Analyzing a hematopoietic genetic network

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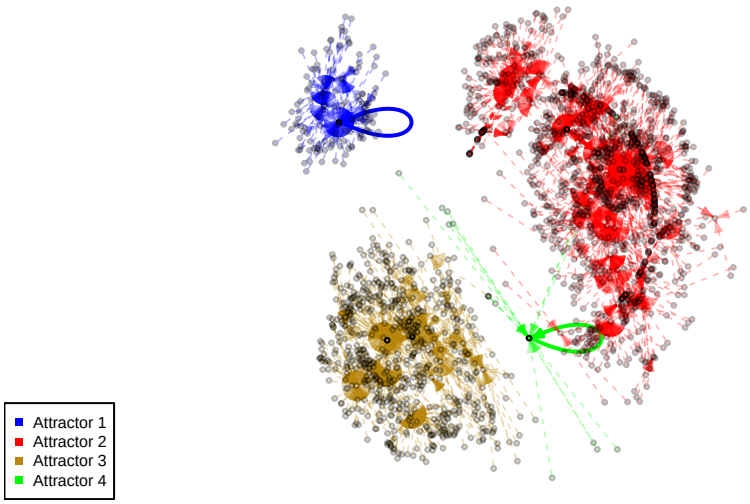
2024-06-03

```
attr <- getAttractors(HSC)
plotStateGraph(attr)
```




```
print(attr)
```

```
## Attractor 1 is a simple attractor consisting of 1 state(s) and has a basin of 134 state(s):
##
##  |--<----------|
##  V             |
##  00000000000   |
##  V             |
##  |-->----------|
##
```

```
##
## Genes are encoded in the following order: Erg Eto2 Fli1 Gata1 Gata2 Hhex Pu1 Runx1 Scl Smad6 Zfpm1
##
## Attractor 2 is a simple attractor consisting of 1 state(s) and has a basin of 16 state(s):
##
##  |--<----------|
##  V             |
##  00010000100   |
##  V             |
##  |-->----------|
##
##
## Genes are encoded in the following order: Erg Eto2 Fli1 Gata1 Gata2 Hhex Pu1 Runx1 Scl Smad6 Zfpm1
##
## Attractor 3 is a simple attractor consisting of 2 state(s) and has a basin of 1258 state(s):
##
##  |--<----------|
##  V             |
##  00101111110   |
##  11100110111   |
##  V             |
##  |-->----------|
##
##
## Genes are encoded in the following order: Erg Eto2 Fli1 Gata1 Gata2 Hhex Pu1 Runx1 Scl Smad6 Zfpm1
##
## Attractor 4 is a simple attractor consisting of 2 state(s) and has a basin of 640 state(s):
##
##  |--<----------|
##  V             |
##  00101110110   |
##  11100111111   |
##  V             |
##  |-->----------|
##
##
## Genes are encoded in the following order: Erg Eto2 Fli1 Gata1 Gata2 Hhex Pu1 Runx1 Scl Smad6 Zfpm1
```

Attractor 4 is the one that is closest to the experimental HSPC expression profile 11101111111 - 11100111111(Attractor 4)

```
attr <- getAttractors(HSC, type="asynchronous",
method="random", startStates=500)
print(str(attr))
```

```
## Dotted pair list of 2
##  $ stateInfo :List of 2
##   ..$ genes     : chr [1:11] "Erg" "Eto2" "Fli1" "Gata1" ...
##   ..$ fixedGenes: Named num [1:11] -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 ...
##   .. ..- attr(*, "names")= chr [1:11] "Erg" "Eto2" "Fli1" "Gata1" ...
##  $ attractors:List of 3
##   ..$ :Dotted pair list of 2
##   .. ..$ involvedStates: int [1, 1] 0
```

```
##   .. ..$ basinSize     : logi NA
##   ..$ :Dotted pair list of 2
##   .. ..$ involvedStates: int [1, 1] 264
##   .. ..$ basinSize     : logi NA
##   ..$ :Dotted pair list of 4
##   .. ..$ involvedStates: int [1, 1:32] 868 869 870 871 884 885 886 887 996 997 ...
##   .. ..$ basinSize     : logi NA
##   .. ..$ initialStates : int [1, 1:112] 2039 2039 2039 2038 2038 2037 2037 2037 2036 2036 ...
##   .. ..$ nextStates    : int [1, 1:112] 1911 2023 2038 1910 2022 1909 2021 2039 1908 2020 ...
##  - attr(*, "class")= chr "AttractorInfo"
## NULL
```

```
# Write attractors to an Excel file
#write.csv(attr, "attractors_output.csv")
```

Attractor 3 appears to be an assynchronous attractor because it is a complex/loose attractor