What is computational biology software?

Steven Salzberg

- Computational biology software
  - analysis of genomic data
  - visualization of results
  - statistical analysis

Raw data must be transformed

CGATCGACGATCGATCGATCGATCGATCGATCGATCGATGCATCGATCGATCGATC
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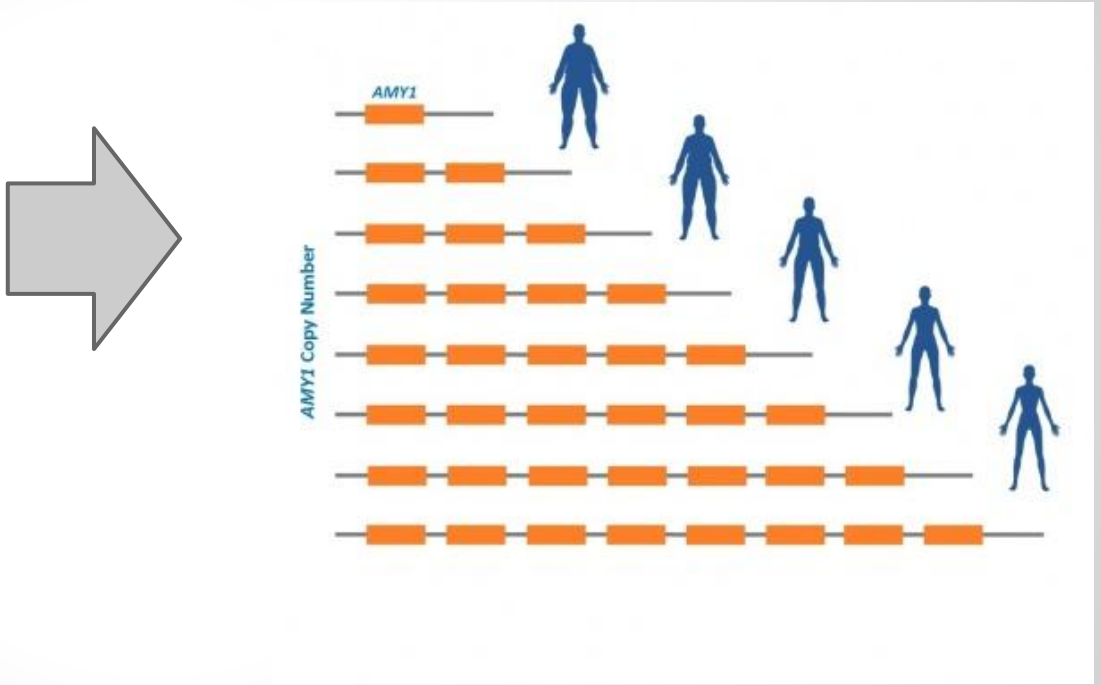
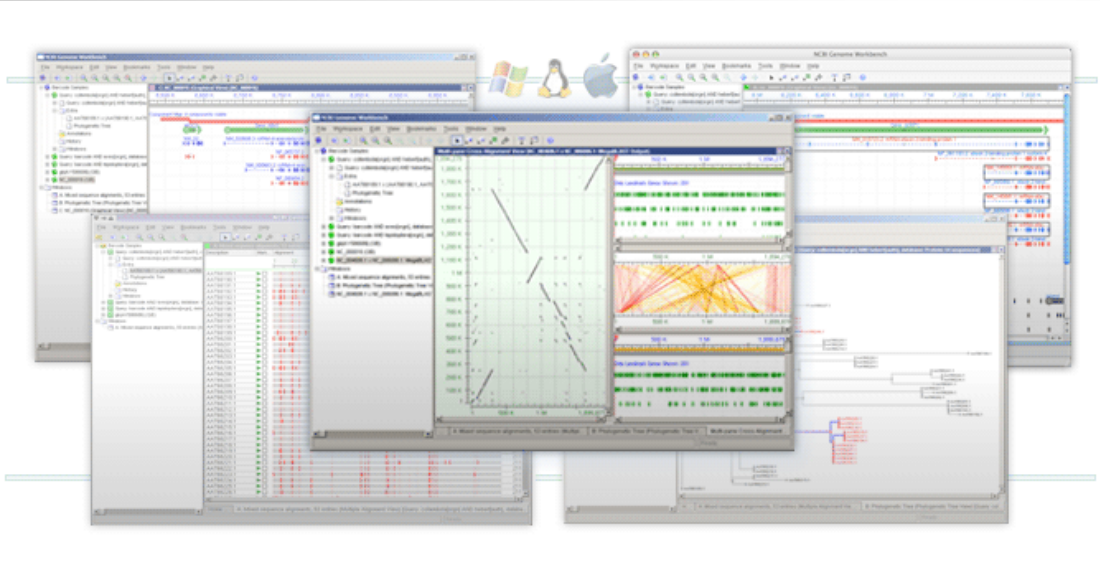


Analysis “pipelines”

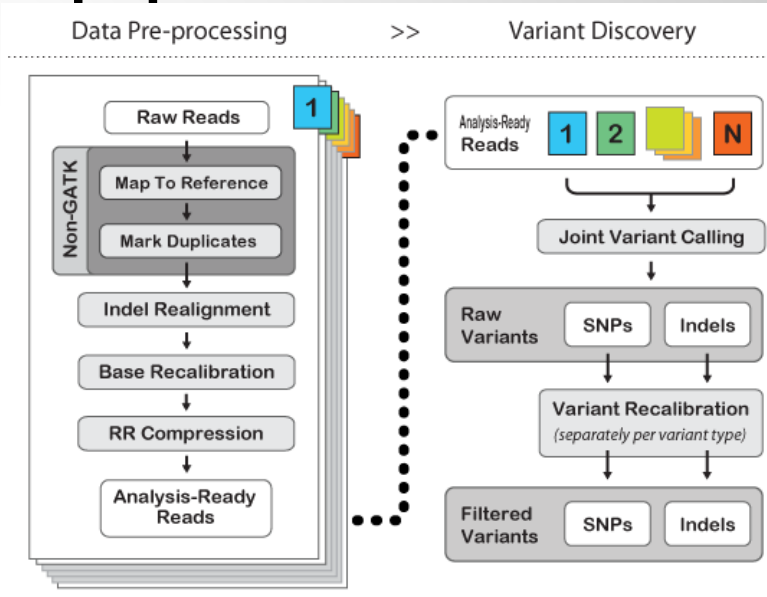
DNA

Brilliant insight

100s of programs and pipelines



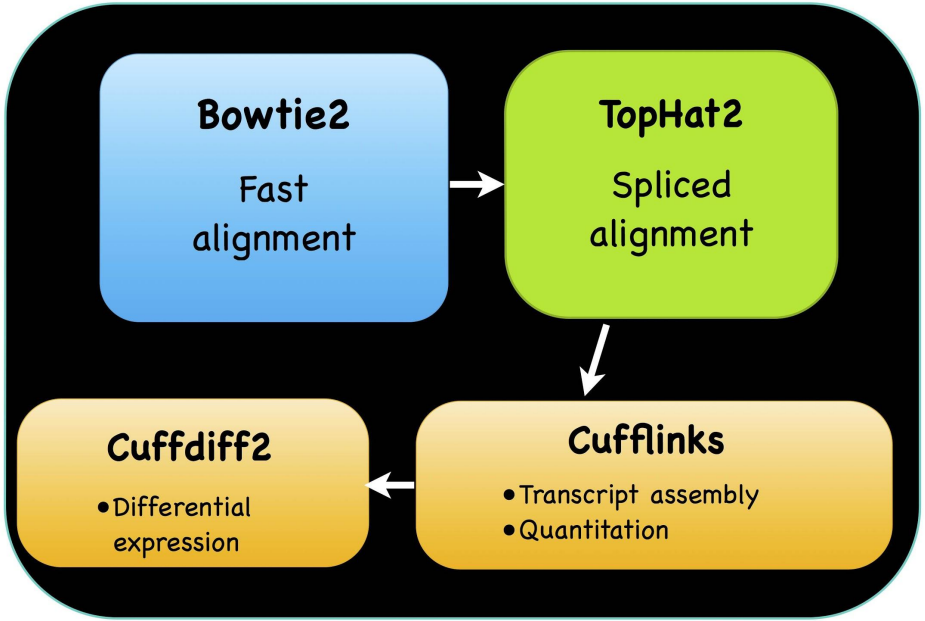
NCBI Genome Workbench



Genetic variant calling

An RNA-seq pipeline

the "Tuxedo" tools



Langmead et al. 2009; Langmead and Salzberg, 2012; Trapnell, Pachter, and Salzberg, 2009; Trapnell et al., 2010; Kim et al., 2013

Tuxedo turns reads into genes…

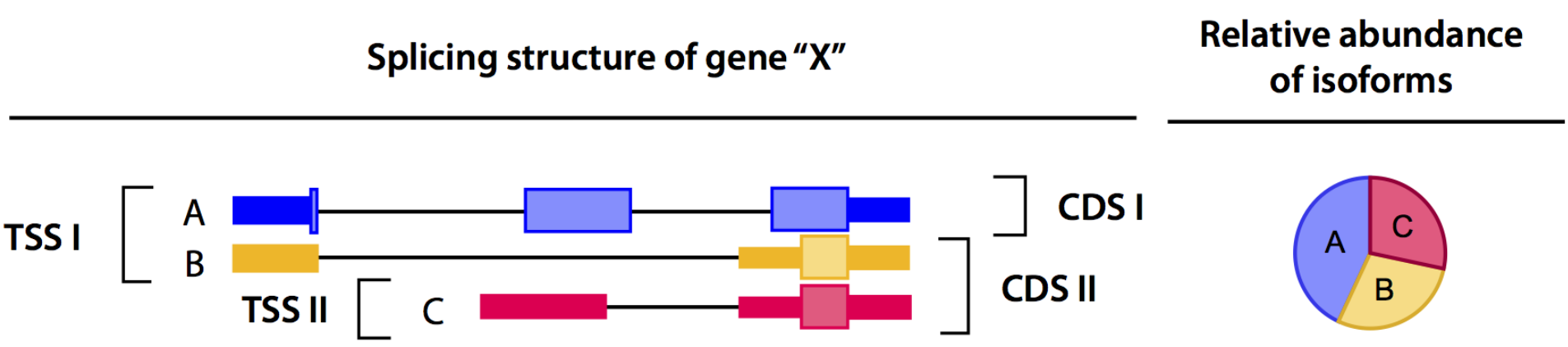
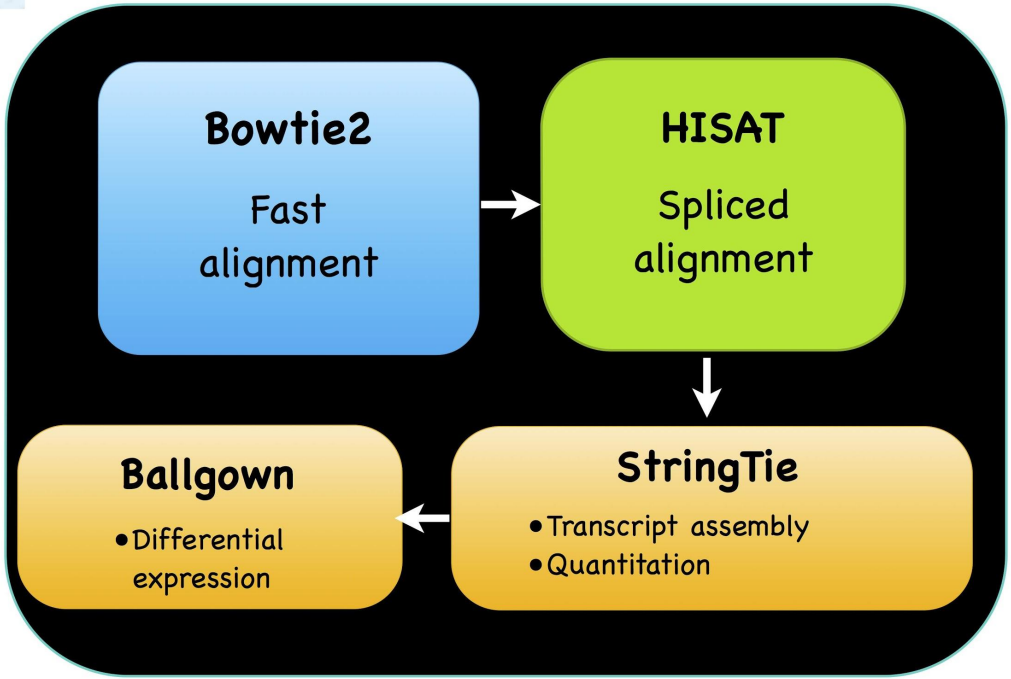


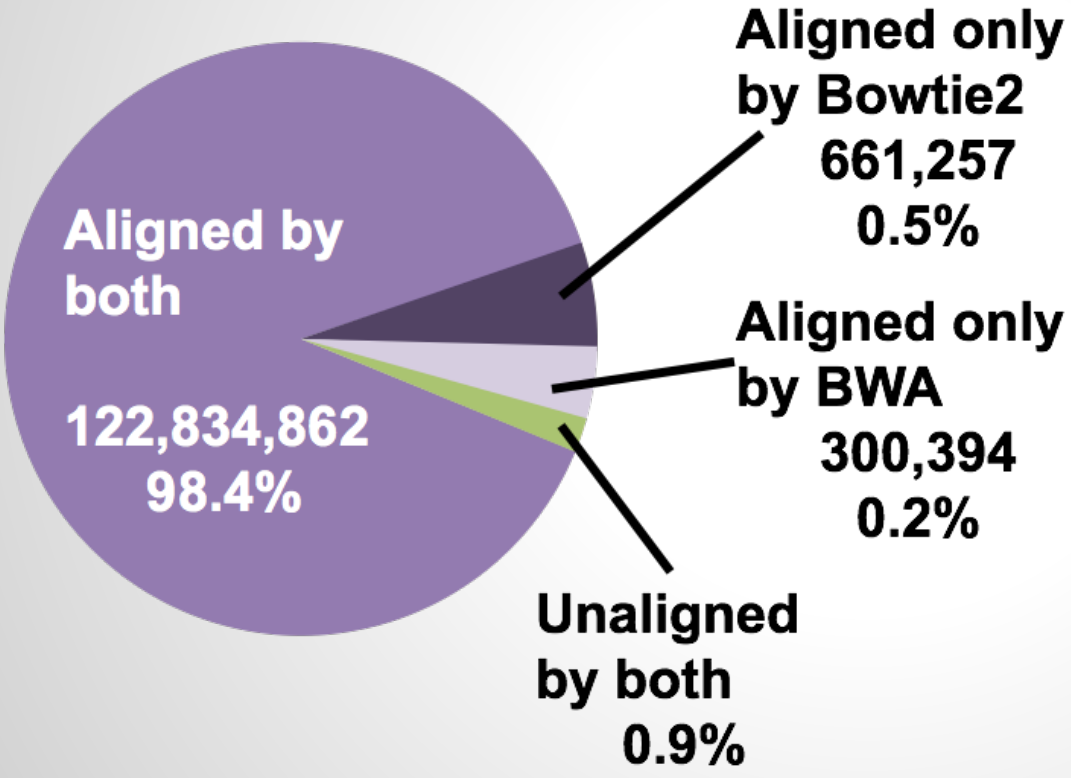
Figure from Trapnell et al (2012), *Nature Protocols* 7:3, 562

Pipelines change - keep up!

the next-generation
"Tuxedo" tools



Does software choice matter?



Fast-changing software

- Technology is changing
- Software must keep up
- So must we!