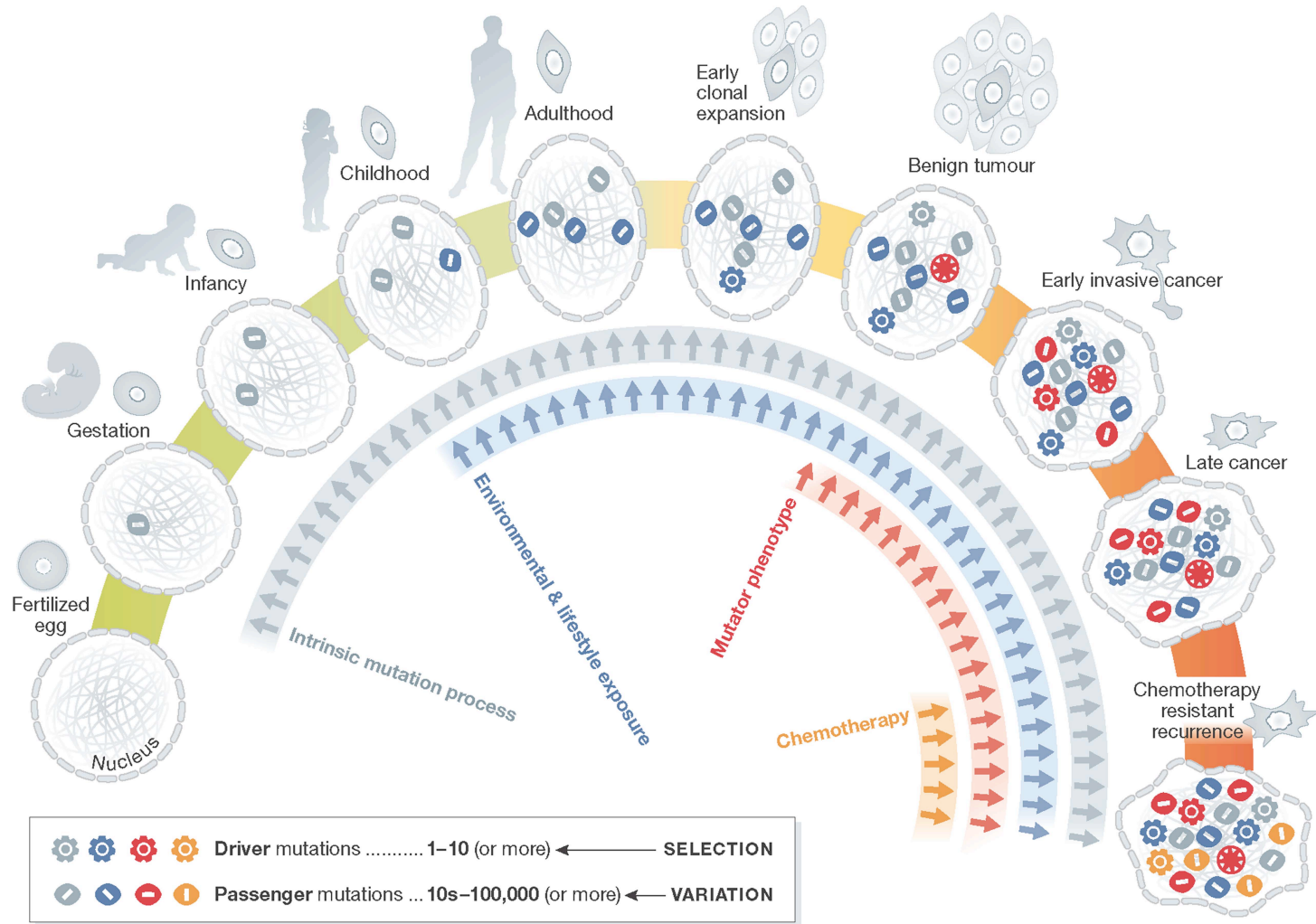


Mutational signature analysis

Introduction

Cohort analysis

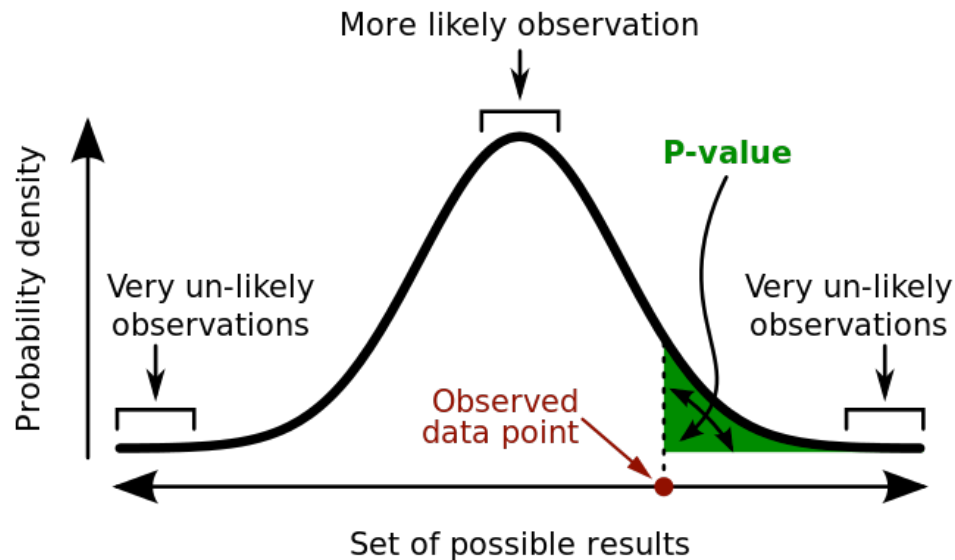


Stratton (EMBO Molecular Medicine 2013)

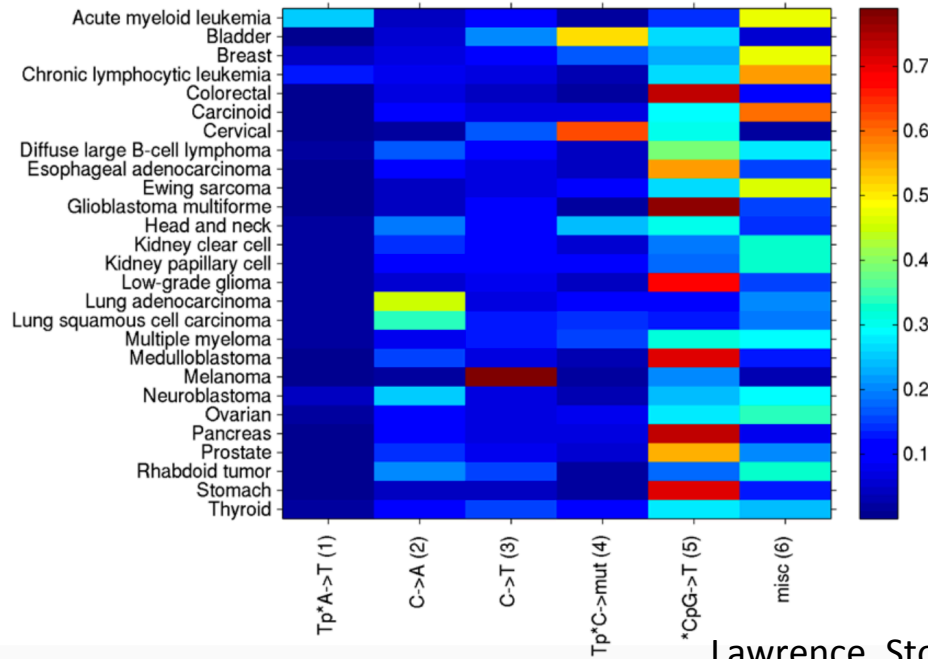
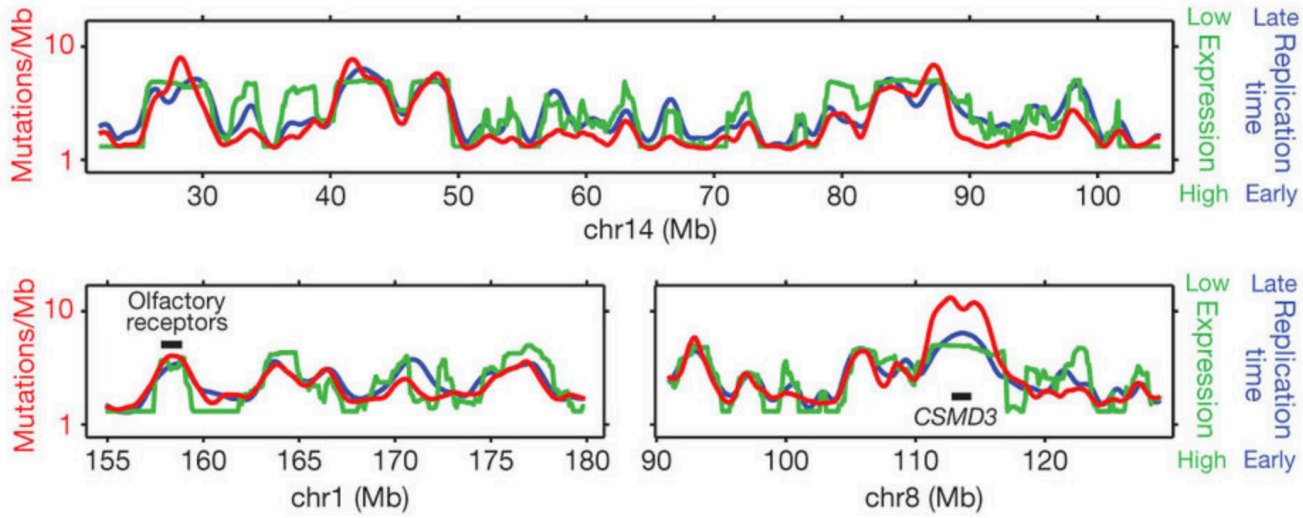
Frequently mutated genes - MutSigCV

Question:

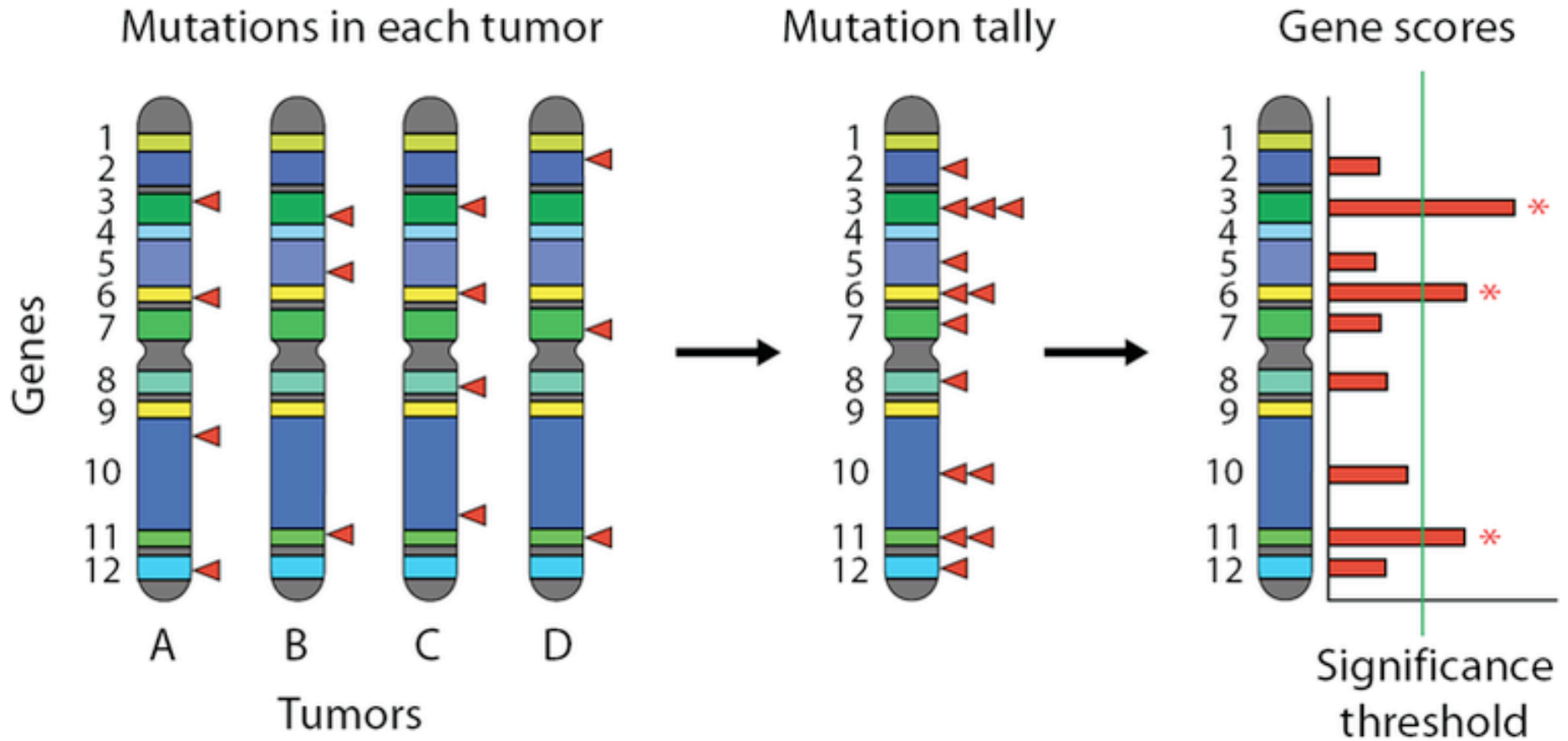
Which gene is hit by an SNV more often than expected in a cohort?



Characteristics of frequently mutated regions

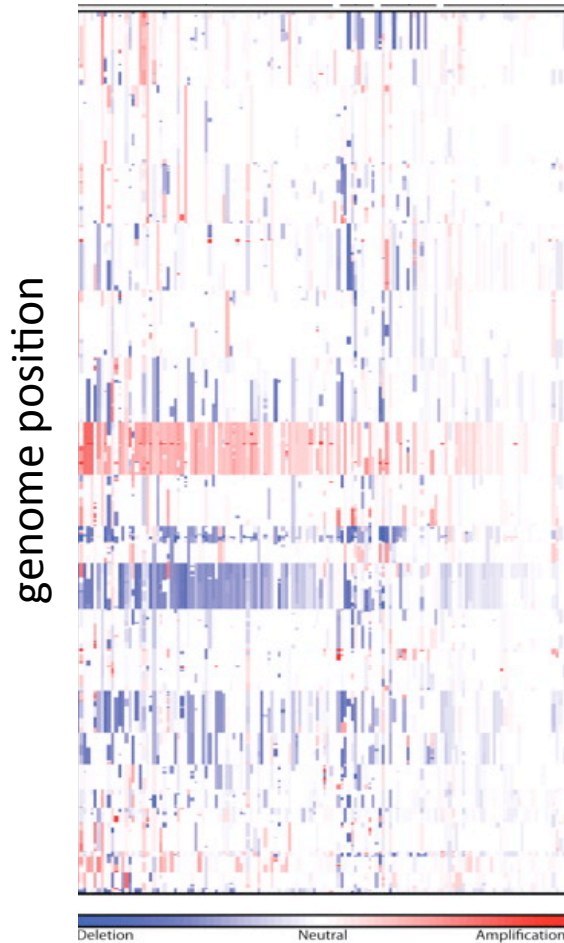


Frequently mutated genes



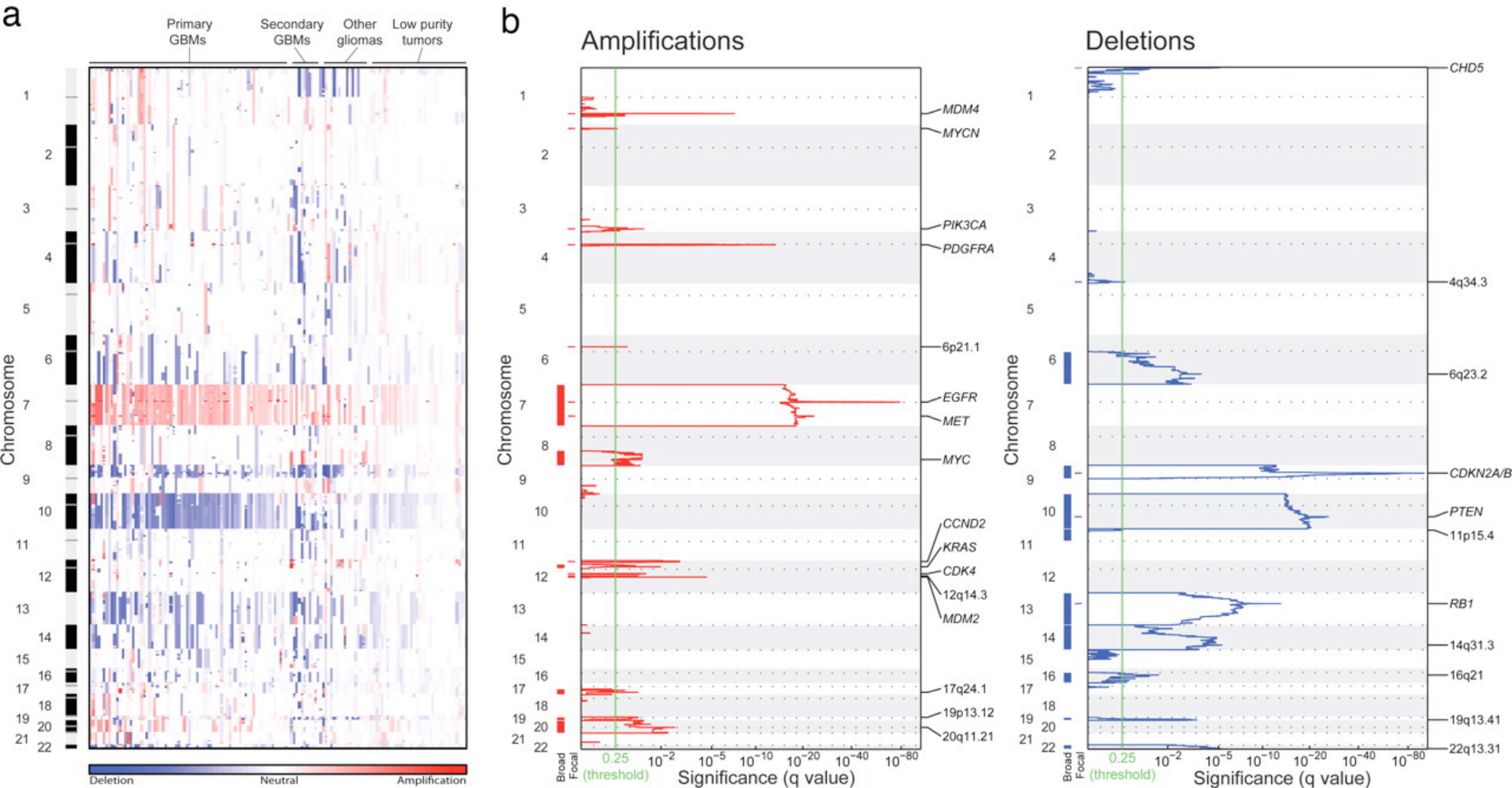
Frequent CNAs - GISTIC

patients



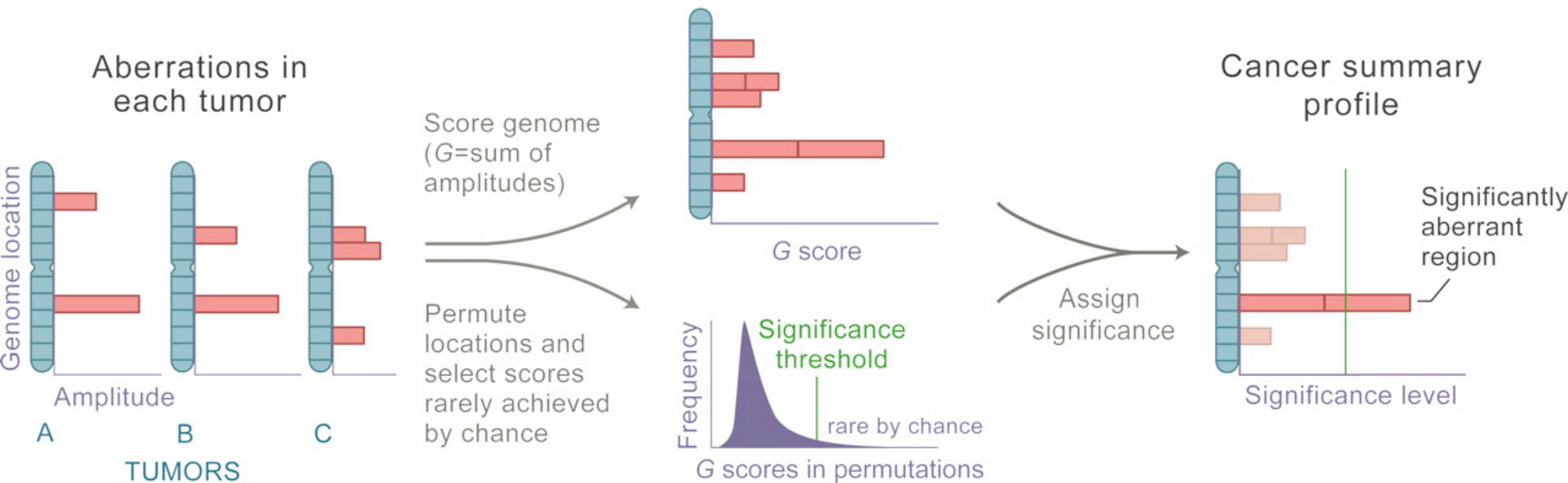
Question:
Which regions are frequently amplified or deleted in the genome?

Frequent CNAs - GISTIC

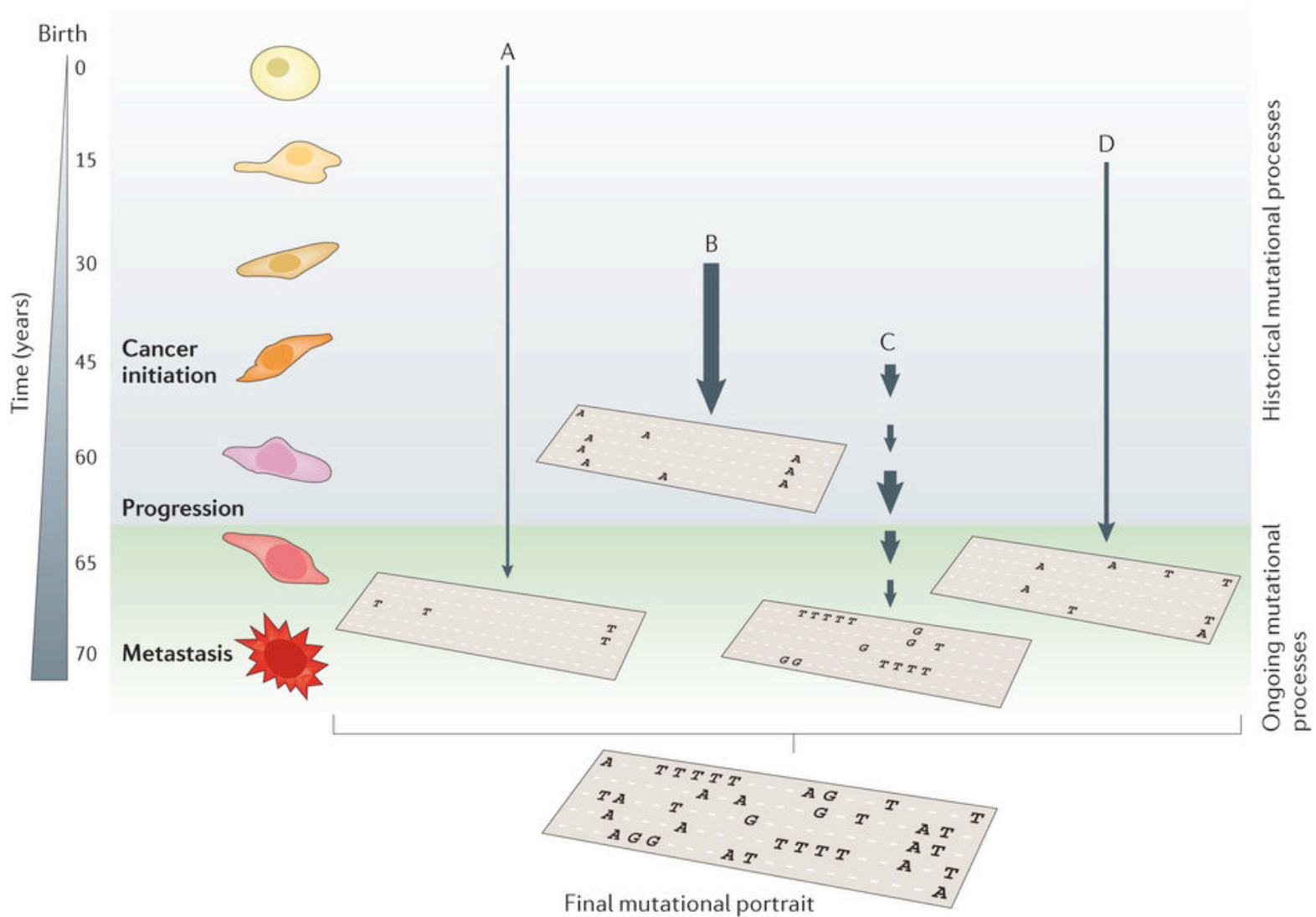


Mermel et al. (Genome Biology 2011)
Beroukhi et al. (PNAS 2007)

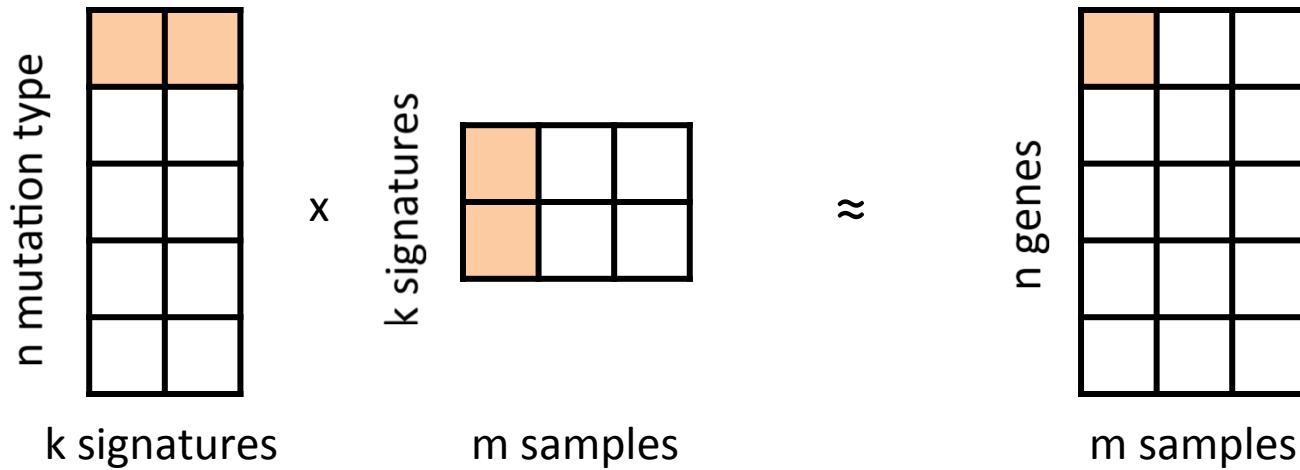
Frequent CNAs - GISTIC



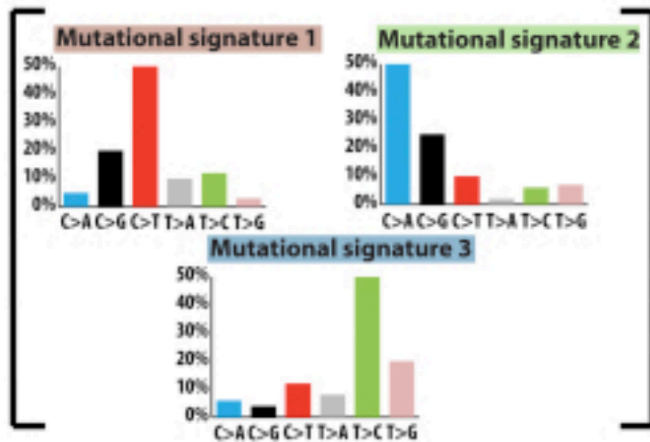
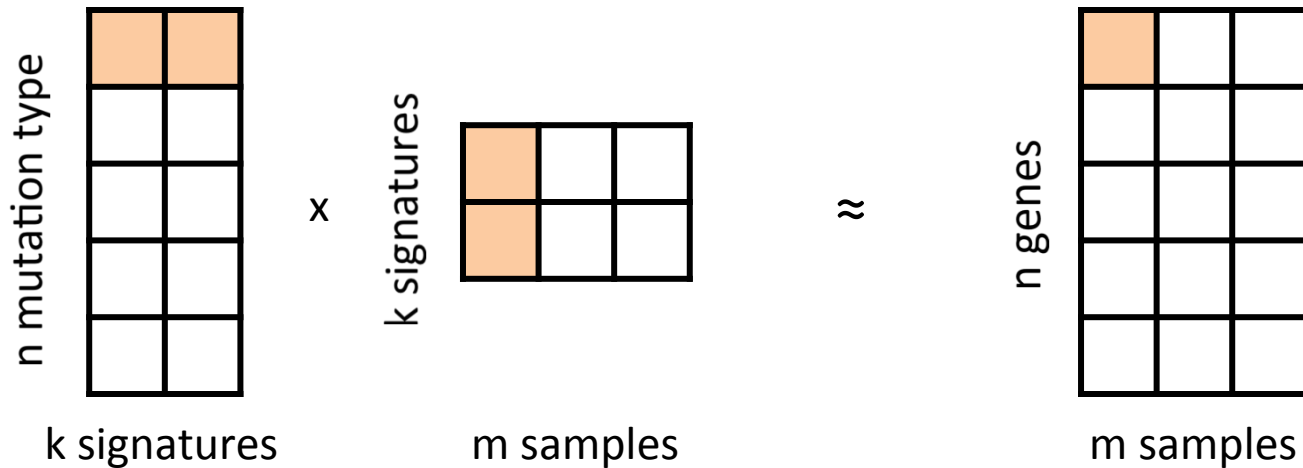
Mutational processes and the genome



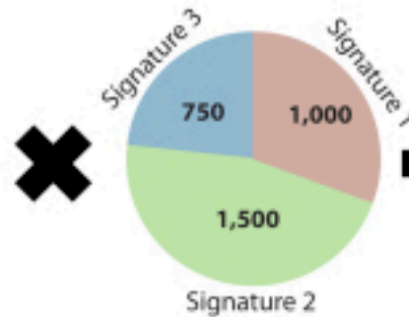
Non-negative matrix factorization



Non-negative matrix factorization



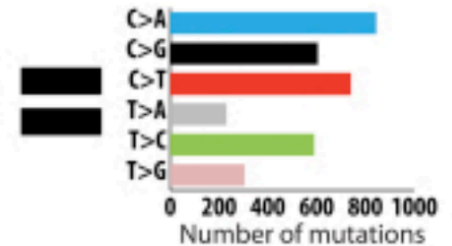
Signatures of mutational processes



Number of mutations contributed by each signature

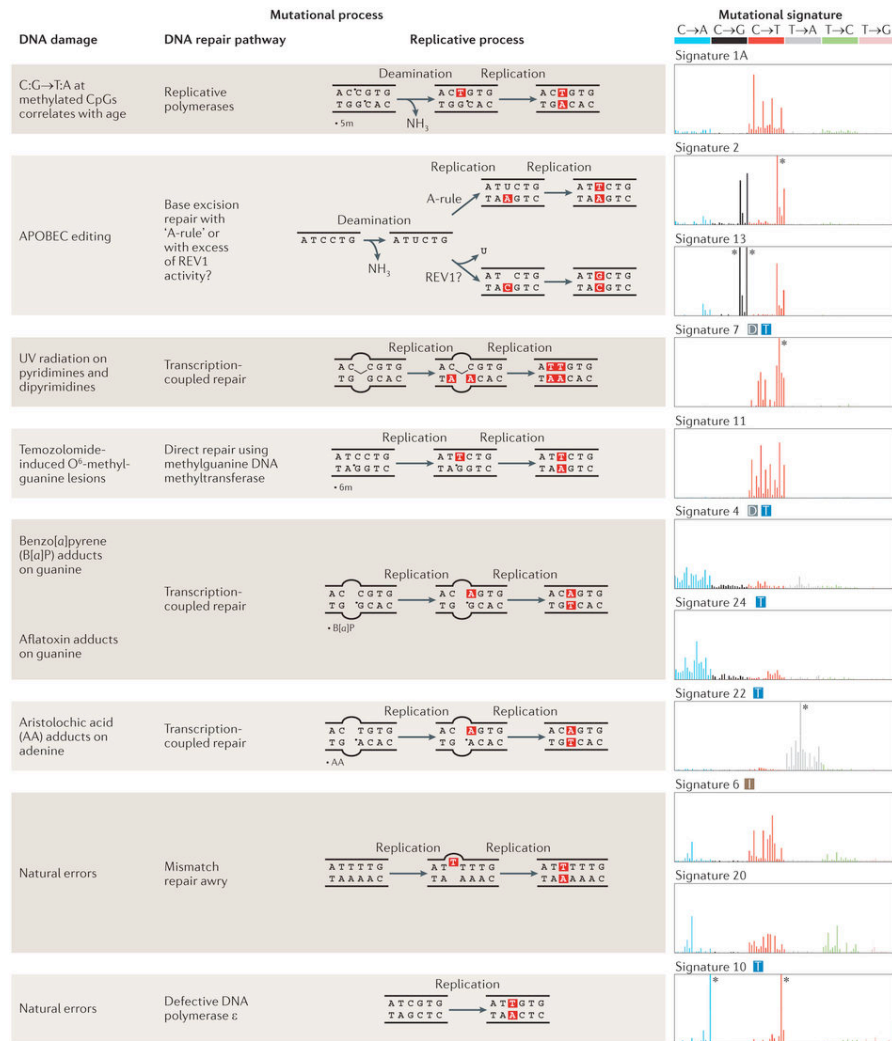


Non-systematic analysis errors



Mutational catalogue of a cancer genome

Some known mutational processes



Nature Reviews | Genetics

See also: <http://cancer.sanger.ac.uk/cosmic/signatures>