      |

**batch effect removal using empirical bayes networks**

**modified expression matrix**

| ID  | batch 1  | batch 1  | batch 1  | batch 2  | batch 2  | batch 2  |
|-----|----------|----------|----------|----------|----------|----------|
|     | sample x | sample y | sample z | sample a | sample b | sample c |
| XA1 | 5.1      | 5.5      | 5.005    | 5.2      | 5.005    | 5.6      |
| YB2 | 8.3      | 9.1      | 8.4      | 10.1     | 8.4      | 8.3      |
| ZC3 | 10.0     | 13.1     | 12.9     | 12.9     | 12.8     | 13.1     |
| ... | ...      | ...      | ...      | ...      | ...      | ...      |