

# Essential genes in WT insights

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## Title:14012020-Mapping essential genes in WT and getting insights from it.

### Date

14012020

### Objective

To analyze and get some insights from the essential genes in WT. Useful questions:

- How many essential genes in WT are also bem1 interactors?
- How many essential genes in WT are also bem1 synthetic lethals?
- What is the dependency of the number of synthetic lethals of specif gene with the fitness of a knockout cell from that gene.

### Method

- I mainly used for this analysis the software Tableau under an academic license, for free.
- This software is handy to quickly inspect a difficult dataset with many dimensions and variables.

## Results

- The list of essential genes I downloaded from Here. Essentially it consists of 1110 genes , around 20% of yeast genome , measured in rich media for *Saccharomyces cerevisiae*.
  - The reference of the study is this paper from 2002, called: *Functional profiling of the Saccharomyces cerevisiae genome*.

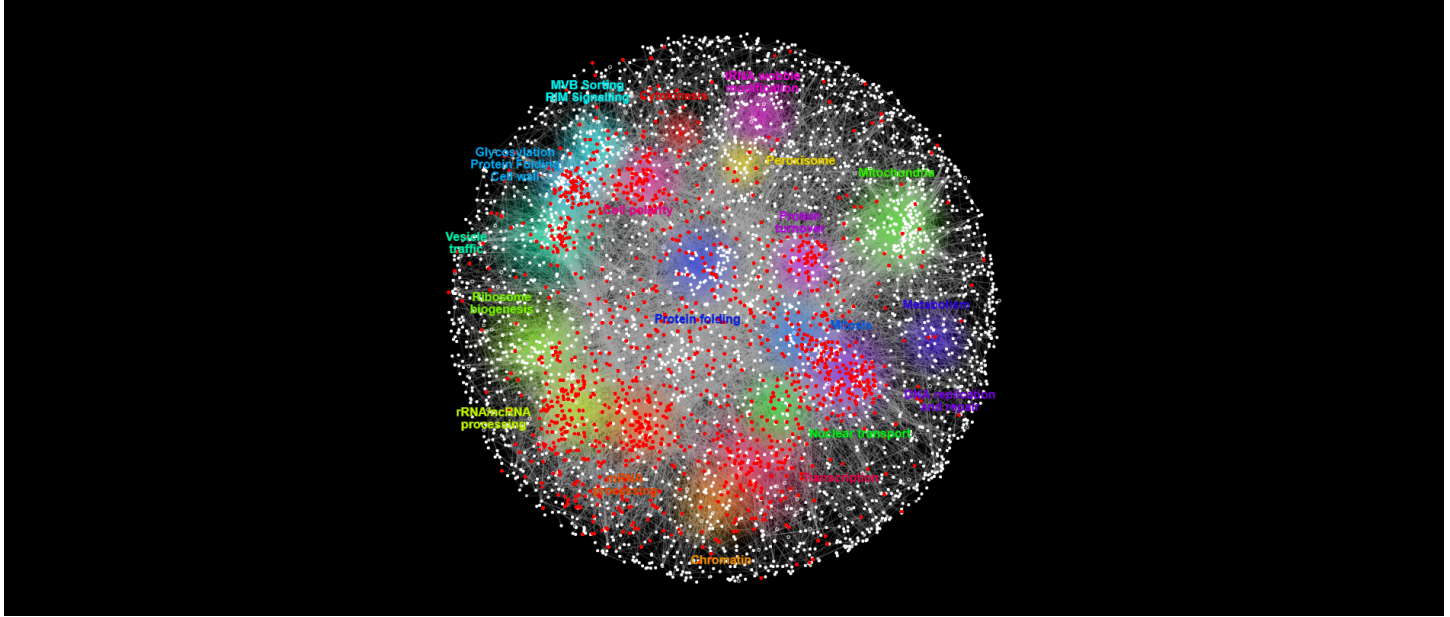


Figure 1: Essential genes on the yeast genetic interaction map

- How many essential genes in WT are also bem1 interactors?

34 genes out of 321 bem1 interactors genes are also essential in WT. This represents the 3% of all essential genes in WT interacts with Bem1.

- Bem1 synthetic lethals mapping -38 genes

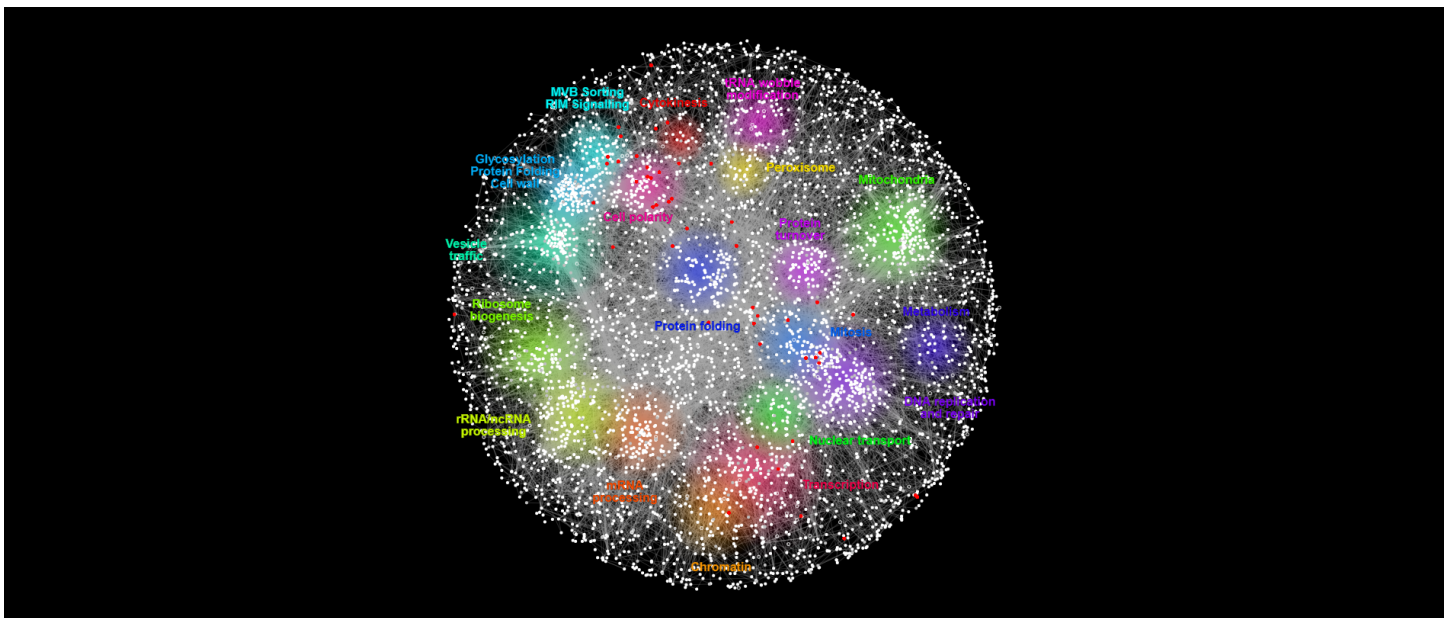


Figure 2: mapping of synthetic lethals genes of Bem1

- Insight 2: 13 genes out of 38 bem1 synthetic lethals are also WT essential genes ( $\sim 1/3$  of them). ***This means that 15 synthetic lethals genes of bem1 have gained essentiality in this background.***

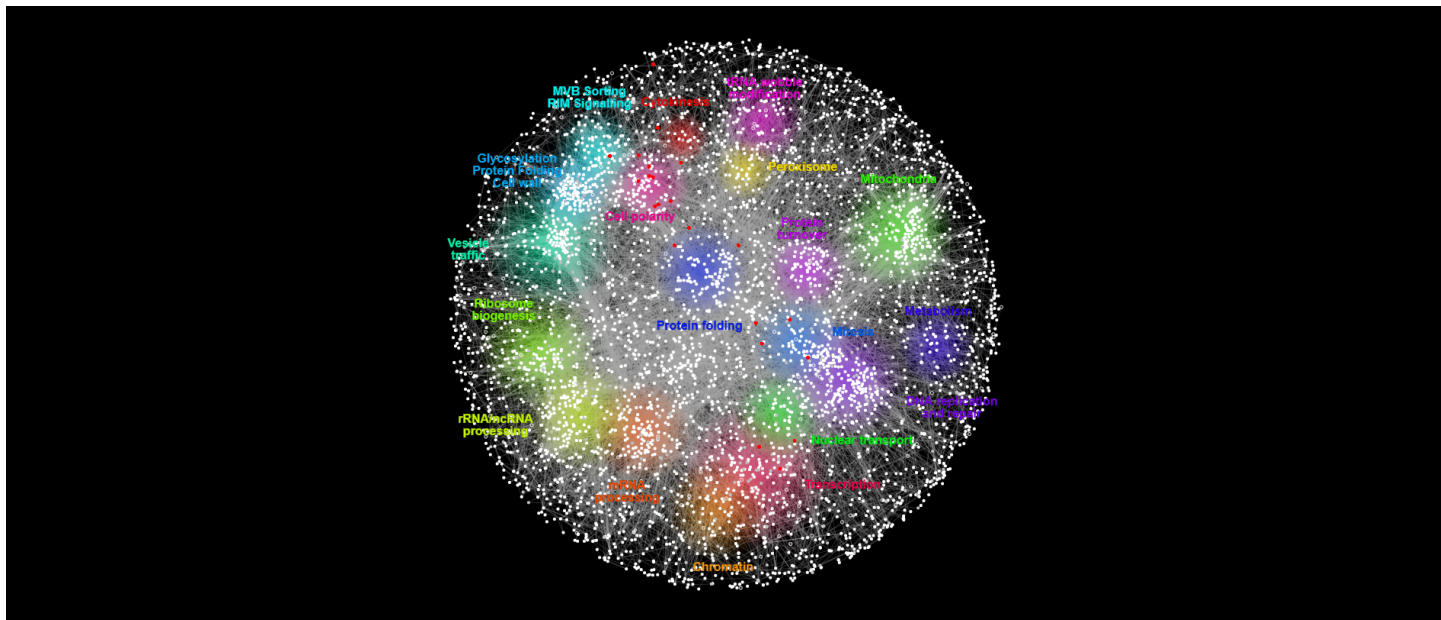


Figure 3: Essential genes that are also Bem1 synthetic lethals

- In dbem1 background some essential genes from WT background losses their essentiality(21/34), others gain essentiality (15/38), and other remains essential in both backgrounds(13=intersection of 34 essential genes and 38 bem1 synthetic lethals).