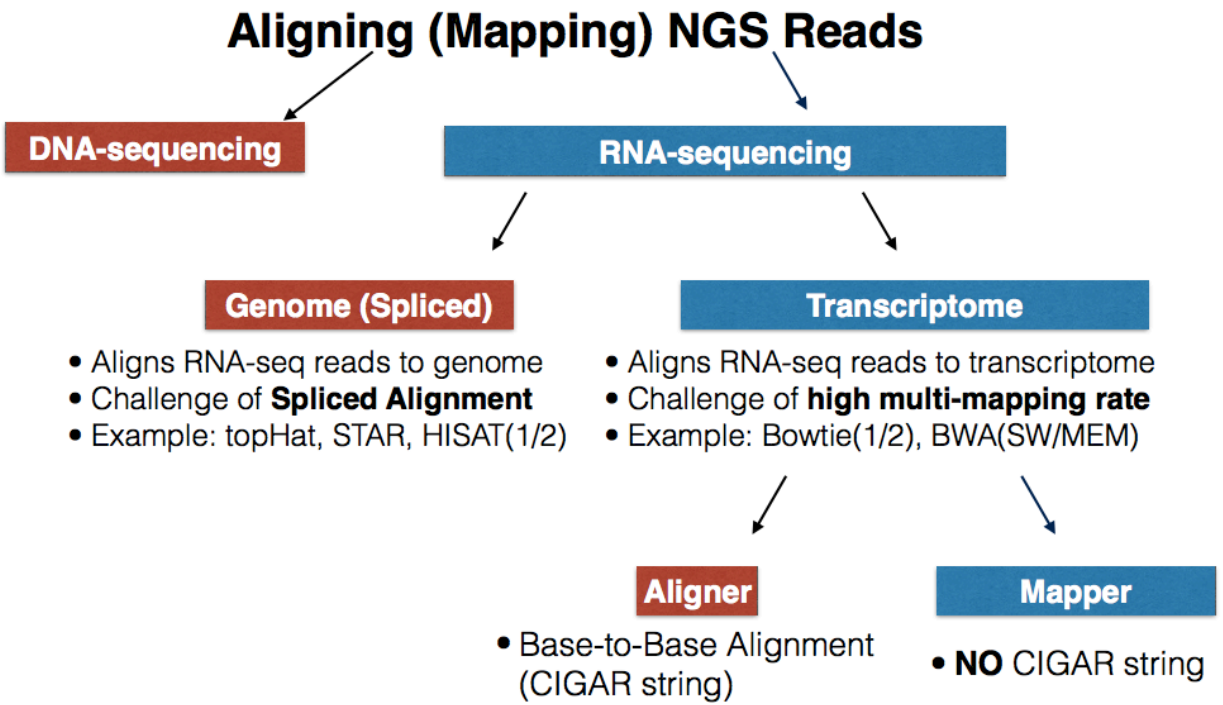
Mapping

Lecture 12
Sept 28, 2016

Announcements

- Article for Friday group

Which Mapper



Mapping

Format specification: http://samtools.github.io/hts-specs/SAMv1.pdf

Mapping - BWT

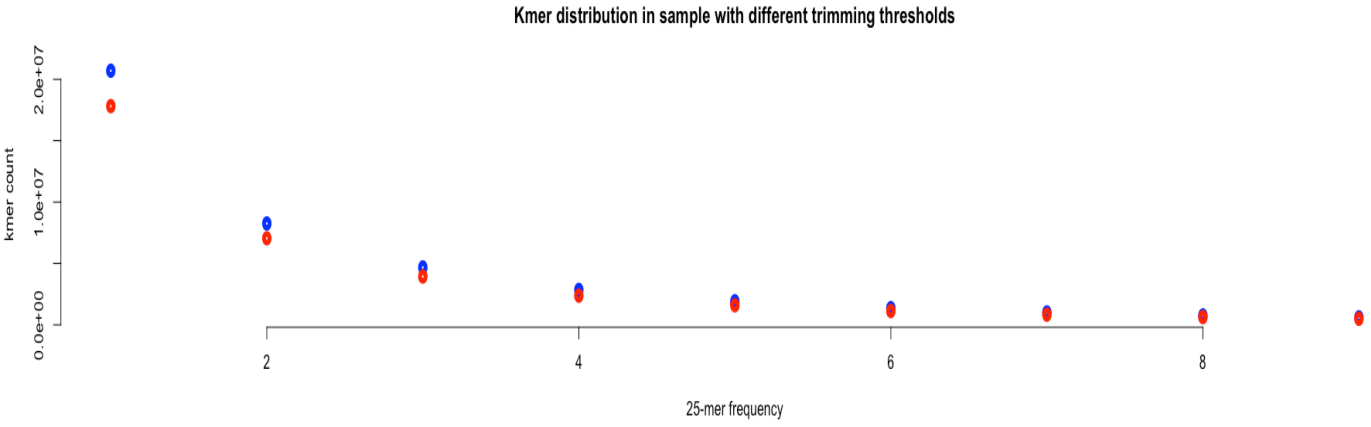
Alignment Fields

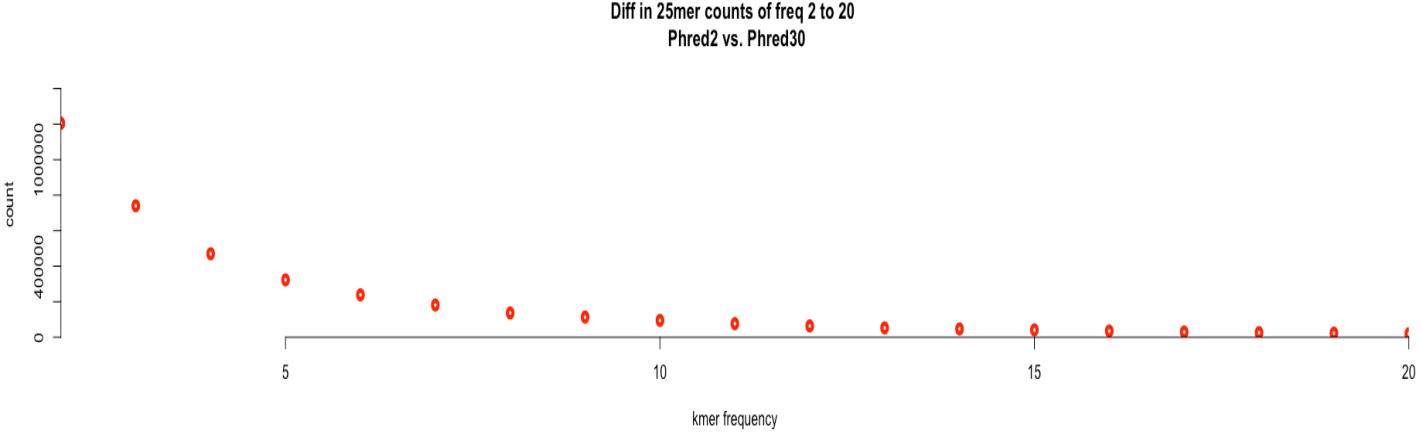
- Col1
- Col2
- Col3
- Col4
- Col5
- Col6
- Col7
- Col8
- Col9
- Col10
- Col11

Mapping - BWT

http://broadinstitute.github.io/picard/explain-flags.html

Brief intro to kmers





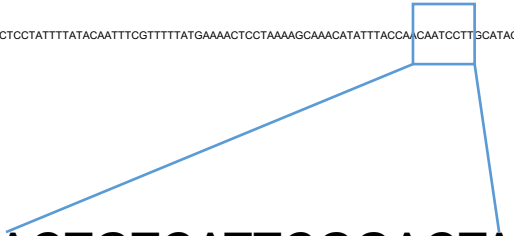
Brief intro to kmers

Read Error Correction

Error Correction

Error Correction

TATACAATTTCGTTTTTATGAAAACTCCTAAAAGCAAACATATTTACCAACAATCCTTGCATACGAAATAACCGATTCTATTTAAGCATTGCTCCTATTTTATACAATTTCGTTTTTATGAAAACTCCTAAAAGCAAACATATTTACCAACAATCCTTGCATACGAAATAACCGATTCTATTTAAGCATTGC

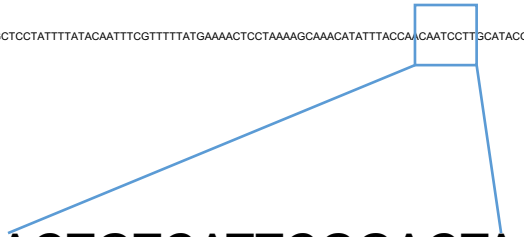


ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGCCTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGACATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA

Consensus= ACTGTCATTCGGACTA

Error Correction

TATACAATTTCGTTTTTATGAAAACTCCTAAAAGCAAACATATTTACCAACAATCCTTGCATACGAAATAACCGATTCTATTTAAGCATTGCTCCTATTTTATACAATTTCGTTTTTATGAAAACTCCTAAAAGCAAACATATTTACCAACAATCCTTGCATACGAAATAACCGATTCTATTTAAGCATTGC

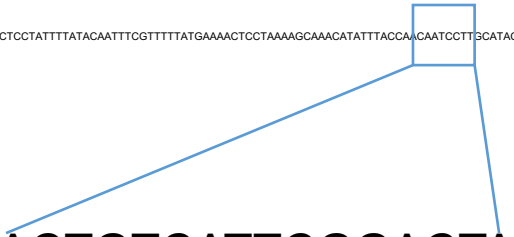


ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGCCTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGACATTCGGACTA
ACTGACATTCGGACTA
ACTGTCATTCGGACTA

Consensus= ACTG{A,T}CATTCGGACTA

Error Correction

TATACAATTTCGTTTTTATGAAAACTCCTAAAAGCAAACATATTTACCAACAATCCTTGCATACGAAATAACCGATTCTATTTAAGCATTGCTCCTATTTTATACAATTTCGTTTTTATGAAAACTCCTAAAAGCAAACATATTTACCAACAATCCTTGCATACGAAATAACCGATTCTATTTAAGCATTGC



ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGCCTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
ACTGTCATTCGGACTA
GCTGATAACCGGACTA
ACTGACATTCGGACTA
ACTGTCATTCGGACTA

Consensus= ACTGTCATTCGGACTA

Error Correction

Hamming Distance:
http://en.wikipedia.org/wiki/Hamming_distance

Error Correction

3 different strategies

Error Correction

Kmer-spectra based

Error Correction

MSA based

Error Correction

Evaluation of Correction