

# Generate DNA Element

Generates random DNA sequences with given nucleotide content that can be specified manually or evaluated from the reference file.

Element type: generate-dna

## Parameters

| Parameter   | Description                                                                                                                                                                                                                                                      | Default value | Parameter in Workflow File | Type                                                                                                               |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|--------------------------------------------------------------------------------------------------------------------|
| Length      | Length of the resulted sequence or sequences.                                                                                                                                                                                                                    | 1000 bp       | length                     | numeric                                                                                                            |
| Count       | Number of sequences to generate.                                                                                                                                                                                                                                 | 1             | count                      | numeric                                                                                                            |
| Seed        | Value to initialize the random generator. By default (seed = -1) the generator is initialized with the system time.                                                                                                                                              | -1            | seed                       | numeric                                                                                                            |
| Content     | Specifies how the nucleotide content of the sequence(s) should be generated. It can be either taken from the reference file (see the <i>Reference</i> parameter), or input manually.                                                                             | manual        | content                    | string                                                                                                             |
| Algorithm   | Algorithm for generating random sequence(s). Two algorithms are available: GC Content and GC Skew. If you choose GC Content, then parameters A, C, G, T are used to generate the sequence. Otherwise, the GC Skew parameter is used to generate the sequence(s). | GC Content    | algorithm                  | string<br><br>Available values are: <ul style="list-style-type: none"><li>gc - content</li><li>gc - skew</li></ul> |
| Window size | The DNA sequence generation is divided into windows of the specified size. In each window the bases ratio, defined by other parameters, is kept.                                                                                                                 | 1000          | window-size                | numeric                                                                                                            |
| Reference   | Path to the reference file (could be a sequence or an alignment).                                                                                                                                                                                                |               | reference-url              | string<br><br>Available values are: <ul style="list-style-type: none"><li>manual</li><li>reference</li></ul>       |
| A           | Adenine content.                                                                                                                                                                                                                                                 | 25%           | percent-a                  | numeric                                                                                                            |
| C           | Cytosine content.                                                                                                                                                                                                                                                | 25%           | percent-c                  | numeric                                                                                                            |
| G           | Guanine content.                                                                                                                                                                                                                                                 | 25%           | percent-g                  | numeric                                                                                                            |
| T           | Thymine content.                                                                                                                                                                                                                                                 | 25%           | percent-t                  | numeric                                                                                                            |
| GC Skew     | GC Skew is calculated as $(G - C) / (G + C)$ , where G is the number of G's in the window, and C is the number of C's.                                                                                                                                           | 0.25          | gc-skew                    | numeric                                                                                                            |

## Input/Output Ports

The element has 1 *output port*:

Name in GUI: Sequences

Name in Workflow File: out-sequence

Slots:

| Slot In GUI | Slot in Workflow File | Type     |
|-------------|-----------------------|----------|
| Sequence    | sequence              | sequence |