# fastp report

## Summary

#### General

| fastp version:                | 0.23.2 (https://github.com/OpenGene/fastp) |
|-------------------------------|--|
| sequencing:                   | paired end (101 cycles + 101 cycles)       |
| mean length before filtering: | 101bp, 101bp                               |
| mean length after filtering:  | 100bp, 100bp                               |
| duplication rate:             | 0.492627%                                  |
| Insert size peak:             | 171  |

#### Before filtering

| total reads: | 67.671844 M             |
|--------------|-------------------------|
| total bases: | 6.834856 G              |
| Q20 bases:   | 6.212100 G (90.888522%) |
| Q30 bases:   | 5.657187 G (82.769655%) |
| GC content:  | 45.621445%              |

#### After filtering

| total reads: | 60.743926 M             |
|--------------|-------------------------|
| total bases: | 6.103671 G              |
| Q20 bases:   | 5.795487 G (94.950852%) |
| Q30 bases:   | 5.333758 G (87.386072%) |
| GC content:  | 45.052993%              |

#### Filtering result

| reads passed filters:   | 60.743926 M (89.762481%) |
|-------------------------|--------------------------|
| reads with low quality: | 6.895254 M (10.189251%)  |
| reads with too many N:  | 32.664000 K (0.048268%)  |
| reads too short:        | 0 (0.000000%)            |

## Adapters

#### Adapter or bad ligation of read1

The input has little adapter percentage (~0.467199%), probably it's trimmed before.

| Sequence              | Occurrences |
|-----------------------|-------------|
| all adapter sequences | 410428      |

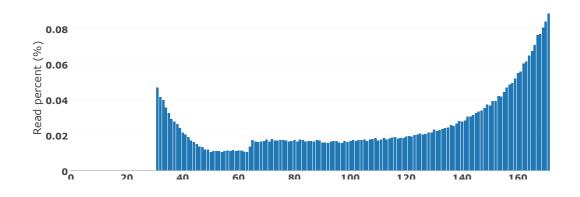
### Adapter or bad ligation of read2

The input has little adapter percentage (~0.467199%), probably it's trimmed before.

| Sequence              | Occurrences |
|-----------------------|-------------|
| all adapter sequences | 410428      |

## Insert size estimation

Insert size distribution (96.407660% reads are with unknown length)

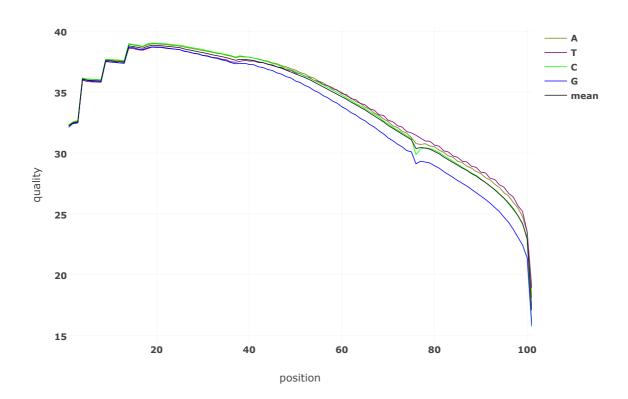


This estimation is based on paired-end overlap analysis, and there are 96.407660% reads found not overlapped. The nonoverlapped read pairs may have insert size <30 or >172, or contain too much sequencing errors to be detected as overlapped.

#### Before filtering

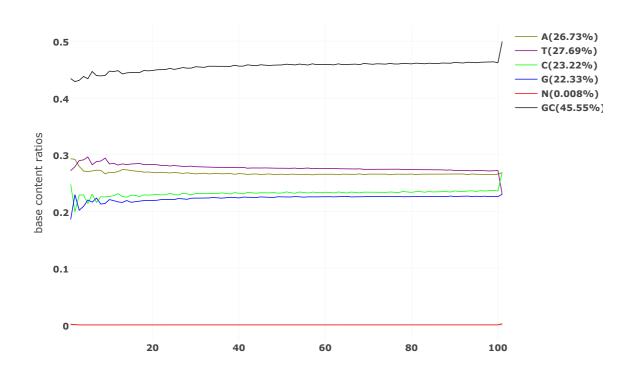
#### Before filtering: read1: quality

Value of each position will be shown on mouse over.



#### Before filtering: read1: base contents

Value of each position will be shown on mouse over.



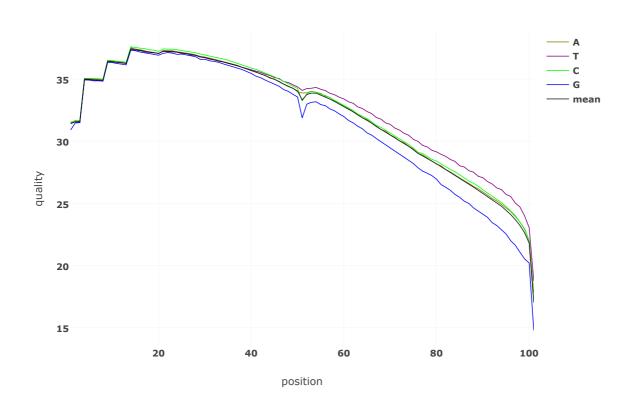
## Before filtering: read1: KMER counting

Darker background means larger counts. The count will be shown on mouse over.

| AA AT AC ACC TO CO CO GA CT CO CO CASCARDATE AND ADDRESS AND ADDRE | 2021 | 101 200 |       | mound | rarger | 0041100 |       |       |       |       |       |       |       |        |       |       |       |
|--|------|---------|-------|-------|--------|---------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| AAT AL ANDRE ARTE ARTE ARTE ARTE ARTE ARTE ARTE AR   |      | AA      | AT    | AC    | AG     | TA      | TT    | TC    | TG    | CA    | CT    | CC    | CG    | GA     | GT    | GC    | GG    |
| AACA ANABA ANABAT AACA ANABA ANABAT AACT AACT AACT AACT AACT AACT AACT   | AAA  | AAAAA   | AAAAT | AAAAC | AAAAG  | AAATA   | AAATT | AAATC | AAATG | AAACA | AAACT | AAACC | AAACG | AAAGA  | AAAGT | AAAGC | AAAGG |
| AACA ANABA ANABAT AACA ANABA ANABAT AACT AACT AACT AACT AACT AACT AACT   | AAT  | ААТАА   | AATAT | AATAC | AATAG  | APTTA   | AATTT | AATTC | AATTG | AATCA | AATCT | AATCC | AATCG | AATGA  | AATGT | AATGC | AATGG |
| ANGAL ANGAL AMART AREA AREA AREA AREA AREA AREA AREA A   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| ATAMA NYANT ATTAC ATTACK ATTAC |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| ATT ATTACK ATTAC |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| ATCL ATCLAS ATCLAS ATCLAS ATCLAS ATCLAS ATCTAS ATCT |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| APOLA PARAM ATEMAT APPEAR CHIEF AND ATTEM ATTEM ATTEM ATEMATIC ATE | ATT  | ATTAA   |       | ATTAC |        |         |       | ATTTC |       |       | ATTCT | ATTCC | ATTCG |        |       |       | ATTGG |
| ACADA ACADA ACADA ACADA ACATA  | ATC  |         |       | ATCAC |        | ATCTA   | ATCTT | ATCTC | ATCTG | ATCCA |       | ATCCC | ATCCG | ATCGA  | ATCGT | ATCGC | ATCGG |
| ACADA ACADA ACADA ACADA ACATA  | ATG  | ATGAA   | ATGAT | ATGAC | ATGAG  | ATGTA   | ATGTT | ATGTC | ATGTG | ATGCA | ATGCT | ATGCC | ATGCG | ATGGA  | ATGGT | ATGGC | ATGGG |
| ACCI, ACCIA, ACC |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| ACCA ACCAA ACCAR ACCAR ACCAR ACCAR ACCTA A |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| ACCIDA   A   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| AGADA   AGAD   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| ACTION   A   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| AGC    | AGA  |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| AGGS      | AGT  |         |       | AGTAC |        | AGTTA   | AGTTT | AGTTC | AGTTG | AGTCA |       | AGTCC | AGTCG | AGTGA  | AGTGT | AGTGC | AGTGG |
| AGGA   AGGAC   | AGC  | AGCAA   | AGCAT | AGCAC | AGCAG  | AGCTA   | AGCTT | AGCTC | AGCTG | AGCCA | AGCCT | AGCCC | AGCCG | AGCGA  | AGCGT | AGCGC | AGCGG |
| TAAL   TAALA   TAALA   TAALA   TAALA   TAALA   TAALA   TAALT   TAATE   TAALA   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TART   TARTAR  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TACAMA   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TABLE   TABL   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TTA  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TITC   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TICAL  | TTA  | TTAAA   | TTAAT | TTAAC | TTAAG  | TTATA   | TTATT | TTATC | TTATG | TTACA | TTACT | TTACC | TTACG | TTAGA  | TTAGT | TTAGC | TTAGG |
| THO  | TTT  | TTTAA   | TTTAT | TTTAC | TTTAG  | TTTTA   | TTTTT | TTTTC | TTTTG | TTTCA | TTTCT | TTTCC | TTTCG | TTTGA  | TTTGT | TTTGC | TTTGG |
| TIGAL  | TTC  |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TOT. TICHAR TICHAT TORNE |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TOT   TOTAL    |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TOC  |      |         |       |       |        | _       |       |       |       |       |       |       |       |        |       |       |       |
| TOGA   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TOA,   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| TOTAL   TOTALA   CARATA   CA   | TCG  | TCGAA   | TCGAT | TCGAC | TCGAG  | TCGTA   | TCGTT | TCGTC | TCGTG | TCGCA | TCGCT | TCGCC | TCGCG | TCGGA  | TCGGT | TCGGC | TCGGG |
| Tech   | TGA  | TGAAA   | TGAAT | TGAAC | TGAAG  | TGATA   | TGATT | TGATC | TGATG | TGACA | TGACT | TGACC | TGACG | TGAGA  | TGAGT | TGAGC | TGAGG |
| Tech   | TGT  | TGTAA   | TGTAT | TGTAC | TGTAG  | TGTTA   | TGTTT | TGTTC | TGTTG | TGTCA | TGTCT | TGTCC | TGTCG | TGTGA  | TGTGT | TGTGC | TGTGG |
| TOGA   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CAA  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CATTA  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CAC   CACAA   CACAT   CACAC   CACAC   CACAC   CACAT   CACAT   CACAT   CACAC   CACAC   CACAC   CACCC   CACAC   CACAG    | 0.00 |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CAGA   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CTA  | CAC  |         |       |       |        | CACTA   |       |       |       |       |       | CACCC |       |        |       |       | CACGG |
| CTTA   | CAG  | CAGAA   | CAGAT | CAGAC | CAGAG  | CAGTA   | CAGTT | CAGTC | CAGTG | CAGCA | CAGCT | CAGCC | CAGCG | CAGGA  | CAGGT | CAGGC | CAGGG |
| CTC   CTCAA   CTCAT   CTCAC   CTCAC   CTCAC   CTCTA   CTCTT   CTCTC   CTCCAC   CTC   | CTA  | CTAAA   | CTAAT | CTAAC | CTAAG  | CTATA   | CTATT | CTATC | CTATG | CTACA | CTACT | CTACC | CTACG | CTAGA  | CTAGT | CTAGC | CTAGG |
| CTC   CTCAA   CTCAT   CTCAC   CTCAC   CTCAC   CTCTA   CTCTT   CTCTC   CTCCAC   CTC   | CTT  | CTTAA   | CTTAT | CTTAC | CTTAG  | CTTTA   | CTTTT | CTTTC | CTTTG | CTTCA | CTTCT | CTTCC | CTTCG | CTTGA  | CTTGT | CTTGC | CTTGG |
| CTG CTGAA CCTGAT CCACA C |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CCA  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CCT CCTAA CCTAT CCTAC CCTAC CCTAC CCTAC CCTAC CCTAC CCTTA CCTTC CCTCC CCTCA CCTCC CCTCA CCTCC CCTCA CCTCC CCCCA CCCCTA CCCCCA CCCCTA CCCCCA CCCCTA CCCCCA CCCCTA CCCCCA CCCCA CCCCCA CCC |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CCC  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CCC  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CGA CGAAA CGAAC CGACC CGCAC C  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| CGA CGAAA CGAAC CGACC CGCAC C  | CCG  | CCGAA   | CCGAT | CCGAC | CCGAG  | CCGTA   | CCGTT | CCGTC | CCGTG | CCGCA | CCGCT | CCGCC | CCGCG |        | CCGGT |       | CCGGG |
| COTT   | CGA  | CGAAA   | CGAAT | CGAAC | CGAAG  | CGATA   | CGATT | CGATC | CGATG | CGACA | CGACT | CGACC | CGACG | CGAGA  | CGAGT | CGAGC | CGAGG |
| COC.   COCIAA   COCIAT   COCIAC   COCIAC   COCIAC   COCITA   COCITA   COCITA   COCITA   COCITA   COCICA   COC   | CGT  | CGTAA   | CGTAT | CGTAC | CGTAG  | CGTTA   |       |       |       | CGTCA | CGTCT | CGTCC | CGTCG | CGTGA  | CGTGT | CGTGC | CGTGG |
| CGG  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GAAAA GAAAC GAACC GACCA <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GAT: GATAM CATAT GATAC GATAC GATAC GATAC GATTA GATTC GATTC GATCC GATCA GATCT GATCC GATCG GATCG GATCG GATCG GATCG GATCG GATCG GACCT GACCT GACCT GATCG GATCG GATCG GATCG GATCG GATCG GACCT G |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GAC GACAA GACAT GACAC GACAC GACAC GACTA GACTT CACTC GACTC GACCA GA |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GAGA   GAGAT   GAGAC   GAGAC   GAGAC   GAGAC   GAGAT   GAGAT   GAGAT   GAGAC   GAGCAC   GAGCACC   GAGCAC   GAGCACC   GAGCACC   GAGCACC   GAGCACC   GAGCACCC   GAGCACCCCC  GAGCACCCCCC  GAGCACCCCC  GAGCACCCCC  GAGCACCCCCC  GAGCACCCCCC  GAGCACCCCCCC  GAGCACCCCCC  GAGCACCCCCC  GAGCACCCCCC  GAGCACCCCCC  GAGCACCCCCCC  GAGCACCCCCCC  GAGCACCCCCCC  GAGCACCCCCC  GAGCACCCCCCC  GAGCACCCCCCC  GAGCACCCCCCCCCC   |      |         |       |       |        |         |       |       |       |       |       |       |       |        | GATGT |       |       |
| GTA GTAAA GTAAT GTAAC GTAAC GTAAG GTATA GTATT GTATC GTATC GTACG GTACA GTACT GTACC GTACG GT |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GTTA GTTAA GTTAT   GTTAC GTTAC GTTAC GTTAC GTTAC GTTTA GTTTC GTTCC GTTCA GTTCT GTTCC GTTCG GTTCA GTTCT GTTCC GTTCG GTTCA GTTCT GTTCC GTTCA GTTCT GTTCC GTTCA GTTCT GTTCC GTTCA GTTCT GTCCC GTCCA GTCCT GTCCC GTCCA GTCCT GTCCC GTCCA GTCCA GTCCT GTCCC GTCCA GTC   | GAG  |         |       |       |        |         | GAGTT |       |       |       | GAGCT |       |       |        |       |       | GAGGG |
| GTTA GTTAA GTTAT GTTAC GTTAC GTTAC GTTAC GTTAT GTTTC GTTC G  | GTA  | GTAAA   | GTAAT | GTAAC | GTAAG  | GTATA   | GTATT | GTATC | GTATG | GTACA | GTACT | GTACC | GTACG |        | GTAGT | GTAGC | GTAGG |
| GRC GRCAA GRCAT GRCAC GRCAC GRCAC GRCAT GRCTT GRCTT GRCTC GRCCA GRCCT GRCCC GRCCA GRCCA GRCCT GRCCA GR | GTT  | GTTAA   | GTTAT | GTTAC | GTTAG  | GTTTA   |       | GTTTC |       | GTTCA | GTTCT |       | GTTCG |        | GTTGT | GTTGC | GTTGG |
| GTGA   GTGAA   GCAAT   GCGAC   GCGAC   GCGTA   GTGTT   GTGTC   GTGTC   GTGCA   GTGCT   GTGCC   GTGCG   GTGGA   GTGGT   GTGGC   GTGGG   GTGGA   GCGAT   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GCA GCAAA GCAAC GCAAC GCAAC GCAAT GCAAT GCAATC GCAAC GCACA GCCACA GCCACA GCCACA GCCACA GCCACA GCCCA GCCCCA GCCCCA GCCCCA GCCCCA  |      |         |       |       |        |         |       |       |       |       |       |       |       | CTCCA. |       |       |       |
| GCT GCTAA GCTAT GCTAC GCTAC GCTAC GCTAC GCTAT GCTTC GCTTC GCTCC GCTCA GCTCT GCTCC GCTCG GCTCG GCTCG GCTCA GCCCT GCCCC GCCAA GCCCT GCCCC GCCAA GCCCT GCCCC GCCCA GCCCC GCCCC GCCCA GCCCC GCCCA GCCCC GCCCCCC  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GCC GCCAA GCCAT GCCAC GCCAC GCCAC GCCTA GCCTT GCCTC GCCTC GCCCA GCCCT GCCCC GCCCG GCCGA GCCT GCCCC GCCGG GCCGA GCCT GCCCC GCCGG GCCGA GCCT GCCCC GCCGG GCCGA GCCT GCCCC GCCGG GCCGA GCCT GCCCC GCCGA GCCCT GCCCC GCCGA GCCCT GCCCC GCCGA GCCCT GCCCC GCCGA GCAC GCAC   |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GCC  GCGAA GCGAT GCGAC GCGAG GCGTA GCGTT GCGTC GCGTC GCGCA GCGCT GCGCC GCGGG GCGGA GCGGT GCGCC GCGGG<br>  GCA GCAAA GCGAAT GCAAC GCAAC GCAAC GCAAC GCATC GCACC GCACC GCACC GCACC GCACC GCACC GCACC GCACC<br>  GCT GCTAA GCGTAT GCTAC GCTAC GCTAC GCTTA GCTTC GCTCC GCTCA GCCTC GCCCC GCCC G  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GGA GGAAA GGAAT GGAAC GGAAC GGAAC GGATT GGATT GGATC GGATC GGACC GGACC GGACC GGACG GGAGA GGACT GGACC GGAGC GGACC GGACC GGAGC GGAGC GGAGC GGAGC GGAGC GGAGC GGAGC GGAGC GGACC GGAGC GGACC GGAGC GGACC GGACC GGAGC GGACC GG |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GGA GGAAA GGAAT GGAAC GGAAC GGAAC GGATT GGATT GGATC GGATC GGACC GGACC GGACC GGACG GGAGA GGACT GGACC GGAGC GGAGC GGAGC GGAGC GGACC GGAGC GGACC GGACC GGAGC GGAGC GGAGC GGAGC GGAGC GGAGC GGAGC GGAGC GGACC GGAGC GGACC GGAGC GGACC GGAGC GGACC GGAGC GGACC GG | GCG  | GCGAA   | GCGAT | GCGAC | GCGAG  | GCGTA   | GCGTT | GCGTC | GCGTG | GCGCA | GCGCT | GCGCC | GCGCG | GCGGA  | GCGGT | GCGGC | GCGGG |
| GGT GGTAA GGTAT GGTAC GGTAG GGTAT GGTTA GGTTT GGTTC GGTCG GGTCA GGTCT GGTCC GGTCG GGTCA GGTCG GGTCA GGTCG GGTCA GGTCG GGTCG GGTCA GGCCC GGCCG GGCCA GCCA GGCCA GGC |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GGC GGCAA GGCAT GGCAC GGCAG GGCTA GGCTT GGCTC GGCTG GGCCA GGCCA GGCCG GGCGA GGCGT GGCGC GGCGG  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
|  |      |         |       |       |        |         |       |       |       |       |       |       |       |        |       |       |       |
| GOO GOOM GOOM GOOM GOOM GOOM GOOM GOOM   |      | CCCAA   | CCCAT | CCCAC | CCCAG  |         | CCCTT | CCCTC |       |       |       | cccc  |       |        |       | ccccc | ccccc |
|  | 999  | GGGMA   | GGGMI | GGGMU | GGGMG  | GGGIH   | GGGTT | 66610 | 66616 | GGGCA | GGGCT | 66666 | 66666 | GGGGA  | GGGG1 | 66666 | 99999 |

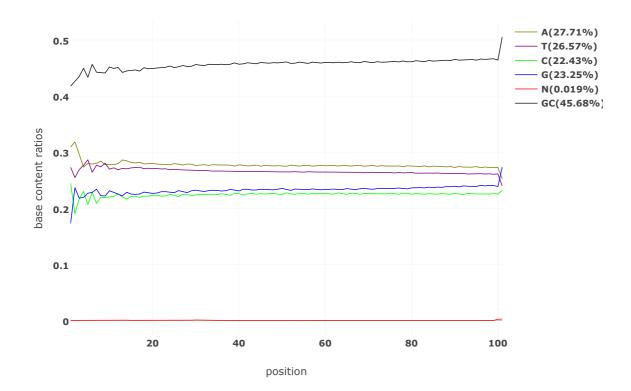
## Before filtering: read2: quality

 $\label{eq:Value of each position will be shown on mouse over.}$ 



#### Before filtering: read2: base contents

Value of each position will be shown on mouse over.



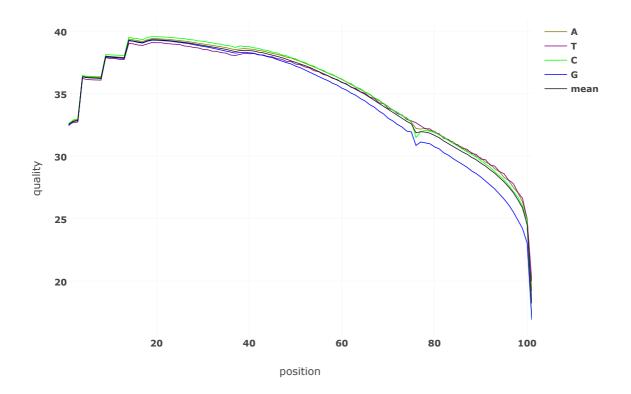
## Before filtering: read2: KMER counting

Darker background means larger counts. The count will be shown on mouse over.

| Darl | ker bac        | kground        | l means        | larger         | counts         | . The c        | ount wi        | II be s        | hown or        | n mouse        | over.          |                |                |                |                |                |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|      | AA             | AT             | AC             | AG             | TA             | TT             | TC             | TG             | CA             | CT             | CC             | CG             | GA             | GT             | GC             | GG             |
| AAA  | AAAAA          | AAAAT          | AAAAC          | AAAAG          | AAATA          | AAATT          | AAATC          | AAATG          | AAACA          | AAACT          | AAACC          | AAACG          | AAAGA          | AAAGT          | AAAGC          | AAAGG          |
| AAT  | AATAA          | AATAT          | AATAC          | AATAG          | AATTA          | AATTT          | AATTC          | AATTG          | AATCA          | AATCT          | AATCC          | AATCG          | AATGA          | AATGT          | AATGC          | AATGG          |
| AAC  | AACAA          | AACAT          | AACAC          | AACAG          | AACTA          | AACTT          | AACTC          | AACTG          | AACCA          | AACCT          | AACCC          | AACCG          | AACGA          | AACGT          | AACGC          | AACGG          |
| AAG  | AAGAA          | AAGAT          | AAGAC          | AAGAG          | AAGTA          | AAGTT          | AAGTC          | AAGTG          | AAGCA          | AAGCT          | AAGCC          | AAGCG          | AAGGA          | AAGGT          | AAGGC          | AAGGG          |
| ATA  | ATAAA          | ATAAT          | ATAAC          | ATAAG          | ATATA          | ATATT          | ATATC          | ATATG          | ATACA          | ATACT          | ATACC          | ATACG          | ATAGA          | ATAGT          | ATAGC          | ATAGG          |
| ATT  | ATTAA          | ATTAT          | ATTAC          | ATTAG          | ATTTA          | ATTTT          | ATTTC          | ATTTG          | ATTCA          | ATTCT          | ATTCC          | ATTCG          | ATTGA          | ATTGT          | ATTGC          | ATTGG          |
| ATC  | ATCAA          | ATCAT          | ATCAC          | ATCAG          | ATCTA          | ATCTT          | ATCTC          | ATCTG          | ATCCA          | ATCCT          | ATCCC          | ATCCG          | ATCGA          | ATCGT          | ATCGC          | ATCGG          |
| ATG  | ATGAA          | ATGAT          | ATGAC          | ATGAG          | ATGTA          | ATGTT          | ATGTC          | ATGTG          | ATGCA          | ATGCT          | ATGCC          | ATGCG          | ATGGA          | ATGGT          | ATGGC          | ATGGG          |
| ACA  | ACAAA          | ACAAT          | ACAAC          | ACAAG          | ACATA          | ACATT          | ACATC          | ACATG          | ACACA          | ACACT          | ACACC          | ACACG          | ACAGA          | ACAGT          | ACAGC          | ACAGG          |
| ACT  | ACTAA          | ACTAT          | ACTAC          | ACTAG          | ACTTA          | ACTTT          | ACTTC          | ACTTG          | ACTCA          | ACTCT          | ACTCC          | ACTCG          | ACTGA          | ACTGT          | ACTGC          | ACTGG          |
| ACC  | ACCAA          | ACCAT          | ACCAC          | ACCAG          | ACCTA          | ACCTT          | ACCTC          | ACCTG          | ACCCA          | ACCCT          | ACCCC          | ACCCG          | ACCGA          | ACCGT          | ACCGC          | ACCGG          |
| ACG  | ACGAA          | ACGAT          | ACGAC          | ACGAG          | ACGTA          | ACGTT          | ACGTC          | ACGTG          | ACGCA          | ACGCT          | ACGCC          | ACGCG          | ACGGA          | ACGGT          | ACGGC          | ACGGG          |
| AGA  | AGAAA          | AGAAT          | AGAAC          | AGAAG          | AGATA          | AGATT          | AGATC          | AGATG          | AGACA          | AGACT          | AGACC          | AGACG          | AGAGA          | AGAGT          | AGAGC          | AGAGG          |
| AGT  | AGTAA          | AGTAT          | AGTAC          | AGTAG          | AGTTA          | AGTTT          | AGTTC          | AGTTG          | AGTCA          | AGTCT          | AGTCC          | AGTCG          | AGTGA          | AGTGT          | AGTGC          | AGTGG          |
| AGC  | AGCAA          | AGCAT          | AGCAC          | AGCAG          | AGCTA          | AGCTT          | AGCTC          | AGCTG          | AGCCA          | AGCCT          | AGCCC          | AGCCG          | AGCGA          | AGCGT          | AGCGC          | AGCGG          |
| AGG  | AGGAA          | AGGAT          | AGGAC          | AGGAG          | AGGTA          | AGGTT          | AGGTC          | AGGTG          | AGGCA          | AGGCT          | AGGCC          | AGGCG          | AGGGA          | AGGGT          | AGGGC          | AGGGG          |
| TAA  | TAAAA          | TAAAT          | TAAAC          | TAAAG          | TAATA          | TAATT          | TAATC          | TAATG          | TAACA          | TAACT          | TAACC          | TAACG          | TAAGA          | TAAGT          | TAAGC          | TAAGG          |
| TAT  | TATAA          | TATAT          | TATAC          | TATAG          | TATTA          | TATTT          | TATTC          | TATTG          | TATCA          | TATCT          | TATCC          | TATCG          | TATGA          | TATGT          | TATGC          | TATGG          |
| TAC  | TACAA          | TACAT          | TACAC          | TACAG          | TACTA          | TACTT          | TACTC          | TACTG          | TACCA          | TACCT          | TACCC          | TACCG          | TACGA          | TACGT          | TACGC          | TACGG          |
| TAG  | TAGAA          | TAGAT          | TAGAC<br>TTAAC | TAGAG<br>TTAAG | TAGTA<br>TTATA | TAGTT<br>TTATT | TAGTC<br>TTATC | TAGTG<br>TTATG | TAGCA<br>TTACA | TAGCT<br>TTACT | TAGCC<br>TTACC | TAGCG<br>TTACG | TAGGA<br>TTAGA | TAGGT<br>TTAGT | TAGGC<br>TTAGC | TAGGG<br>TTAGG |
| TTT  | TTTAAA         | TTTAT          | TTAAC          | TTTAG          | TTTTA          | TTTTT          | TTATC          | TTATG          | TTACA          | TTTCT          | TTACC          | TTACG          | TTAGA          | TTAGT          | TTTGC          | TTTGG          |
| TTC  | TTCAA          | TTCAT          | TTTAC          | TTCAG          | TTCTA          | TTCTT          | TTCTC          | TTCTG          | TTCCA          | TTCCT          | TTCCC          | TTTCG          | TTTGA          | TTCGT          | TTCGC          | TTTGG          |
| TTG  | TTGAA          | TTGAT          | TTGAC          | TTGAG          | TTGTA          | TTGTT          | TTGTC          | TTGTG          | TTGCA          | TTGCT          | TTGCC          | TTGCG          | TTGGA          | TTGGT          | TTGGC          | TTGGG          |
| TCA  | TCAAA          | TCAAT          | TIGAC          | TCAAG          | TCATA          | TCATT          | TCATC          | TIGIG<br>TCATC | TCACA          | TCACT          | TCACC          | TCACG          | TOOGA          | TCAGT          | TCAGC          | TCAGG          |
| TCT  | TCTAA          | TCTAT          | TCTAC          | TCTAG          | TCTTA          | TCTTT          | TCTTC          | TCTTG          | TCTCA          | TCTCT          | TCTCC          | TCTCG          | TCTGA          | TCTGT          | TCTGC          | TCTGG          |
| TCC  | TCCAA          | TCCAT          | TCCAC          | TCCAG          | TCCTA          | TCCTT          | TCCTC          | TCCTG          | TCCCA          | TCCCT          | TCCCC          | TCCCG          | TCCCA          | TCCGT          | TCCGC          | TCCGG          |
| TCG  | TCGAA          | TCGAT          | TCGAC          | TCGAG          | TCGTA          | TCGTT          | TCGTC          | TCGTG          | TCGCA          | TCGCT          | TCGCC          | TCGCG          | TCGGA          | TCGGT          | TCGGC          | TCGGG          |
| TGA  | TCAAA          | TCAAT          | TCAAC          | TCAAC          | TCGIA          | TGATT          | TCATC          | TCATC          | TGACA          | TCACT          | TGACC          | TCACC          | TCACA          | TGAGT          | TCACC          | TGAGG          |
| TGT  | TGTAA          | TGTAT          | TGTAC          | TGTAG          | TGTTA          | TGTTT          | TGTTC          | TGTTG          | TGTCA          | TGTCT          | TGTCC          | TGTCG          | TGTGA          | TGTGT          | TGTGC          | TGTGG          |
| TGC  | TGCAA          | TGCAT          | TGCAC          | TGCAG          | TGCTA          | TGCTT          | TGCTC          | TGCTG          | TGCCA          | TGCCT          | TGCCC          | TGCCG          | TGCGA          | TGCGT          | TGCGC          | TGCGG          |
| TGG  | TGGAA          | TGGAT          | TGGAC          | TGGAG          | TGGTA          | TGGTT          | TGGTC          | TGGTG          | TGGCA          | TGGCT          | TGGCC          | TGGCG          | TGGGA          | TGGGT          | TGGGC          | TGGGG          |
| CAA  | CAAAA          | CAAAT          | 24442          | CAAAG          | CAATA          | CAATT          | CAATC          | CAATG          | CAACA          | CAACT          | CAACC          | CAACG          | CAAGA          | CAAGT          | CAAGC          | CAAGG          |
| CAT  | CATAA          | CATAT          | CATAC          | CATAG          | CATTA          | CATTT          | CATTC          | CATTG          | CATCA          | CATCT          | CATCC          | CATCG          | CATGA          | CATGT          | CATGC          | CATGG          |
| CAC  | CACAA          | CACAT          | CACAC          | CACAG          | CACTA          | CACTT          | CACTC          | CACTG          | CACCA          | CACCT          | CACCC          | CACCG          | CACGA          | CACGT          | CACGC          | CACGG          |
| CAG  | CAGAA          | CAGAT          | CAGAC          | CAGAG          | CAGTA          | CAGTT          | CAGTC          | CAGTG          | CAGCA          | CAGCT          | CAGCC          | CAGCG          | CAGGA          | CAGGT          | CAGGC          | CAGGG          |
| CTA  | CTAAA          | CTAAT          | CTAAC          | CTAAG          | CTATA          | CTATT          | CTATC          | CTATG          | CTACA          | CTACT          | CTACC          | CTACG          | CTAGA          | CTAGT          | CTAGC          | CTAGG          |
| CTT  | CTTAA          | CTTAT          | CTTAC          | CTTAG          | CTTTA          | CTTTT          | CTTTC          | CTTTG          | CTTCA          | CTTCT          | CTTCC          | CTTCG          | CTTGA          | CTTGT          | CTTGC          | CTTGG          |
| CTC  | CTCAA          | CTCAT          | CTCAC          | CTCAG          | CTCTA          | CTCTT          | CTCTC          | CTCTG          | CTCCA          | CTCCT          | CTCCC          | CTCCG          | CTCGA          | CTCGT          | CTCGC          | CTCGG          |
| CTG  | CTGAA          | CTGAT          | CTGAC          | CTGAG          | CTGTA          | CTGTT          | CTGTC          | CTGTG          | CTGCA          | CTGCT          | CTGCC          | CTGCG          | CTGGA          | CTGGT          | CTGGC          | CTGGG          |
| CCA  | CCAAA          | CCAAT          | CCAAC          | CCAAG          | CCATA          | CCATT          | CCATC          | CCATG          | CCACA          | CCACT          | CCACC          | CCACG          | CCAGA          | CCAGT          | CCAGC          | CCAGG          |
| CCT  | CCTAA          | CCTAT          | CCTAC          | CCTAG          | CCTTA          | CCTTT          | CCTTC          | CCTTG          | CCTCA          | CCTCT          | CCTCC          | CCTCG          | CCTGA          | CCTGT          | CCTGC          | CCTGG          |
| CCC  | CCCAA          | CCCAT          | CCCAC          | CCCAG          | CCCTA          | CCCTT          | CCCTC          | CCCTG          | CCCCA          | CCCCT          | CCCCC          | CCCCG          | CCCGA          | CCCGT          | CCCGC          | CCCGG          |
| CCG  | CCGAA          | CCGAT          | CCGAC          | CCGAG          | CCGTA          | CCGTT          | CCGTC          | CCGTG          | CCGCA          | CCGCT          | CCGCC          | CCGCG          | CCGGA          | CCGGT          | CCGGC          | CCGGG          |
| CGA  | CGAAA          | CGAAT          | CGAAC          | CGAAG          | CGATA          | CGATT          | CGATC          | CGATG          | CGACA          | CGACT          | CGACC          | CGACG          | CGAGA          | CGAGT          | CGAGC          | CGAGG          |
| CGT  | CGTAA          | CGTAT          | CGTAC          | CGTAG          | CGTTA          | CGTTT          | CGTTC          | CGTTG          | CGTCA          | CGTCT          | CGTCC          | CGTCG          | CGTGA          | CGTGT          | CGTGC          | CGTGG          |
| CGC  | CGCAA          | CGCAT          | CGCAC          | CGCAG          | CGCTA          | CGCTT          | CGCTC          | CGCTG          | CGCCA          | CGCCT          | CGCCC          | CGCCG          | CGCGA          | CGCGT          | CGCGC          | CGCGG          |
| CGG  | CGGAA          | CGGAT          | CGGAC          | CGGAG          | CGGTA          | CGGTT          | CGGTC          | CGGTG          | CGGCA          | CGGCT          | CGGCC          | CGGCG          | CGGGA          | CGGGT          | CGGGC          | CGGGG          |
| GAA  | GAAAA          | GAAAT          | GAAAC          | GAAAG          | GAATA          | GAATT          | GAATC          | GAATG          | GAACA          | GAACT          | GAACC          | GAACG          | GAAGA          | GAAGT          | GAAGC          | GAAGG          |
| GAT  | GATAA          | GATAT          | GATAC          | GATAG          | GATTA          | GATTT          | GATTC          | GATTG          | GATCA          | GATCT          | GATCC          | GATCG          | GATGA          | GATGT          | GATGC          | GATGG          |
| GAC  | GACAA          | GACAT          | GACAC          | GACAG          | GACTA          | GACTT          | GACTC          | GACTG          | GACCA          | GACCT          | GACCC          | GACCG          | GACGA          | GACGT          | GACGC          | GACGG          |
| GAG  | GAGAA          | GAGAT          | GAGAC          | GAGAG          | GAGTA          | GAGTT          | GAGTC          | GAGTG          | GAGCA          | GAGCT          | GAGCC          | GAGCG          | GAGGA          | GAGGT          | GAGGC          | GAGGG          |
| GTA  | GTAAA          | GTAAT          | GTAAC          | GTAAG          | GTATA          | GTATT          | GTATC          | GTATG          | GTACA          | GTACT          | GTACC          | GTACG          | GTAGA          | GTAGT          | GTAGC          | GTAGG          |
| GTC  | GTTAA<br>GTCAA | GTTAT          | GTTAC<br>GTCAC | GTTAG<br>GTCAG | GTTTA<br>GTCTA | GTTTT          | GTTTC<br>GTCTC | GTTTG<br>GTCTG | GTTCA<br>GTCCA | GTTCT          | GTTCC<br>GTCCC | GTTCG<br>GTCCG | GTTGA<br>GTCGA | GTTGT<br>GTCGT | GTTGC<br>GTCGC | GTTGG<br>GTCGG |
|      | GTCAA          | GTCAT<br>GTGAT | GTCAC          | GTCAG          | GTCTA          |                | GTCTC          | GTCTG          | GTCCA          | GTCCT          | GTGCC          | GTCCG          | GTCGA          | GTCGT          | GTCGC          | GTCGG          |
| GTG  | GCAAA          | GCAAT          | GCAAC          | GCAAG          | GCATA          | GTGTT<br>GCATT | GCATC          | GCATG          | GCACA          | GCACT          | GCACC          | GCACG          | GCAGA          | GCAGT          | GCAGC          | GCAGG          |
| GCA  | GCTAA          | GCAAT          | GCTAC          | GCAAG          |                |                |                |                | GCTCA          |                | GCACC          | GCACG          | GCAGA          | GCAGT          | GCAGC          | GCAGG          |
| GCC  | GCCAA          | GCTAT          | GCCAC          | GCTAG          | GCTTA<br>GCCTA | GCTTT          | GCTTC          | GCTTG<br>GCCTG | GCCCA          | GCCCT          | GCCCC          | GCTCG          | GCCGA          | GCTGT          | GCTGC          | GCTGG          |
| GCG  | GCGAA          | GCGAT          | GCCAC          | GCCAG          | GCCTA          | GCGTT          | GCGTC          | GCGTG          | GCGCA          | GCGCT          | GCGCC          | GCGCG          | GCCGA          | GCGGT          | GCGGC          | GCCGG          |
| GGA  | GGAAA          | GGAAT          | GGAAC          | GGAAG          | GGGTA          | GCGTT          | GCGTC          | GGGTG          | GGACA          | GGGCT          | GGACC          | GGACG          | GGAGA          | GCGGT          | GGAGC          | GCGGG          |
| GGA  | GGAAA          | GGTAT          | GGTAC          | GGAAG          | GGTTA          | GGTTT          | GGTTC          | GGTTG          | GGACA          | GGACT          | GGACC          | GGACG          | GGAGA          | GGTGT          | GGTGC          | GGAGG          |
| GGT  | GGCAA          | GGCAT          | GGTAC          | GGTAG          | GGCTA          | GGCTT          | GGCTC          | GGCTG          | GGCCA          | GGCCT          | GGCCC          | GGCCG          | GGTGA          | GGCGT          | GGCGC          | GGCGG          |
| GGG  | CCCAA          | CCCAT          | CCCAC          | CCCAC          | CCCTA          | CCCTT          | CCCTC          | CCCTC          | GGGCA          | CCCCT          | CCCCC          | CCCCC          | CCCCA          | CCCCT          | CCCCC          | GGGGG          |
| 666  | GGGMA          | GGGW1          | GGGMC          | GGGMG          | GGGIA          | 99911          | 66610          | 66616          | GGGCA          | GGGC 1.        | 66666          | 66666          | HUUUU          | 66661          | 39999          | 00000          |

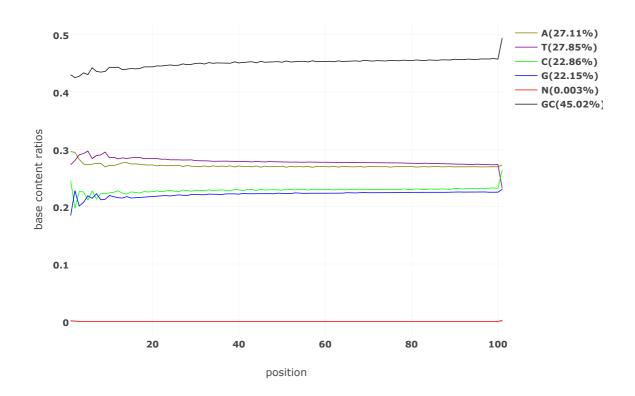
## After filtering: read1: quality

Value of each position will be shown on mouse over.



After filtering: read1: base contents

Value of each position will be shown on mouse over.



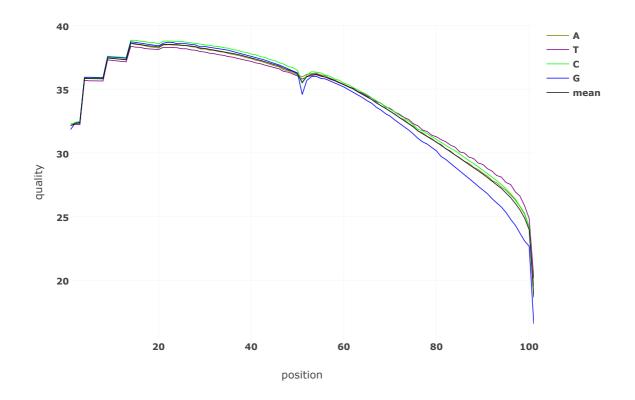
After filtering: read1: KMER counting

Darker background means larger counts. The count will be shown on mouse over.

|     | AA             | AT             | AC             | AG             | TA             | TT             | TC             | TG             | CA             | CT             | CC             | CG             | GA             | GT             | GC             | GG             |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| AAA | AAAAA          | AAAAT          | AAAAC          | AAAAG          | AAATA          | AAATT          | AAATC          | AAATG          | AAACA          | AAACT          | AAACC          | AAACG          | AAAGA          | AAAGT          | AAAGC          | AAAGG          |
| AAT | AATAA          | AATAT          | AATAC          | AATAG          | AATTA          | AATTT          | AATTC          | AATTG          | AATCA          | AATCT          | AATCC          | AATCG          | AATGA          | AATGT          | AATGC          | AATGG          |
| AAC | AACAA          | AACAT          | AACAC          | AACAG          | AACTA          | AACTT          | AACTC          | AACTG          | AACCA          | AACCT          | AACCC          | AACCG          | AACGA          | AACGT          | AACGC          | AACGG          |
| AAG | AAGAA          | AAGAT          | AAGAC          | AAGAG          | AAGTA          | AAGTT          | AAGTC          | AAGTG          | AAGCA          | AAGCT          | AAGCC          | AAGCG          | AAGGA          | AAGGT          | AAGGC          | AAGGG          |
| ATA | ATAAA          | ATAAT          | ATAAC          | ATAAG          | ATATA          | ATATT          | ATATC          | ATATG          | ATACA          | ATACT          | ATACC          | ATACG          | ATAGA          | ATAGT          | ATAGC          | ATAGG          |
| ATT | ATTAA          | ATTAT          | ATTAC          | ATTAG          | ATTTA          | ATTTT          | ATTTC          | ATTTG          | ATTCA          | ATTCT          | ATTCC          | ATTCG          | ATTGA          | ATTGT          | ATTGC          | ATTGG          |
| ATC | ATCAA          | ATCAT          | ATCAC          | ATCAG          | ATCTA          | ATCTT          | ATCTC          | ATCTG          | ATCCA          | ATCCT          | ATCCC          | ATCCG          | ATCGA          | ATCGT          | ATCGC          | ATCGG          |
| ATG | ATGAA          | ATGAT          | ATGAC          | ATGAG          | ATGTA          | ATGTT          | ATGTC          | ATGTG          | ATGCA          | ATGCT          | ATGCC          | ATGCG          | ATGGA          | ATGGT          | ATGGC          | ATGGG          |
| ACA | ACAAA<br>ACTAA | ACAAT<br>ACTAT | ACAAC<br>ACTAC | ACAAG<br>ACTAG | ACATA<br>ACTTA | ACATT<br>ACTTT | ACATC<br>ACTTC | ACATG<br>ACTTG | ACACA<br>ACTCA | ACACT<br>ACTCT | ACACC<br>ACTCC | ACACG<br>ACTCG | ACAGA<br>ACTGA | ACAGT<br>ACTGT | ACAGC<br>ACTGC | ACAGG<br>ACTGG |
| ACC | ACCAA          | ACCAT          | ACCAC          | ACCAG          | ACCTA          | ACCTT          | ACCTC          | ACCTG          | ACCCA          | ACCCT          | ACCCC          | ACCCG          | ACCGA          | ACCGT          | ACCGC          | ACCGG          |
| ACG | ACGAA          | ACCAT          | ACCAC          | ACCAG          |                |                |                |                | ACCCA          | ACCCT          | ACCCC          |                | ACCGA          | ACCGT          | ACCGC          | ACCGG          |
| AGA | ACGAA          | ACGAT          | AGAAC          | ACGAG          | ACGTA<br>AGATA | ACGTT<br>AGATT | ACGTC<br>AGATC | ACGTG<br>AGATG | AGACA          | AGACT          | AGACC          | ACGCG<br>AGACG | AGAGA          | ACGGT          | ACGGC          | AGAGG          |
| AGT | AGTAA          | AGTAT          | AGTAC          | AGTAG          | AGTTA          | AGTTT          | AGTTC          | AGTTG          | AGTCA          | AGTCT          | AGTCC          | AGTCG          | AGTGA          | AGTGT          | AGAGC          | AGTGG          |
| AGC | AGCAA          | AGCAT          | AGCAC          | AGCAG          | AGCTA          | AGCTT          | AGCTC          | AGCTG          | AGCCA          | AGCCT          | AGCCC          | AGCCG          | AGCGA          | AGCGT          | AGCGC          | AGCGG          |
| AGG | AGGAA          | AGGAT          | AGGAC          | AGGAG          | AGGTA          | AGGTT          | AGGTC          | AGGTG          | AGGCA          | AGGCT          | AGGCC          | AGGCG          | AGGGA          | AGGGT          | AGGGC          | AGGGG          |
| TAA | TAAAA          | TAAAT          | TAAAC          | TAAAG          | TAATA          | TAATT          | TAATC          | TAATG          | TAACA          | TAACT          | TAACC          | TAACG          | TAAGA          | TAAGT          | TAAGC          | TAAGG          |
| TAT | TATAA          | TATAT          | TATAC          | TATAG          | TATTA          | TATTT          | TATTC          | TATTG          | TATCA          | TATCT          | TATCC          | TATCG          | TATGA          | TATGT          | TATGC          | TATGG          |
| TAC | TACAA          | TACAT          | TACAC          | TACAG          | TACTA          | TACTT          | TACTC          | TACTG          | TACCA          | TACCT          | TACCC          | TACCG          | TACGA          | TACGT          | TACGC          | TACGG          |
| TAG | TAGAA          | TAGAT          | TAGAC          | TAGAG          | TAGTA          | TAGTT          | TAGTC          | TAGTG          | TAGCA          | TAGCT          | TAGCC          | TAGCG          | TAGGA          | TAGGT          | TAGGC          | TAGGG          |
| TTA | TTAAA          | TTAAT          | TTAAC          | TTAAG          | TTATA          | TTATT          | TTATC          | TTATG          | TTACA          | TTACT          | TTACC          | TTACG          | TTAGA          | TTAGT          | TTAGC          | TTAGG          |
| TTT | TTTAA          | TTTAT          | TTTAC          | TTTAG          | TTTTA          | TTTTT          | TTTTC          | TTTTG          | TTTCA          | TTTCT          | TTTCC          | TTTCG          | TTTGA          | TTTGT          | TTTGC          | TTTGG          |
| TTC | TTCAA          | TTCAT          | TTCAC          | TTCAG          | TTCTA          | TTCTT          | TTCTC          | TTCTG          | TTCCA          | TTCCT          | TTCCC          | TTCCG          | TTCGA          | TTCGT          | TTCGC          | TTCGG          |
| TTG | TTGAA          | TTGAT          | TTGAC          | TTGAG          | TTGTA          | TTGTT          | TTGTC          | TTGTG          | TTGCA          | TTGCT          | TTGCC          | TTGCG          | TTGGA          | TTGGT          | TTGGC          | TTGGG          |
| TCA | TCAAA          | TCAAT          | TCAAC          | TCAAG          | TCATA          | TCATT          | TCATC          | TCATG          | TCACA          | TCACT          | TCACC          | TCACG          | TCAGA          | TCAGT          | TCAGC          | TCAGG          |
| TCT | TCTAA          | TCTAT          | TCTAC          | TCTAG          | TCTTA          | TCTTT          | TCTTC          | TCTTG          | TCTCA          | TCTCT          | TCTCC          | TCTCG          | TCTGA          | TCTGT          | TCTGC          | TCTGG          |
| TCC | TCCAA          | TCCAT          | TCCAC          | TCCAG          | TCCTA          | TCCTT          | TCCTC          | TCCTG          | TCCCA          | TCCCT          | TCCCC          | TCCCG          | TCCGA          | TCCGT          | TCCGC          | TCCGG          |
| TCG | TCGAA          | TCGAT          | TCGAC          | TCGAG          | TCGTA          | TCGTT          | TCGTC          | TCGTG          | TCGCA          | TCGCT          | TCGCC          | TCGCG          | TCGGA          | TCGGT          | TCGGC          | TCGGG          |
| TGA | TGAAA          | TGAAT          | TGAAC          | TGAAG          | TGATA          | TGATT          | TGATC          | TGATG          | TGACA          | TGACT          | TGACC          | TGACG          | TGAGA          | TGAGT          | TGAGC          | TGAGG          |
| TGT | TGTAA          | TGTAT          | TGTAC          | TGTAG          | TGTTA          | TGTTT          | TGTTC          | TGTTG          | TGTCA          | TGTCT          | TGTCC          | TGTCG          | TGTGA          | TGTGT          | TGTGC          | TGTGG          |
| TGC | TGCAA          | TGCAT          | TGCAC          | TGCAG          | TGCTA          | TGCTT          | TGCTC          | TGCTG          | TGCCA          | TGCCT          | TGCCC          | TGCCG          | TGCGA          | TGCGT          | TGCGC          | TGCGG          |
| TGG |                | TGGAT          | TGGAC          | TGGAG          | TGGTA          | TGGTT          | TGGTC          | TGGTG          | TGGCA          | TGGCT          | TGGCC          | TGGCG          | TGGGA          | TGGGT          | TGGGC          | TGGGG          |
| CAA | CAAAA          | CAAAT          | CAAAC          | CAAAG          | CAATA          | CAATT          | CAATC          | CAATG          | CAACA          | CAACT          | CAACC          | CAACG          | CAAGA          | CAAGT          | CAAGC          | CAAGG          |
| CAT | CATAA          | CATAT          | CATAC          | CATAG          | CATTA          | CATTT          | CATTC          | CATTG          | CATCA          | CATCT          | CATCC          | CATCG          | CATGA          | CATGT          | CATGC          | CATGG          |
| CAC | CACAA          | CACAT          | CACAC          | CACAG          | CACTA          | CACTT          | CACTC          | CACTG          | CACCA          | CACCT          | CACCC          | CACCG          | CACGA          | CACGT          | CACGC          | CACGG          |
| CAG | CAGAA          | CAGAT          | CAGAC          | CAGAG          | CAGTA          | CAGTT          | CAGTC          | CAGTG          | CAGCA          | CAGCT          | CAGCC          | CAGCG          | CAGGA          | CAGGT          | CAGGC          | CAGGG          |
| CTA | CTAAA<br>CTTAA | CTAAT          | CTAAC<br>CTTAC | CTAAG          | CTATA<br>CTTTA | CTATT<br>CTTTT | CTATC<br>CTTTC | CTATG<br>CTTTG | CTACA<br>CTTCA | CTACT          | CTACC          | CTACG<br>CTTCG | CTAGA          | CTAGT<br>CTTGT | CTAGC          | CTAGG          |
| CTC | CTCAA          | CTCAT          | CTCAC          | CTTAG<br>CTCAG | CTCTA          | CTCTT          | CTCTC          | CTCTG          | CTCCA          | CTCCT          | CTTCC          | CTCCG          | CTTGA<br>CTCGA | CTCGT          | CTTGC<br>CTCGC | CTTGG<br>CTCGG |
| CTG | CTGAA          | CTGAT          | CTGAC          | CTGAG          | CTGTA          | CTGTT          | CTGTC          | CTGTG          | CTGCA          | CTGCT          | CTGCC          | CTGCG          | CTGGA          | CTGGT          | CTGGC          | CTGGG          |
| CCA | CCAAA          | CCAAT          | CCAAC          | CCAAG          | CCATA          | CCATT          | CCATC          | CCATG          | CCACA          | CCACT          | CCACC          | CCACG          | CCAGA          | CCAGT          | CCAGC          | CCAGG          |
| CCT | CCTAA          | CCTAT          | CCTAC          | CCTAG          | CCTTA          | CCTTT          | CCTTC          | CCTTG          | CCTCA          | CCTCT          | CCTCC          | CCTCG          | CCTGA          | CCTGT          | CCTGC          | CCTGG          |
| ccc | CCCAA          | CCCAT          | CCCAC          | CCCAG          | CCCTA          | CCCTT          | CCCTC          | CCCTG          | CCCCA          | CCCCT          | ccccc          | CCCCG          | CCCGA          | CCCGT          | CCCGC          | CCCGG          |
| CCG | CCGAA          | CCGAT          | CCGAC          | CCGAG          | CCGTA          | CCGTT          | CCGTC          | CCGTG          | CCGCA          | CCGCT          | CCGCC          | CCGCG          | CCGGA          | CCGGT          | CCGGC          | CCGGG          |
| CGA | CGAAA          | CGAAT          | CGAAC          | CGAAG          | CGATA          | CGATT          | CGATC          | CGATG          | CGACA          | CGACT          | CGACC          | CGACG          | CGAGA          | CGAGT          | CGAGC          | CGAGG          |
| CGT | CGTAA          | CGTAT          | CGTAC          | CGTAG          | CGTTA          | CGTTT          | CGTTC          | CGTTG          | CGTCA          | CGTCT          | CGTCC          | CGTCG          | CGTGA          | CGTGT          | CGTGC          | CGTGG          |
| CGC | CGCAA          | CGCAT          | CGCAC          | CGCAG          | CGCTA          | CGCTT          | CGCTC          | CGCTG          | CGCCA          | CGCCT          | CGCCC          | CGCCG          | CGCGA          | CGCGT          | CGCGC          | CGCGG          |
| CGG | CGGAA          | CGGAT          | CGGAC          | CGGAG          | CGGTA          | CGGTT          | CGGTC          | CGGTG          | CGGCA          | CGGCT          | CGGCC          | CGGCG          | CGGGA          | CGGGT          | CGGGC          | CGGGG          |
| GAA | GAAAA          | GAAAT          | GAAAC          | GAAAG          | GAATA          | GAATT          | GAATC          | GAATG          | GAACA          | GAACT          | GAACC          | GAACG          | GAAGA          | GAAGT          | GAAGC          | GAAGG          |
| GAT | GATAA          | GATAT          | GATAC          | GATAG          | GATTA          | GATTT          | GATTC          | GATTG          | GATCA          | GATCT          | GATCC          | GATCG          | GATGA          | GATGT          | GATGC          | GATGG          |
| GAC | GACAA          | GACAT          | GACAC          | GACAG          | GACTA          | GACTT          | GACTC          | GACTG          | GACCA          | GACCT          | GACCC          | GACCG          | GACGA          | GACGT          | GACGC          | GACGG          |
| GAG | GAGAA          | GAGAT          | GAGAC          | GAGAG          | GAGTA          | GAGTT          | GAGTC          | GAGTG          | GAGCA          | GAGCT          | GAGCC          | GAGCG          | GAGGA          | GAGGT          | GAGGC          | GAGGG          |
| GTA | GTAAA          | GTAAT          | GTAAC          | GTAAG          | GTATA          | GTATT          | GTATC          | GTATG          | GTACA          | GTACT          | GTACC          | GTACG          | GTAGA          | GTAGT          | GTAGC          | GTAGG          |
| GTT | GTTAA          | GTTAT          | GTTAC          | GTTAG          | GTTTA          | GTTTT          | GTTTC          | GTTTG          | GTTCA          | GTTCT          | GTTCC          | GTTCG          | GTTGA          | GTTGT          | GTTGC          | GTTGG          |
| GTC |                | GTCAT          | GTCAC          | GTCAG          | GTCTA          | GTCTT          | GTCTC          | GTCTG          | GTCCA          | GTCCT          | GTCCC          | GTCCG          | GTCGA          | GTCGT          | GTCGC          | GTCGG          |
| GTG | GTGAA          | GTGAT          | GTGAC          | GTGAG          | GTGTA          | GTGTT          | GTGTC          | GTGTG          | GTGCA          | GTGCT          | GTGCC          | GTGCG          | GTGGA          | GTGGT          | GTGGC          | GTGGG          |
| GCA | GCAAA          | GCAAT          | GCAAC          | GCAAG          | GCATA          | GCATT          | GCATC          | GCATG          | GCACA          | GCACT          | GCACC          | GCACG          | GCAGA          | GCAGT          | GCAGC          | GCAGG          |
| GCT | GCTAA          | GCTAT          | GCTAC          | GCTAG          | GCTTA          | GCTTT          | GCTTC          | GCTTG          | GCTCA          | GCTCT          | GCTCC          | GCTCG          | GCTGA          | GCTGT          | GCTGC          | GCTGG          |
| GCC | GCCAA          | GCCAT          | GCCAC          | GCCAG          | GCCTA          | GCCTT          | GCCTC          | GCCTG          | GCCCA          | GCCCT          | GCCCC          | GCCCG          | GCCGA          | GCCGT          | GCCGC          | GCCGG          |
| GCG | GCGAA          | GCGAT          | GCGAC          | GCGAG          | GCGTA          | GCGTT          | GCGTC          | GCGTG          | GCGCA          | GCGCT<br>GGACT | 00000          | GCGCG          | GCGGA          | GCGGT          | 29929          | GCGGG<br>GGAGG |
| GGA | GGAAA<br>GGTAA | GGAAT<br>GGTAT | GGAAC<br>GGTAC | GGAAG<br>GGTAG | GGATA<br>GGTTA | GGATT<br>GGTTT | GGATC<br>GGTTC | GGATG<br>GGTTG | GGACA<br>GGTCA | GGACT          | GGACC<br>GGTCC | GGACG<br>GGTCG | GGAGA<br>GGTGA | GGAGT<br>GGTGT | GGAGC<br>GGTGC | GGAGG          |
| GGC | GGCAA          | GGCAT          | GGCAC          | GGTAG          | GGCTA          | GGTTT          | GGCTC          | GGCTG          | GGCCA          | GGCCT          | GGCCC          | GGCCG          | GGTGA          | GGCGT          | GGCGC          | GGCGG          |
| GGG | GGCAA          | GGCAT          | GGGAC          | GGCAG          | GGGTA          | GGGTT          | GGGTC          | GGGTG          | GGGCA          | GGGCT          | GGGCC          | GGGCG          | GGCGA          | GGGGT          | GGGGC          | GGGGG          |
| 999 | JUJAN          | 333A1          | GGGAC          | GGGAG          | 3331H          | 33311          | 33310          | 99919          | GGGCA          | 99901          | 99900          | 33355          | HOUGE          | 33331          | 33335          | 33333          |
|     |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |

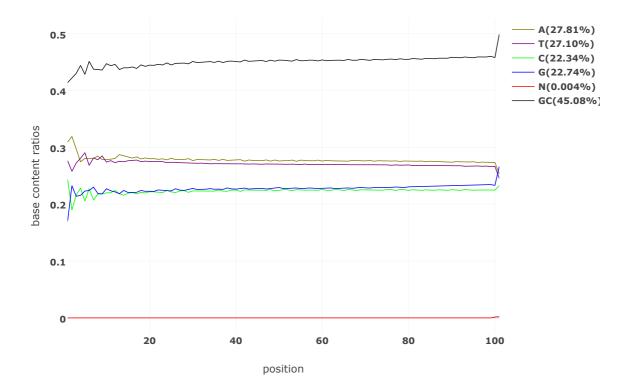
## After filtering: read2: quality

Value of each position will be shown on mouse over.



## After filtering: read2: base contents

Value of each position will be shown on mouse over.



#### After filtering: read2: KMER counting

Darker background means larger counts. The count will be shown on mouse over.

|     | AA    | AT    | AC    | AG    | TA    | TT    | TC    | TG    | CA    | CT    | CC    | CG    | GA    | GT    | GC    | GG    |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| AA  | AAAAA | AAAAT | AAAAC | AAAAG | AAATA | AAATT | AAATC | AAATG | AAACA | AAACT | AAACC | AAACG | AAAGA | AAAGT | AAAGC | AAAGG |
| AT  | AATAA | AATAT | AATAC | AATAG | AATTA | AATTT | AATTC | AATTG | AATCA | AATCT | AATCC | AATCG | AATGA | AATGT | AATGC | AATGO |
| AC  | AACAA | AACAT | AACAC | AACAG | AACTA | AACTT | AACTC | AACTG | AACCA | AACCT | AACCC | AACCG | AACGA | AACGT | AACGC | AACGO |
| AG  | AAGAA | AAGAT | AAGAC | AAGAG | AAGTA | AAGTT | AAGTC | AAGTG | AAGCA | AAGCT | AAGCC | AAGCG | AAGGA | AAGGT | AAGGC | AAGGG |
| TA  | ATAAA | ATAAT | ATAAC | ATAAG | ATATA | ATATT | ATATC | ATATG | ATACA | ATACT | ATACC | ATACG | ATAGA | ATAGT | ATAGC | ATAGO |
| TT  | ATTAA | ATTAT | ATTAC | ATTAG | ATTTA | ATTTT | ATTTC | ATTTG | ATTCA | ATTCT | ATTCC | ATTCG | ATTGA | ATTGT | ATTGC | ATTG  |
| TC  | ATCAA | ATCAT | ATCAC | ATCAG |       | ATCTT | ATCTC | ATCTG | ATCCA | ATCCT | ATCCC | ATCCG | ATCGA | ATCGT | ATCGC | ATCG  |
| TG  | ATGAA | ATGAT | ATGAC | ATGAG | ATGTA | ATGTT | ATGTC | ATGTG | ATGCA | ATGCT | ATGCC | ATGCG | ATGGA | ATGGT | ATGGC | ATGG  |
| CA  | ACAAA | ACAAT | ACAAC | ACAAG | ACATA | ACATT | ACATC | ACATG | ACACA | ACACT | ACACC | ACACG | ACAGA | ACAGT | ACAGC | ACAG  |
| CT  | ACTAA | ACTAT | ACTAC | ACTAG | ACTTA | ACTTT | ACTTC | ACTTG | ACTCA | ACTCT | ACTCC | ACTCG | ACTGA | ACTGT | ACTGC | ACTG  |
| CC  | ACCAA | ACCAT | ACCAC | ACCAG |       | ACCTT | ACCTC | ACCTG | ACCCA | ACCCT | ACCCC | ACCCG | ACCGA | ACCGT | ACCGC | ACCG  |
| CG  | ACGAA | ACGAT | ACGAC | ACGAG |       | ACGTT | ACGTC | ACGTG | ACGCA | ACGCT | ACGCC | ACGCG | ACGGA | ACGGT | ACGGC | ACGG  |
| GΑ  | AGAAA | AGAAT | AGAAC | AGAAG |       | AGATT | AGATC | AGATG | AGACA | AGACT | AGACC | AGACG | AGAGA | AGAGT | AGAGC | AGAG  |
| GT  | AGTAA | AGTAT | AGTAC | AGTAG | AGTTA | AGTTT | AGTTC | AGTTG | AGTCA | AGTCT | AGTCC | AGTCG | AGTGA | AGTGT | AGTGC | AGTG  |
| GC  | AGCAA | AGCAT | AGCAC | AGCAG |       | AGCTT | AGCTC | AGCTG | AGCCA | AGCCT | AGCCC | AGCCG | AGCGA | AGCGT | AGCGC | AGCG  |
| .GG | AGGAA | AGGAT | AGGAC | AGGAG | AGGTA | AGGTT | AGGTC | AGGTG | AGGCA | AGGCT | AGGCC | AGGCG | AGGGA | AGGGT | AGGGC | AGGG  |
| AA  | TAAAA | TAAAT | TAAAC | TAAAG | TAATA | TAATT | TAATC | TAATG | TAACA | TAACT | TAACC | TAACG | TAAGA | TAAGT | TAAGC | TAAG  |
| AT  | TATAA | TATAT | TATAC | TATAG | TATTA | TATTT | TATTC | TATTG | TATCA | TATCT | TATCC | TATCG | TATGA | TATGT | TATGC | TATG  |
| AC  | TACAA | TACAT | TACAC | TACAG | TACTA | TACTT | TACTC | TACTG | TACCA | TACCT | TACCC | TACCG | TACGA | TACGT | TACGC | TACG  |
| AG  | TAGAA | TAGAT | TAGAC | TAGAG | TAGTA | TAGTT | TAGTC | TAGTG | TAGCA | TAGCT | TAGCC | TAGCG | TAGGA | TAGGT | TAGGC | TAGG  |
| ΓA  | TTAAA | TTAAT | TTAAC | TTAAG | TTATA | TTATT | TTATC | TTATG | TTACA | TTACT | TTACC | TTACG | TTAGA | TTAGT | TTAGC | TTAC  |
| TT  | TTTAA | TTTAT | TTTAC | TTTAG | TTTTA | TTTTT | TTTTC | TTTTG | TTTCA | TTTCT | TTTCC | TTTCG | TTTGA | TTTGT | TTTGC | TTTC  |
| ГC  | TTCAA | TTCAT | TTCAC | TTCAG | TTCTA | TTCTT | TTCTC | TTCTG | TTCCA | TTCCT | TTCCC | TTCCG | TTCGA | TTCGT | TTCGC | TTCC  |
| ΓG  | TTGAA | TTGAT | TTGAC | TTGAG | TTGTA | TTGTT | TTGTC | TTGTG | TTGCA | TTGCT | TTGCC | TTGCG | TTGGA | TTGGT | TTGGC | TTG   |
| CA  | TCAAA | TCAAT | TCAAC | TCAAG | TCATA | TCATT | TCATC | TCATG | TCACA | TCACT | TCACC | TCACG | TCAGA | TCAGT | TCAGC | TCAC  |
| CT  | TCTAA | TCTAT | TCTAC | TCTAG | TCTTA | TCTTT | TCTTC | TCTTG | TCTCA | TCTCT | TCTCC | TCTCG | TCTGA | TCTGT | TCTGC | TCTO  |
| CC  | TCCAA | TCCAT | TCCAC | TCCAG | TCCTA | TCCTT | TCCTC | TCCTG | TCCCA | TCCCT | TCCCC | TCCCG | TCCGA | TCCGT | TCCGC | TCCC  |
| CG  | TCGAA | TCGAT | TCGAC | TCGAG | TCGTA | TCGTT | TCGTC | TCGTG | TCGCA | TCGCT | TCGCC | TCGCG | TCGGA | TCGGT | TCGGC | TCGC  |
| GΑ  | TGAAA | TGAAT | TGAAC | TGAAG | TGATA | TGATT | TGATC | TGATG | TGACA | TGACT | TGACC | TGACG | TGAGA | TGAGT | TGAGC | TGAC  |
| ΞT  | TGTAA | TGTAT | TGTAC | TGTAG | TGTTA | TGTTT | TGTTC | TGTTG | TGTCA | TGTCT | TGTCC | TGTCG | TGTGA | TGTGT | TGTGC | TGTO  |
| ЭC  | TGCAA | TGCAT | TGCAC | TGCAG | TGCTA | TGCTT | TGCTC | TGCTG | TGCCA | TGCCT | TGCCC | TGCCG | TGCGA | TGCGT | TGCGC | TGCG  |
| GG  | TGGAA | TGGAT | TGGAC | TGGAG | TGGTA | TGGTT | TGGTC | TGGTG | TGGCA | TGGCT | TGGCC | TGGCG | TGGGA | TGGGT | TGGGC | TGGG  |
| AA  | CAAAA | CAAAT | CAAAC | CAAAG | CAATA | CAATT | CAATC | CAATG | CAACA | CAACT | CAACC | CAACG | CAAGA | CAAGT | CAAGC | CAAG  |
| ΑT  | CATAA | CATAT | CATAC | CATAG | CATTA | CATTT | CATTC | CATTG | CATCA | CATCT | CATCC | CATCG | CATGA | CATGT | CATGC | CATO  |
| AC  | CACAA | CACAT | CACAC | CACAG | CACTA | CACTT | CACTC | CACTG | CACCA | CACCT | CACCC | CACCG | CACGA | CACGT | CACGC | CACG  |
| AG  | CAGAA | CAGAT | CAGAC | CAGAG | CAGTA | CAGTT | CAGTC | CAGTG | CAGCA | CAGCT | CAGCC | CAGCG | CAGGA | CAGGT | CAGGC | CAG   |
| ΓA  | CTAAA | CTAAT | CTAAC | CTAAG | CTATA | CTATT | CTATC | CTATG | CTACA | CTACT | CTACC | CTACG | CTAGA | CTAGT | CTAGC | CTAC  |
| PΤ  | CTTAA | CTTAT | CTTAC | CTTAG | CTTTA | CTTTT | CTTTC | CTTTG | CTTCA | CTTCT | CTTCC | CTTCG | CTTGA | CTTGT | CTTGC | CTT   |
| PC  | CTCAA | CTCAT | CTCAC | CTCAG | CTCTA | CTCTT | CTCTC | CTCTG | CTCCA | CTCCT | CTCCC | CTCCG | CTCGA | CTCGT | CTCGC | CTCC  |
| PG  | CTGAA | CTGAT | CTGAC | CTGAG | CTGTA | CTGTT | CTGTC | CTGTG | CTGCA | CTGCT | CTGCC | CTGCG | CTGGA | CTGGT | CTGGC | CTG   |
| CA  | CCAAA | CCAAT | CCAAC | CCAAG | CCATA | CCATT | CCATC | CCATG | CCACA | CCACT | CCACC | CCACG | CCAGA | CCAGT | CCAGC | CCA   |
| T   | CCTAA | CCTAT | CCTAC | CCTAG | CCTTA | CCTTT | CCTTC | CCTTG | CCTCA | CCTCT | CCTCC | CCTCG | CCTGA | CCTGT | CCTGC | CCT   |
| CC  | CCCAA | CCCAT | CCCAC | CCCAG | CCCTA | CCCTT | CCCTC | CCCTG | CCCCA | CCCCT | ccccc | CCCCG | CCCGA | CCCGT | CCCGC | CCC   |
| CG  | CCGAA | CCGAT | CCGAC | CCGAG | CCGTA | CCGTT | CCGTC | CCGTG | CCGCA | CCGCT | CCGCC | CCGCG | CCGGA | CCGGT | CCGGC | CCG   |
| A   | CGAAA | CGAAT | CGAAC | CGAAG | CGATA | CGATT | CGATC | CGATG | CGACA | CGACT | CGACC | CGACG | CGAGA | CGAGT | CGAGC | CGA   |
| FT  | CGTAA | CGTAT | CGTAC | CGTAG | CGTTA | CGTTT | CGTTC | CGTTG | CGTCA | CGTCT | CGTCC | CGTCG | CGTGA | CGTGT | CGTGC | CGT   |
| C   | CGCAA | CGCAT | CGCAC | CGCAG | CGCTA | CGCTT | CGCTC | CGCTG | CGCCA | CGCCT | CGCCC | CGCCG | CGCGA | CGCGT | CGCGC | CGC   |
| G   | CGGAA | CGGAT | CGGAC | CGGAG |       | CGGTT | CGGTC | CGGTG | CGGCA | CGGCT | CGGCC | CGGCG | CGGGA | CGGGT | CGGGC | CGG   |
| A   | GAAAA | GAAAT | GAAAC | GAAAG |       | GAATT | GAATC | GAATG | GAACA | GAACT | GAACC | GAACG | GAAGA | GAAGT | GAAGC | GAA   |
| Т   | GATAA | GATAT | GATAC | GATAG | GATTA | GATTT | GATTC | GATTG | GATCA | GATCT | GATCC | GATCG | GATGA | GATGT | GATGC | GAT   |
| .C  | GACAA | GACAT | GACAC | GACAG | GACTA | GACTT | GACTC | GACTG | GACCA | GACCT | GACCC | GACCG | GACGA | GACGT | GACGC | GAC   |
| G   | GAGAA | GAGAT | GAGAC | GAGAG | GAGTA | GAGTT | GAGTC | GAGTG | GAGCA | GAGCT | GAGCC | GAGCG | GAGGA | GAGGT | GAGGC | GAG   |
| Ά   | GTAAA | GTAAT | GTAAC | GTAAG | GTATA | GTATT | GTATC | GTATG | GTACA | GTACT | GTACC | GTACG | GTAGA | GTAGT | GTAGC | GTA   |
| T   | GTTAA | GTTAT | GTTAC | GTTAG | GTTTA | GTTTT | GTTTC | GTTTG | GTTCA | GTTCT | GTTCC | GTTCG | GTTGA | GTTGT | GTTGC | GTT   |
| PC. | GTCAA | GTCAT | GTCAC | GTCAG | GTCTA | GTCTT | GTCTC | GTCTG | GTCCA | GTCCT | GTCCC | GTCCG | GTCGA | GTCGT | GTCGC | GTC   |
| G   | GTGAA | GTGAT | GTGAC | GTGAG | GTGTA | GTGTT | GTGTC | GTGTG | GTGCA | GTGCT | GTGCC | GTGCG | GTGGA | GTGGT | GTGGC | GTG   |
| Α   | GCAAA | GCAAT | GCAAC | GCAAG | GCATA | GCATT | GCATC | GCATG | GCACA | GCACT | GCACC | GCACG | GCAGA | GCAGT | GCAGC | GCA   |
| T   | GCTAA | GCTAT | GCTAC | GCTAG | GCTTA | GCTTT | GCTTC | GCTTG | GCTCA | GCTCT | GCTCC | GCTCG | GCTGA | GCTGT | GCTGC | GCT   |
| CC  | GCCAA | GCCAT | GCCAC | GCCAG | GCCTA | GCCTT | GCCTC | GCCTG | GCCCA | GCCCT | GCCCC | GCCCG | GCCGA | GCCGT | GCCGC | GCC   |
| CG  | GCGAA | GCGAT | GCGAC | GCGAG | GCGTA | GCGTT | GCGTC | GCGTG | GCGCA | GCGCT | GCGCC | GCGCG | GCGGA | GCGGT | GCGGC | GCG   |
| GΑ  | GGAAA | GGAAT | GGAAC | GGAAG | GGATA | GGATT | GGATC | GGATG | GGACA | GGACT | GGACC | GGACG | GGAGA | GGAGT | GGAGC | GGA   |
| FT  | GGTAA | GGTAT | GGTAC | GGTAG | GGTTA | GGTTT | GGTTC | GGTTG | GGTCA | GGTCT | GGTCC | GGTCG | GGTGA | GGTGT | GGTGC | GGT   |
| GC  | GGCAA | GGCAT | GGCAC | GGCAG | GGCTA | GGCTT | GGCTC | GGCTG | GGCCA | GGCCT | GGCCC | GGCCG | GGCGA | GGCGT | GGCGC | GGCC  |
|     | GGGAA |       |       |       | GGGTA | GGGTT | GGGTC | GGGTG | GGGCA | GGGCT | GGGCC | eeece | GGGGA | GGGGT | GGGGC | 0000  |