

## 3.2 - Starting the Flux Simulator

### Start Command

The Flux Simulator provides a wrapper script to launch the program from predominant shell interpreters of major platforms.

|                       |                                |                  |                                                     |
|-----------------------|--------------------------------|------------------|-----------------------------------------------------|
| shell<br>(Linux/Unix) | <code>\$ flux-simulator</code> | cmd<br>(Windows) | <code>C:\&gt;flux-simulator.bat -t simulator</code> |
|-----------------------|--------------------------------|------------------|-----------------------------------------------------|

When started without parameters, the Flux Simulator provides a list of command line flags that can be provided when starting the program.

```
[INFO] I am the Flux Toolbox (v1.0-SNAPSHOT build 1), nice to meet you!
[ERROR]
[ERROR] No parameter file specified !
[ERROR]
[USAGE]
simulator -p <file> [-l] [-o] [-s] [-x]
[DESCRIPTION]
Flux Simulation Pipeline
[OPTIONS]
  -p --parameter      <file> specify parameter file (PAR file)
  -l --library         simulate library construction
  -o --printParameters Print default parameters
  -s --sequence        simulate sequencing
  -x --express         simulate expression
```

### Parameter

As can be seen by the default output above, the Flux Simulator requires a parameter file to be specified by the command line flag "-p". A parameter file contains a list of parameter/value pairs, one per line and separated from each other by white spaces. An overview of parameters that can be contained in the parameter file with explanations and their respective default values is output with the flag "-o".

```
$ flux-simulator -o
[INFO] I am the Flux Toolbox (v1.0-SNAPSHOT build 1), nice to meet you!

# GTF reference file
#
REF_FILE_NAME

# exponent of power-law underlying the expression profile
#
# number default: -0.6
EXPRESSION_K      -0.6

#...
```

The remaining command line flags "-x", "-l", and "-s" are to specify which steps of the simulation pipeline described in the parameter file are to be carried out: simulated expression of a random transcriptome ("-x"), simulated library construction ("-l"), and/or simulated sequencing ("-s"). The next section introduces the pre-requirements, the algorithms, and the parameters for each pipeline step.