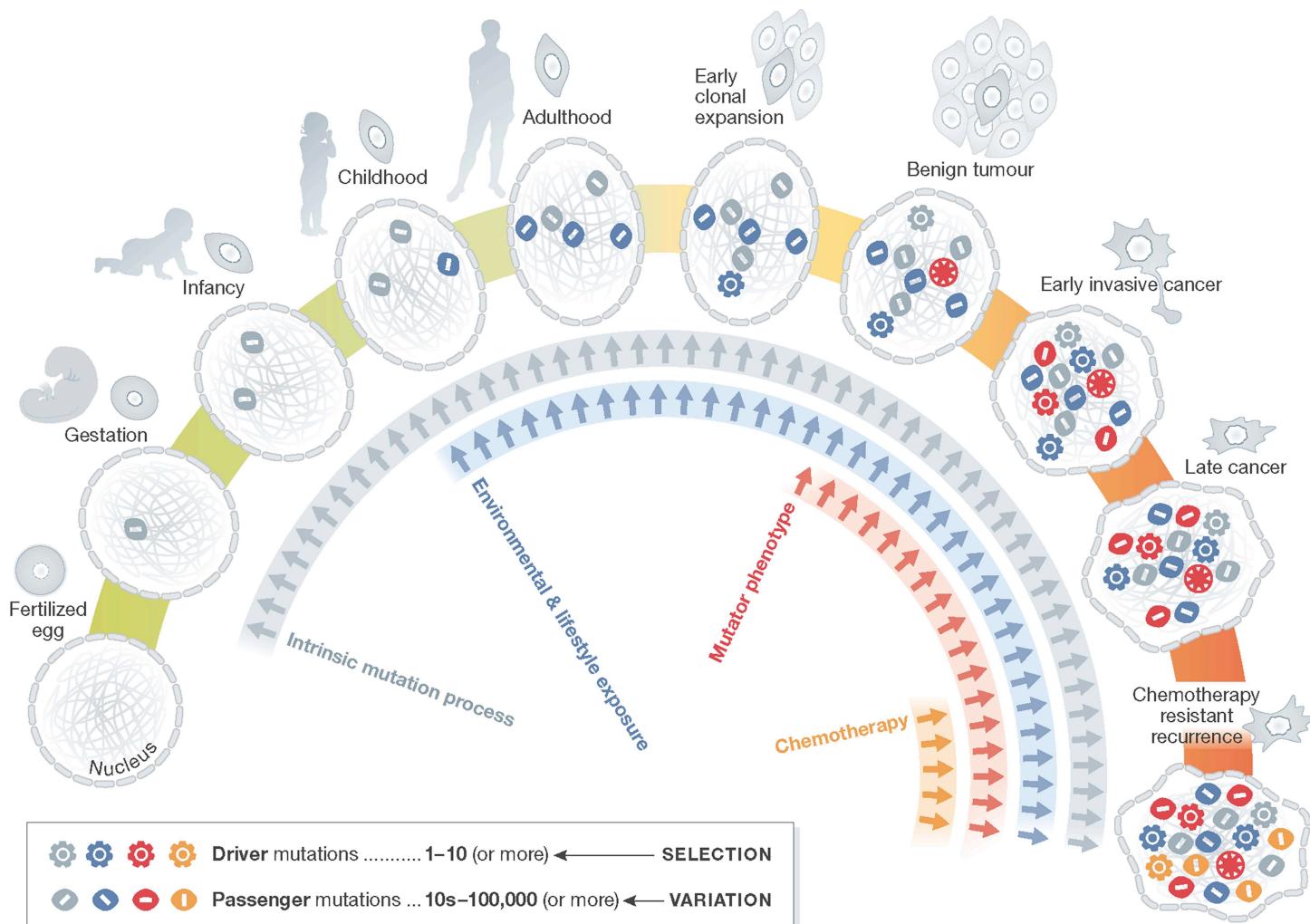


Mutational signature analysis

Introduction

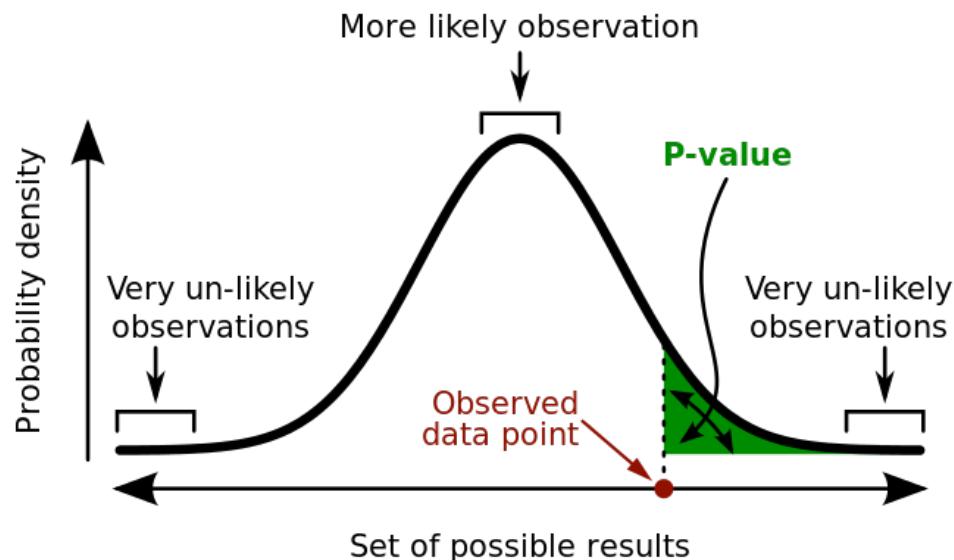
Cohort analysis



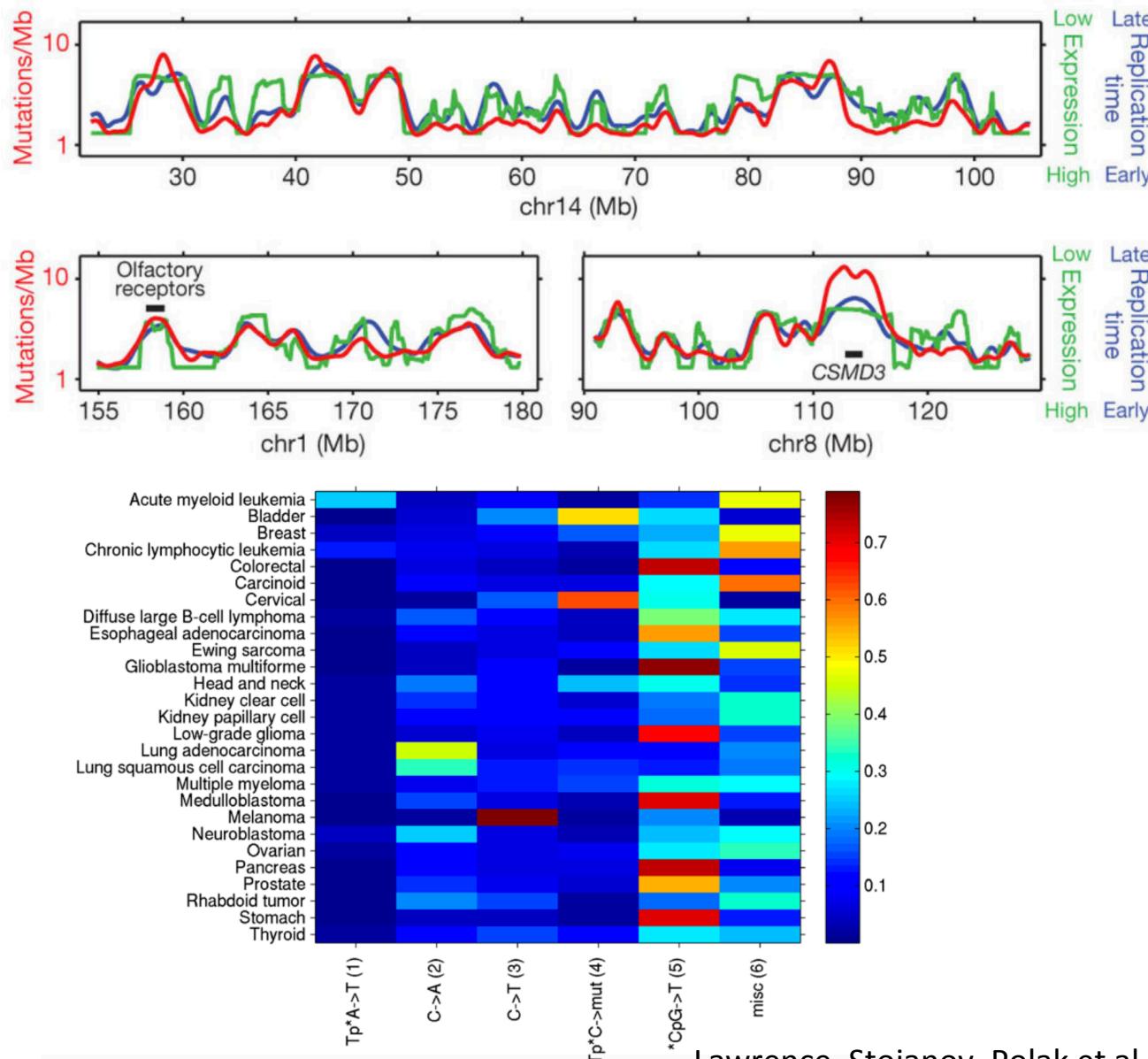
Stratton (EMBO Molecular Medicine 2013)

Frequently mutated genes - MutSigCV

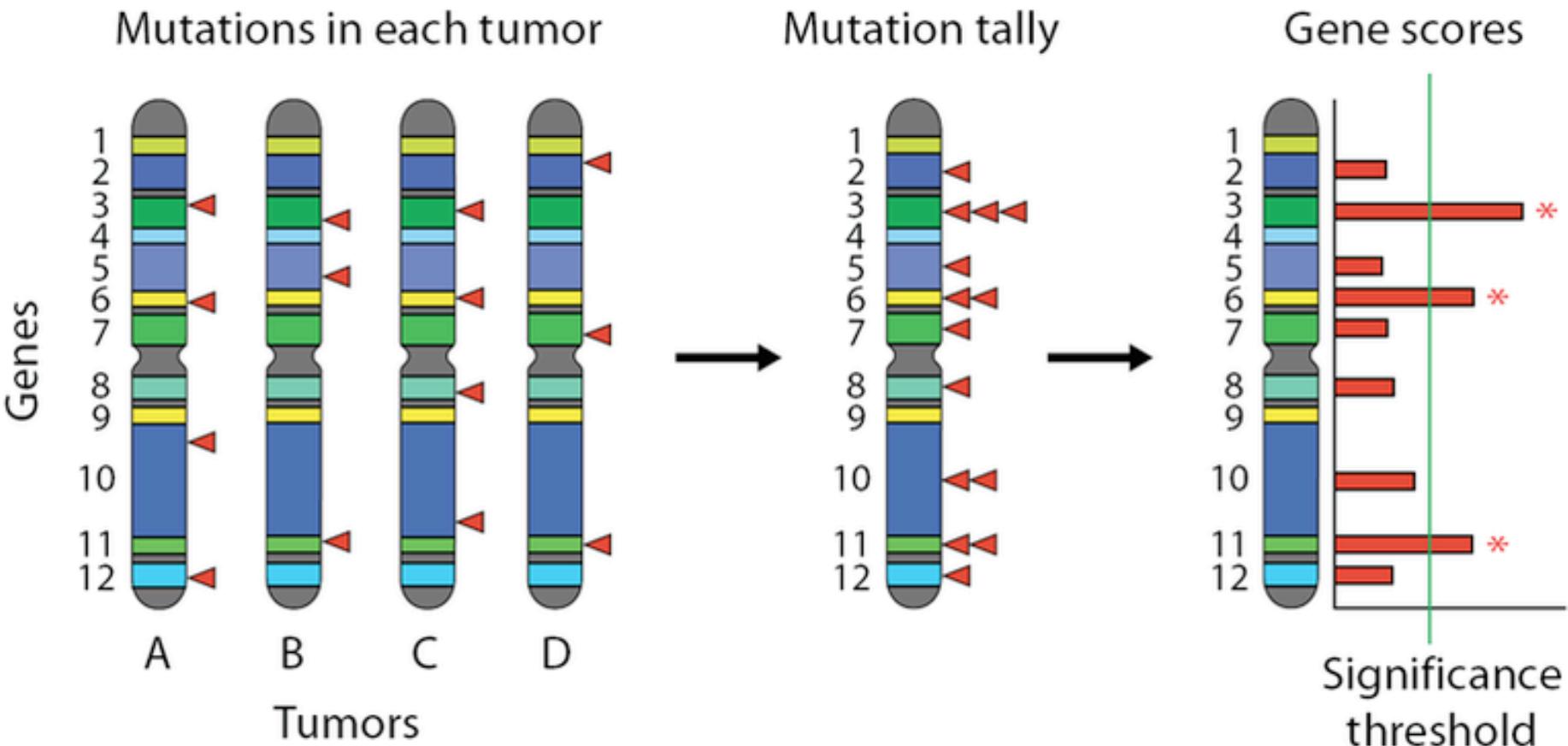
Question:
Which gene is hit by an SNV
more often than expected
in a cohort?



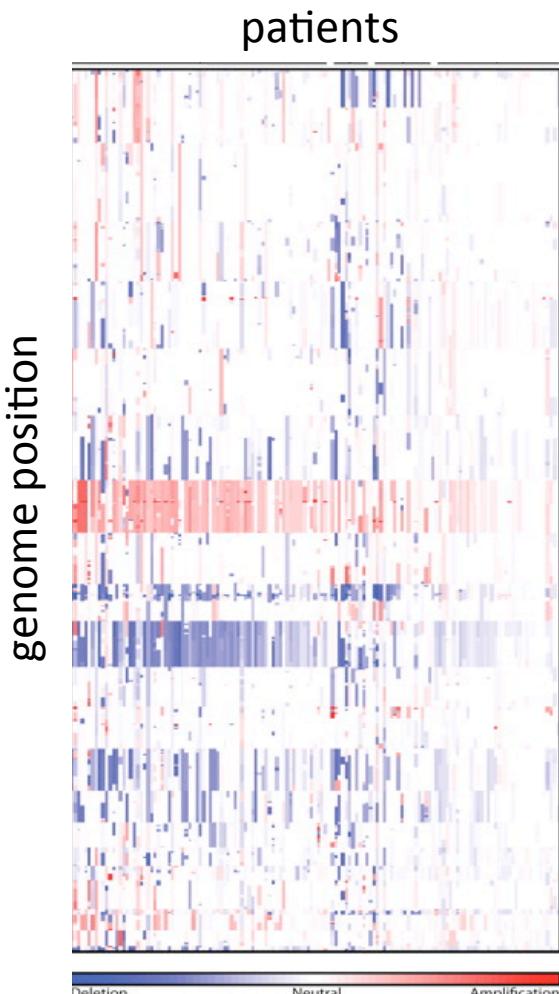
Characteristics of frequently mutated regions



Frequently mutated genes



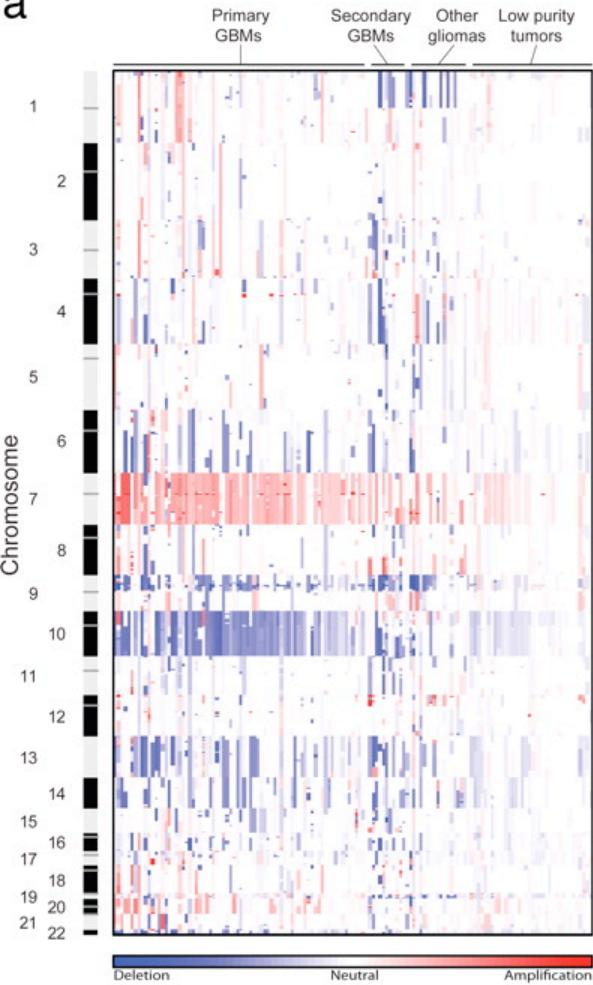
Frequent CNAs - GISTIC



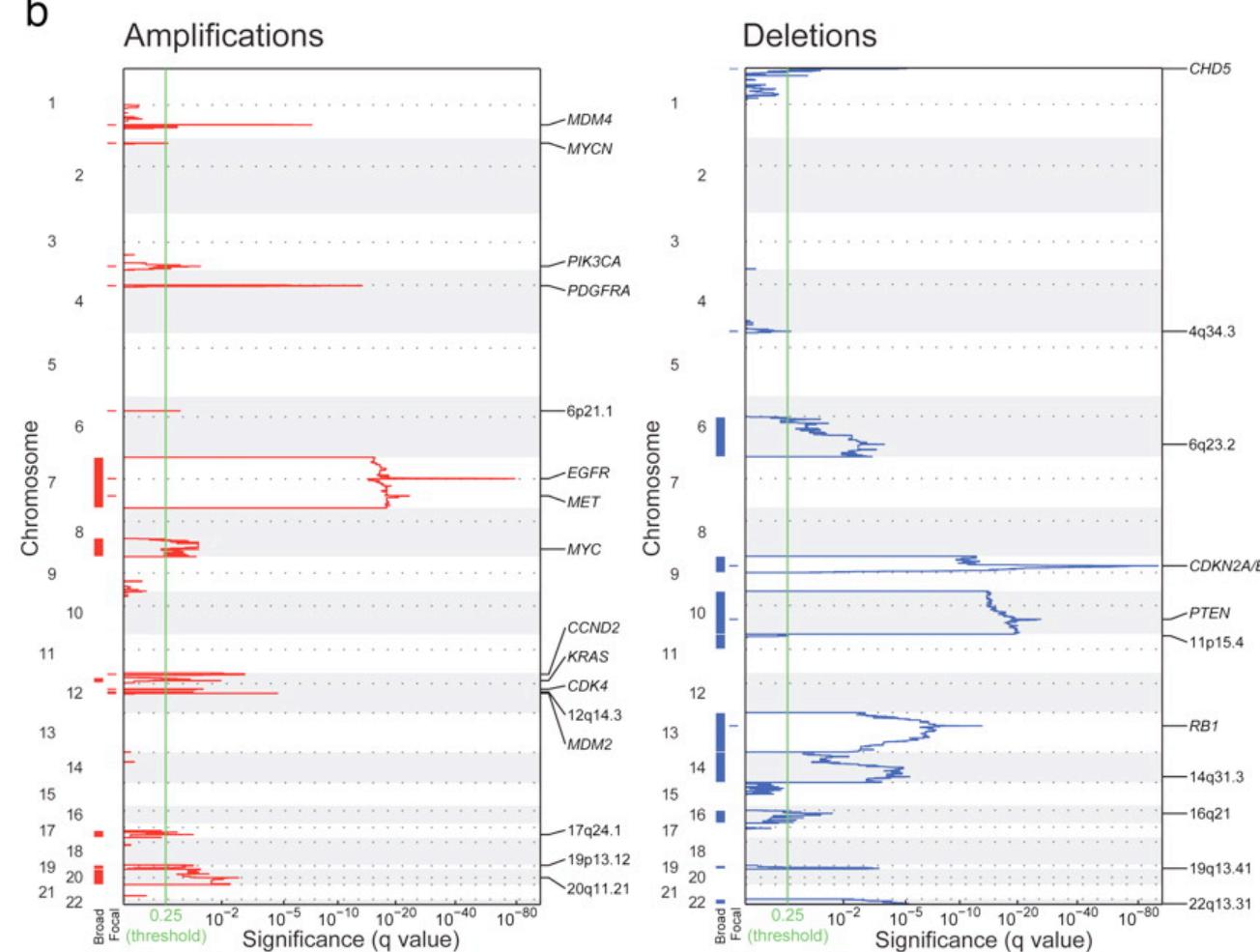
Question:
Which regions are
frequently amplified or
deleted in the genome?

Frequent CNAs - GISTIC

a

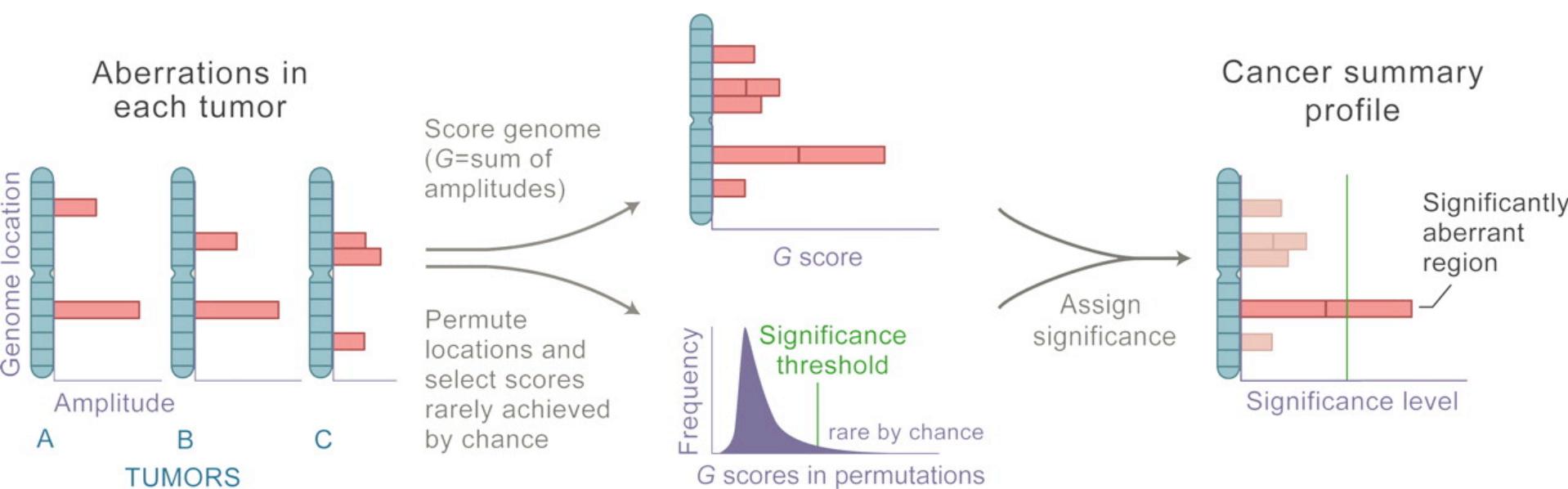


b

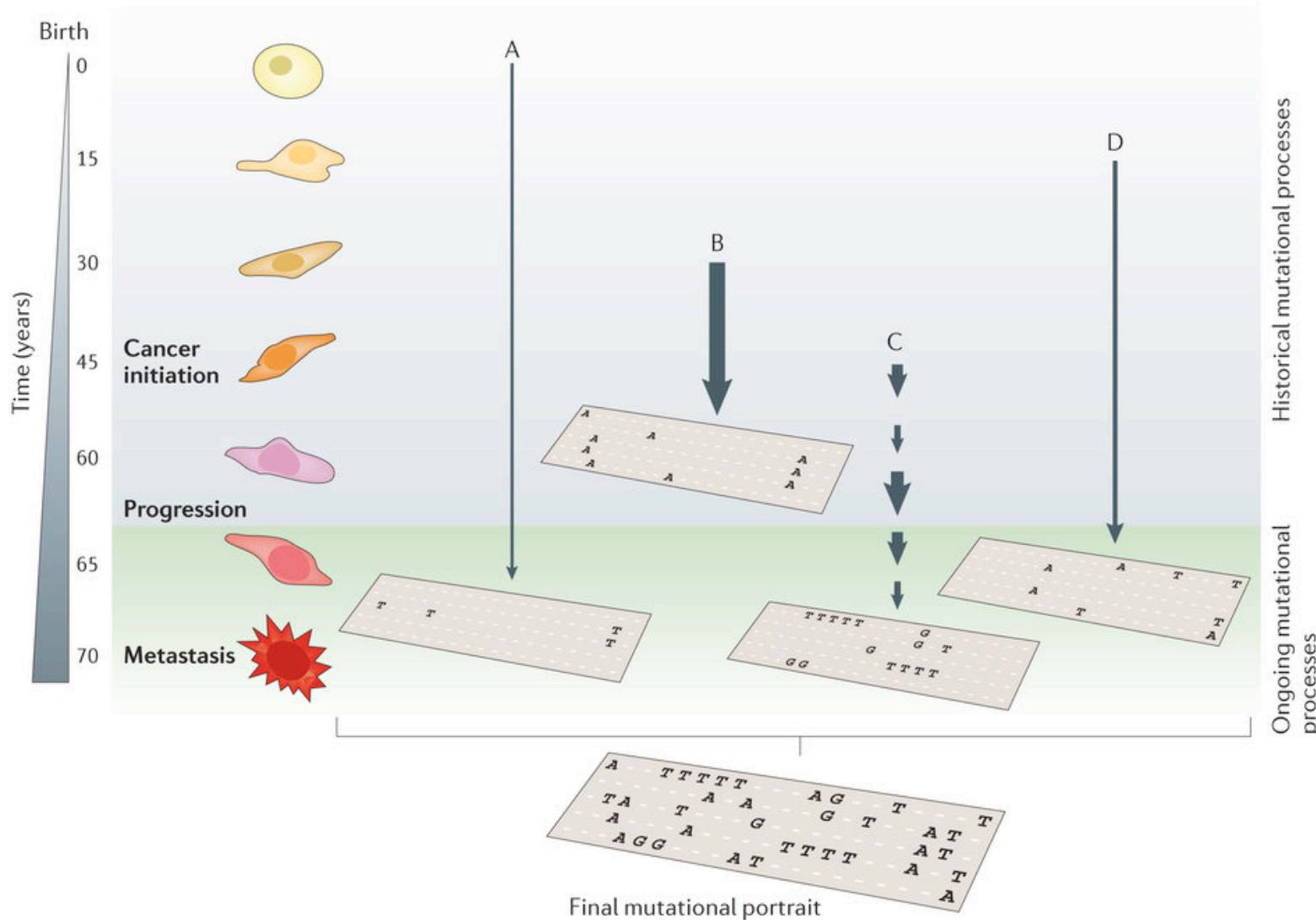


Mermel et al. (Genome Biology 2011)
Beroukhim et al. (PNAS 2007)

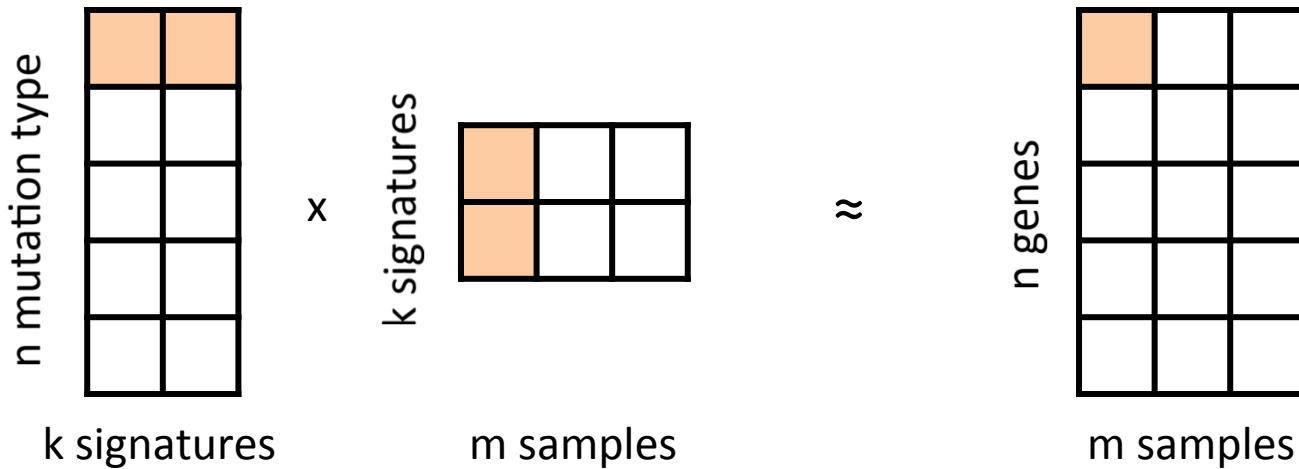
Frequent CNAs - GISTIC



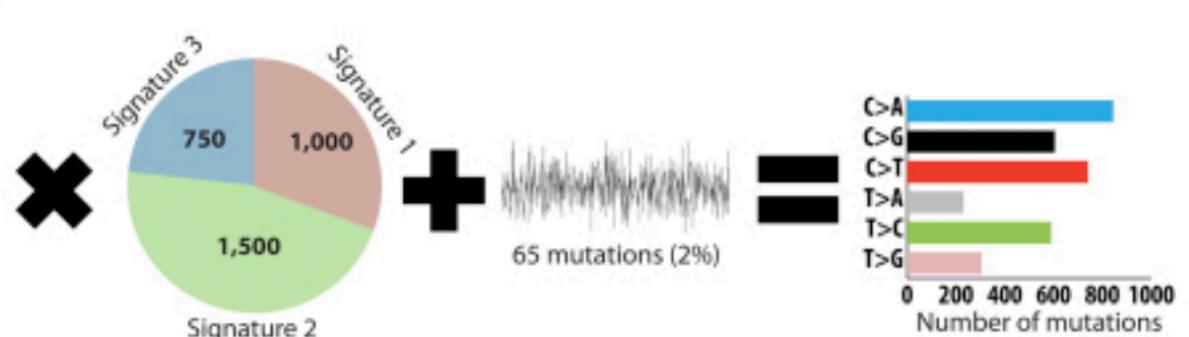
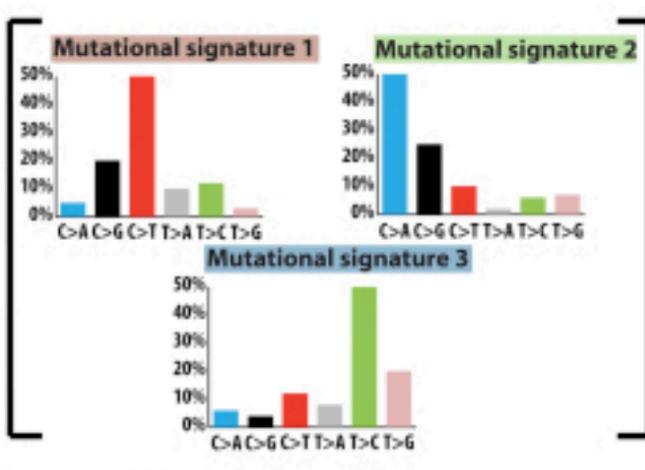
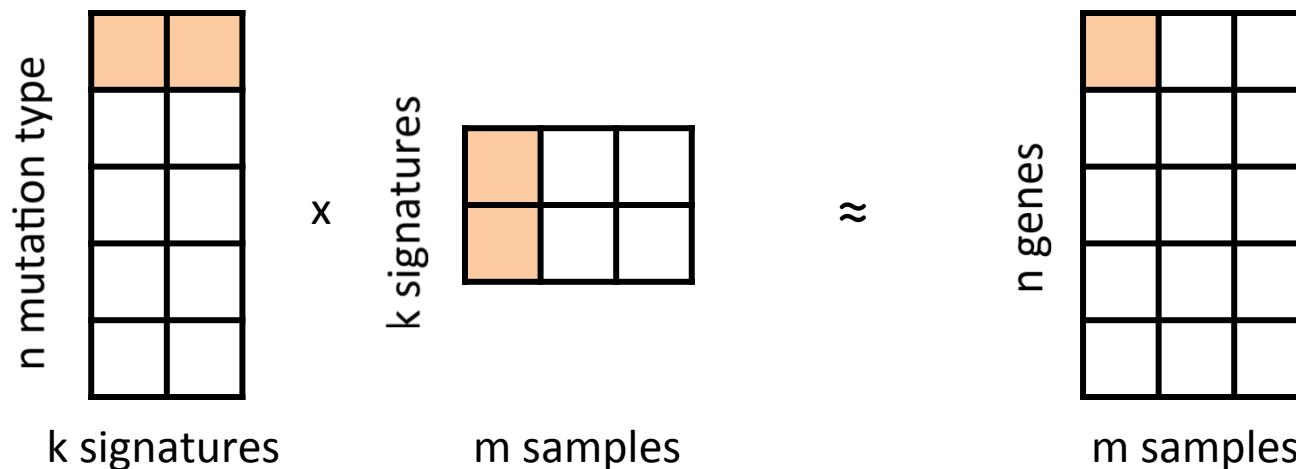
Mutational processes and the genome



Non-negative matrix factorization



Non-negative matrix factorization



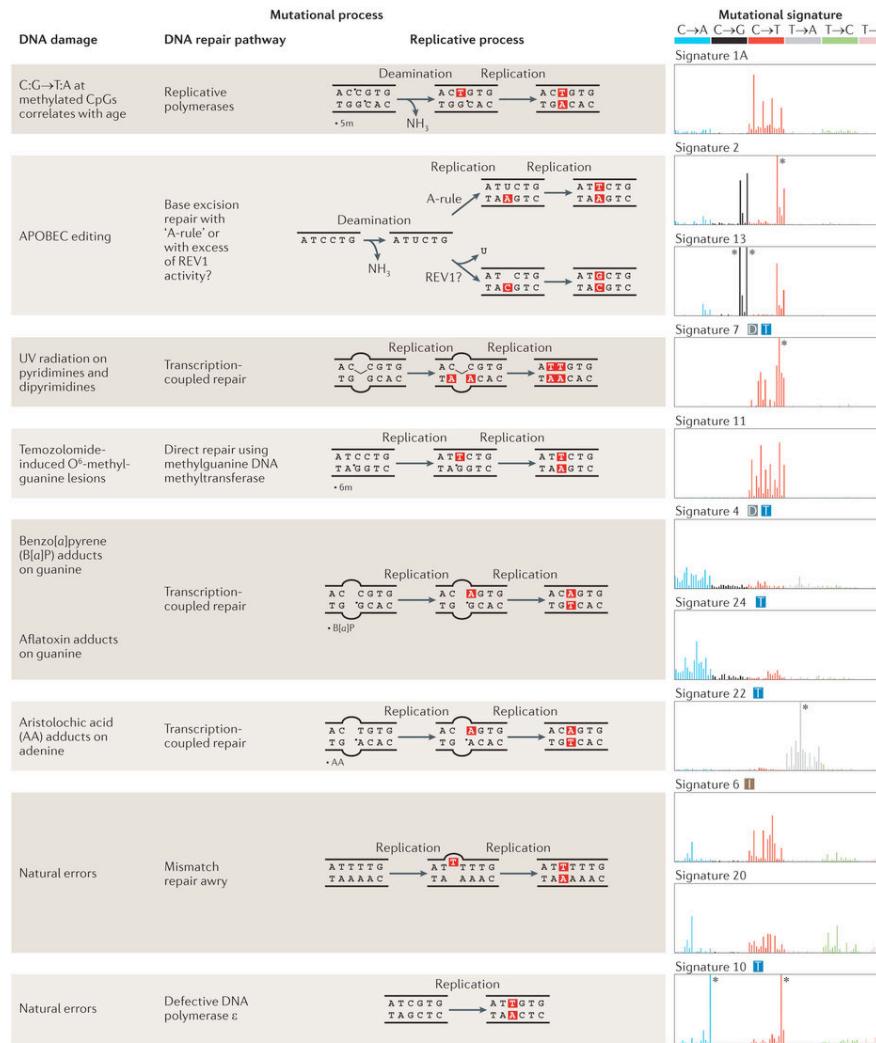
Signatures of mutational processes

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>