

SeqTrimNext

Statistics of pre-processing

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1 Output Files

SeqTrimNext provides several files, the most interesting ones are in the following directories:

- `output_files`
 - `output.less`, containing an extensive information about the trimming of each sequence. It can be visualised on terminal using the command `less -R`.
 - `used_params.txt`, containing the complete set of parameters used for execution of SeqTrimNext with your data
 - `rejected.txt`, containing a list of rejected sequences together with the reason for their removal.
 - `initial_stats.json`, containing statistics for raw sequences.
 - `stats.json`, containing the statistics of the cleaning process.
 - There is a collection of `folders` that gather sequences with the same MID; each folder contains a `sequences` file (in FASTQ format) with useful reads. There may also exist a file with reads containing low complexity regions. If you want to reconstruct a SFF with the useful segment of each pre-processed read, use `sff_info` file in combination with the original SFF file for the `sfffile` tool.
- `graphs`
 - `size_stats.png`, a graph with the distribution of read lengths in raw data (see Fig. ??).
 - `qualities.png`, a graph to inspect read qualities in raw data (see Fig. ??).
 - `PluginExtractInserts_insert_size.png`, a graph with the distribution of read lengths after SeqTrimNext pre-processing (see Fig. 1).
 - There are other graphs (mostly bar plots) that illustrate the quality of pre-processed reads. All are in PNG format.
- `latex`
 - It is provided as a compressed file `latex.zip` containing all “`.tex`” files required to compile this document. Graphs are taken from the `graph` folder

2 Relevant parameters

In this section, the relevant parameters used in your experiment are shown. Full information about the parameters can be obtained from file `used_params.txt`

2.1 General

Plugins applied to every sequence, separated by commas. Order is important

1. PluginIndeterminations
2. PluginFindPolyAt
3. PluginAbAdapters
4. PluginUserContaminants
5. PluginContaminants
6. PluginVectors
7. PluginLowQuality
8. PluginLowComplexity
9. PluginExtractInserts

Remove duplicated (clonal) sequences (using CD-HIT 454)

```
remove_clonality: false
```

Minimum insert size for every trimmed sequence

```
min_insert_size_trimmed: 30
```

Minimum insert size for each end of paired-end reads; true paired-ends have both single-ends longer than this value

```
min_insert_size_paired: 40
```

Seqtrim version

```
seqtrim_version: 2.0.67
```

```
min_sequence_size_raw:
```

2.2 Quality

Minimum quality value for every nucleotide

```
min_quality: 20
```

```
window_width:
```

2.3 Contaminants

Blast E-value used as cut-off when searching for contaminations

```
blast_evalue_contaminants: 1.0e-10
```

Minimum required identity (%) for a reliable contamination

```
blast_percent_contaminants: 85
```

Minimum hit size (nt) for considering a true contamination

```
min_contam_seq_presence: 40
```

Genus of input data: contaminations belonging to this genus will be ignored

```
genus:
```

Is a contamination considered a source of sequence rejection? (setting to false will only trim contaminated sequences instead of rejecting the complete read)

```
contaminants_reject: true
Path for contaminants database
    contaminants.fasta
    cont_ribosome.fasta
```

3 Pre-processing statistics

Next figure is equivalent to Figure ?? but using output reads (useful sequences). The mode is expected to decrease but the shape of the plot should be similar.

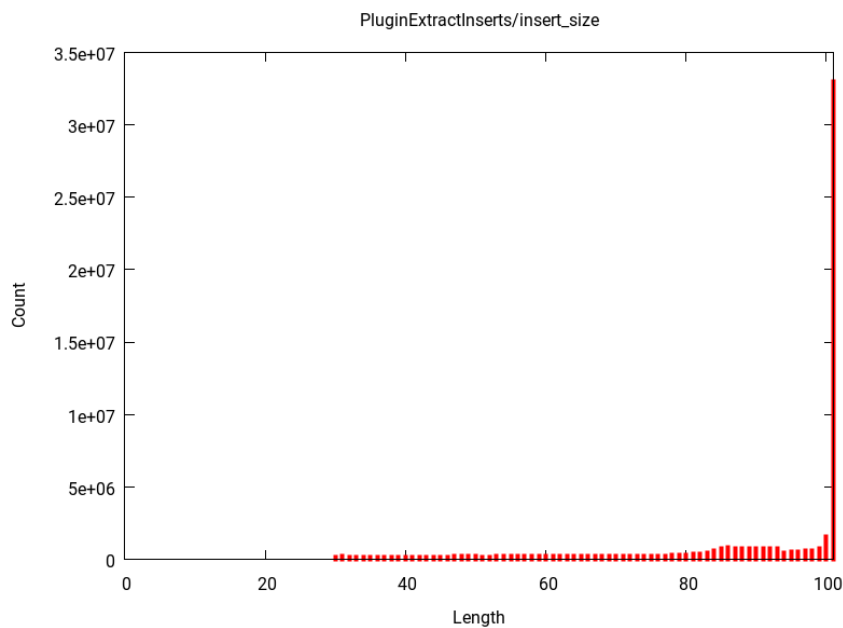


Figure 1: Size distribution of the output sequences. Short sequences ($< \text{min_insert_size_trimmed}$) were removed. [PluginExtractInserts_insert_size.png]

Summary statistics of the SeqTrimNext analysis. Be careful and read all warnings that are indicating concerns about your data. In the files `initial_stats.json` and `stats.json` can be found a full statistics of your data and SeqTrimNext pre-processing

| | | |
|-----------------|----------------------|----------|
| Input reads: | total | 67494936 |
| | Smallest read (bp) | 101 |
| | Largest read (bp) | 101 |
| | Mode (bp) | 0 |
| | Mean (bp) | 0.0 |
| Output results: | total | 6474133 |
| | Rejected | 10556491 |
| | Low complexity reads | 111246 |
| | Mode (bp) | 91 |
| | Mean (bp) | 90.6 |
| | Output paired reads | 50353066 |
| | Total output reads | 56827199 |
| Linkers: | | |

Table 1: List of the most frequent Vectors found among your reads

| Vectors | sequences |
|---|-----------|
| Cloning vector pKOHPR7 complete sequence. | 396408 |
| Cloning vector pAAV-MCS, complete sequence. | 388393 |
| Enterobacteria phage lambda | 102700 |
| Cloning vector pVLH/hsp | 37094 |
| Simian virus 40 | 32216 |

Table 2: List of the most frequent Adapters found among your reads

| Adapters | sequences |
|--------------------------------|-----------|
| ABISolid3_Adapter_A | 191444 |
| TruSeq_Universal_Adapter | 164411 |
| ABISolid3_GAPDH_Reverse_Primer | 153602 |
| ABISolid3_GAPDH_Forward_Primer | 132151 |
| Illumina_Single_End_Adapter_1 | 129137 |

Table 3: List of the most frequent Contaminants found among your reads

| Contaminants | sequences |
|---|-----------|
| rRNA_small_subunit_Metazoa_Myotis | 64915 |
| rRNA_long_subunit_Metazoa_Dasytus | 62040 |
| Saccharomyces cerevisiae S288c chromosome XII, complete sequence | 60803 |
| Schizosaccharomyces pombe 972h- chromosome III, complete sequence | 41303 |
| Aspergillus niger CBS 513.88 clone An03 | 34796 |

Table 4: Summary of nucleotides removed in every plugin.

| Plugin | Nucleotides | Percent | Warnings |
|------------------|-------------|---------|----------|
| Low Quality | 1066240942 | Inf % | OK |
| Low Complexity | 54442575 | Inf % | OK |
| Poly T | 27650081 | Inf % | OK |
| Poly A | 27184263 | Inf % | OK |
| Contaminants | 42281967 | Inf % | OK |
| Adapters | 61844082 | Inf % | OK |
| Vectors | 43109050 | Inf % | OK |
| Indeterminations | 167394222 | Inf % | OK |
| Inserts | 5160101163 | Inf % | iW1 |

iW1 Warning!, only Inf % of nucleotides are useful

4 Rejected reads

| | |
|--------------------------|----------|
| Input sequences | 67494936 |
| Output sequences | 6474133 |
| Rejected sequences | 10556491 |
| Output paired sequences | 50353066 |
| Total output sequences | 56827199 |
| Low complexity sequences | 111246 |

Table 5: Summary of reads removed in every plugin.

| Case | Number of sequences | Percent | Warnings |
|-------------------|---------------------|----------|----------|
| | 10556491 | 15.640 % | OK |
| Short inserts | 5894291 | 8.733 % | rdW2 |
| Empty Inserts | 2580836 | 3.824 % | rdW3 |
| No Valid Inserts | 1606649 | 2.380 % | rdW5 |
| Contaminants | 453635 | 0.672 % | OK |
| Indeterminations | 14952 | 0.022 % | OK |
| Low Complexity | 6036 | 0.009 % | OK |
| Unexpected Vector | 92 | 0.000 % | OK |
| Total rejected | 10556491 | 15.640 % | OK |

rdW2 Warning!, a 8.733 % of your sequences are too short

rdW3 Warning!, a 3.824 % of your sequences are empty (without an insert)

rdW5 Warning!, a 2.380 % of your sequences are no valid sequences

References

- [1] Falgueras et al. SeqTrim: a high-throughput pipeline for preprocessing any type of sequence reads. *BMC Bioinformatics* 11:38 (2010)
- [2] Weizhong Li & Adam Godzik. Cd-hit: a fast program for clustering and comparing large sets of protein or nucleotide sequences. *Bioinformatics* (2006) 22:1658-9

Thanks you for use SeqTrimNext! Send us any comment to scbi support