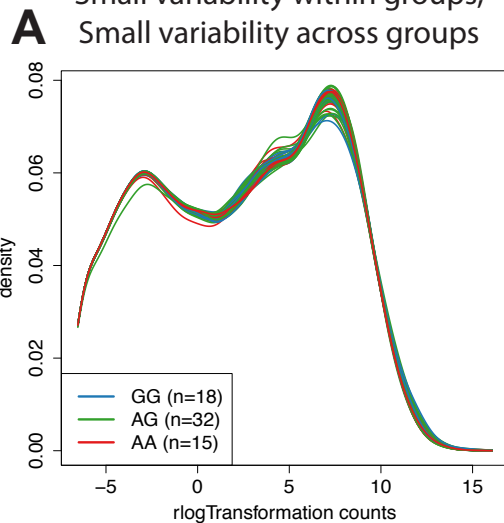


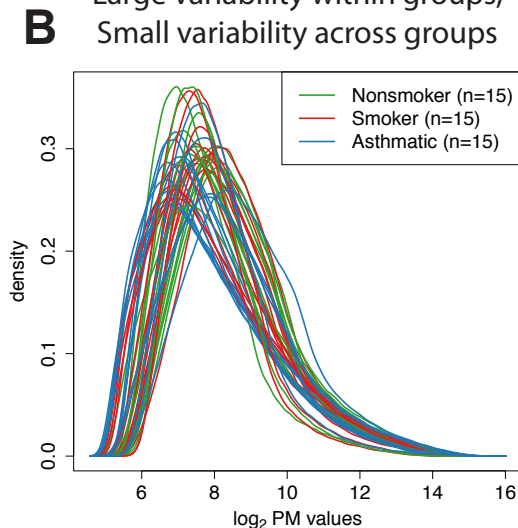
Targeted changes

Small variability within groups,
Small variability across groups



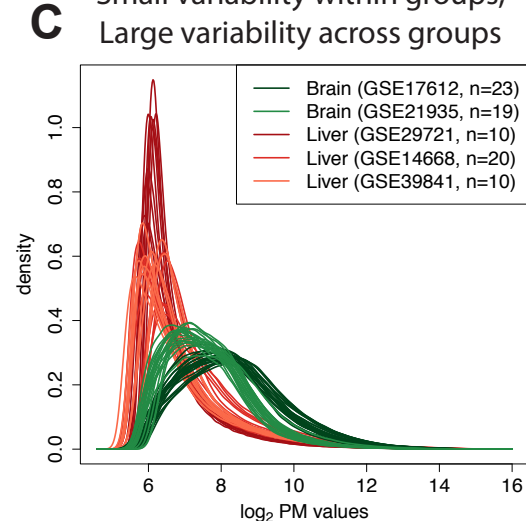
Targeted changes

Large variability within groups,
Small variability across groups



Global changes

Small variability within groups,
Large variability across groups



Observed variation

Reason?

Small technical variability;
no global changes

Large technical variability or
batch effects *within* groups;
no global changes

Global **technical**
variability or batch
effects *across* groups

Global **biological**
variability *across*
groups

Use quantile
normalization
(but not necessary)

Use quantile
normalization

Use quantile
normalization

Do not use quantile
normalization

What to do?

Raw data alone cannot
detect difference

quantro will detect global differences due to both
technical and biological variation