



Странные гены в оперонах рибосомных белков

Alien genes in ribosomal protein operons

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Abstract

Operons are typical for bacterial genomes. Ribosomal protein operons are among the most conserved ones. They are known to contain some alien genes not related to the process of translation. Here we investigate these genes and the evolution of their relations to ribosomal protein genes.

Гены в бактериальных геномах часто собраны в опероны. Опероны рибосомных белков являются одними из самых консервативных. Иногда они содержат «странные» гены, которые не участвуют в процессах трансляции. Мы изучали эти гены и эволюцию их отношений с генами рибосомных белков.

To do (further research)

- Study rare alien genes
- Study non-ribosomal neighbors of alien genes
- Confirm absence of parallel events with singletons as well
- Analyze functions of alien genes

Results

Materials and Methods

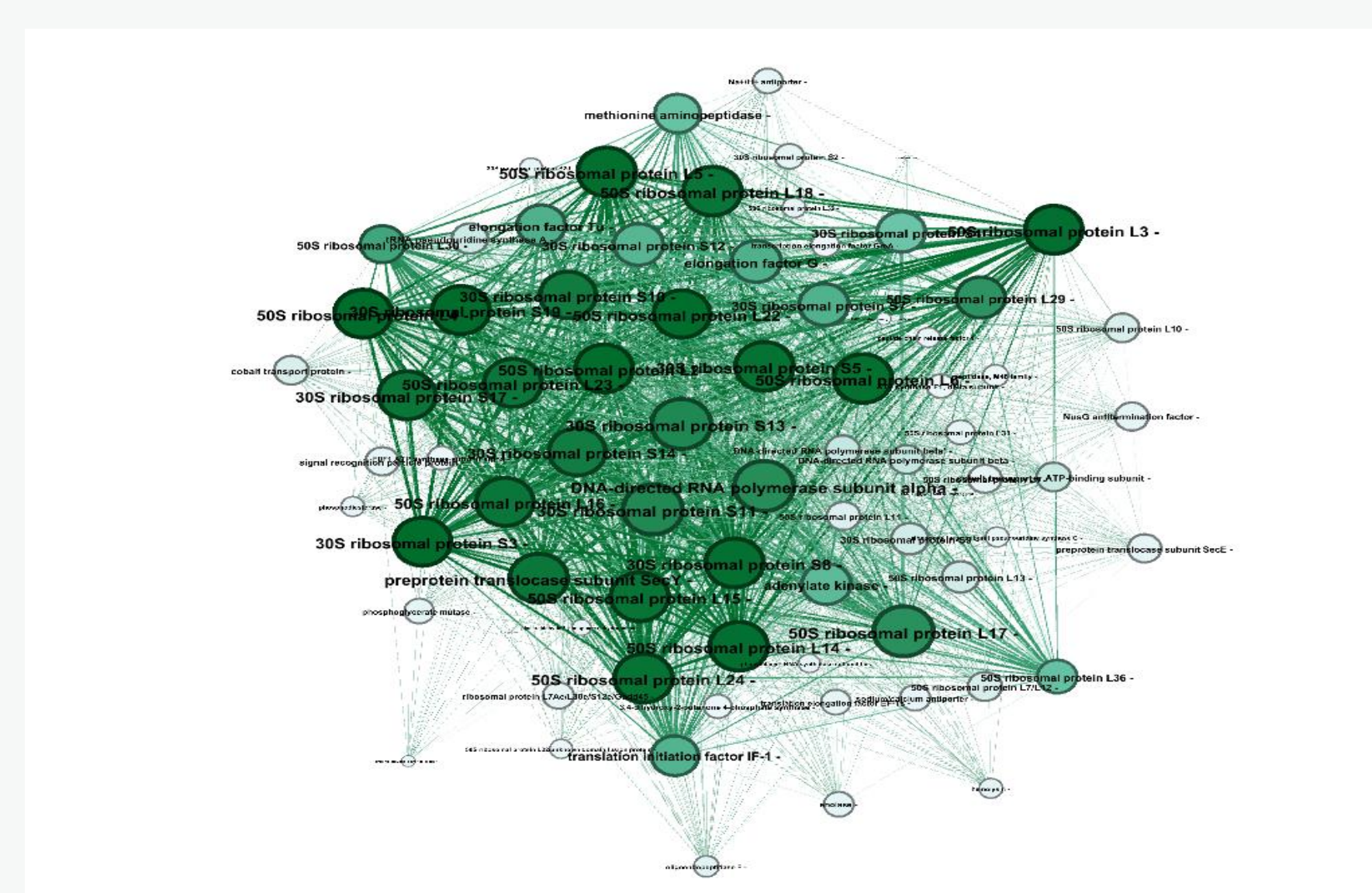


Figure 1. Graph of relations between genes before setting a threshold on weights. Граф отношений между генами до установки порога весов.

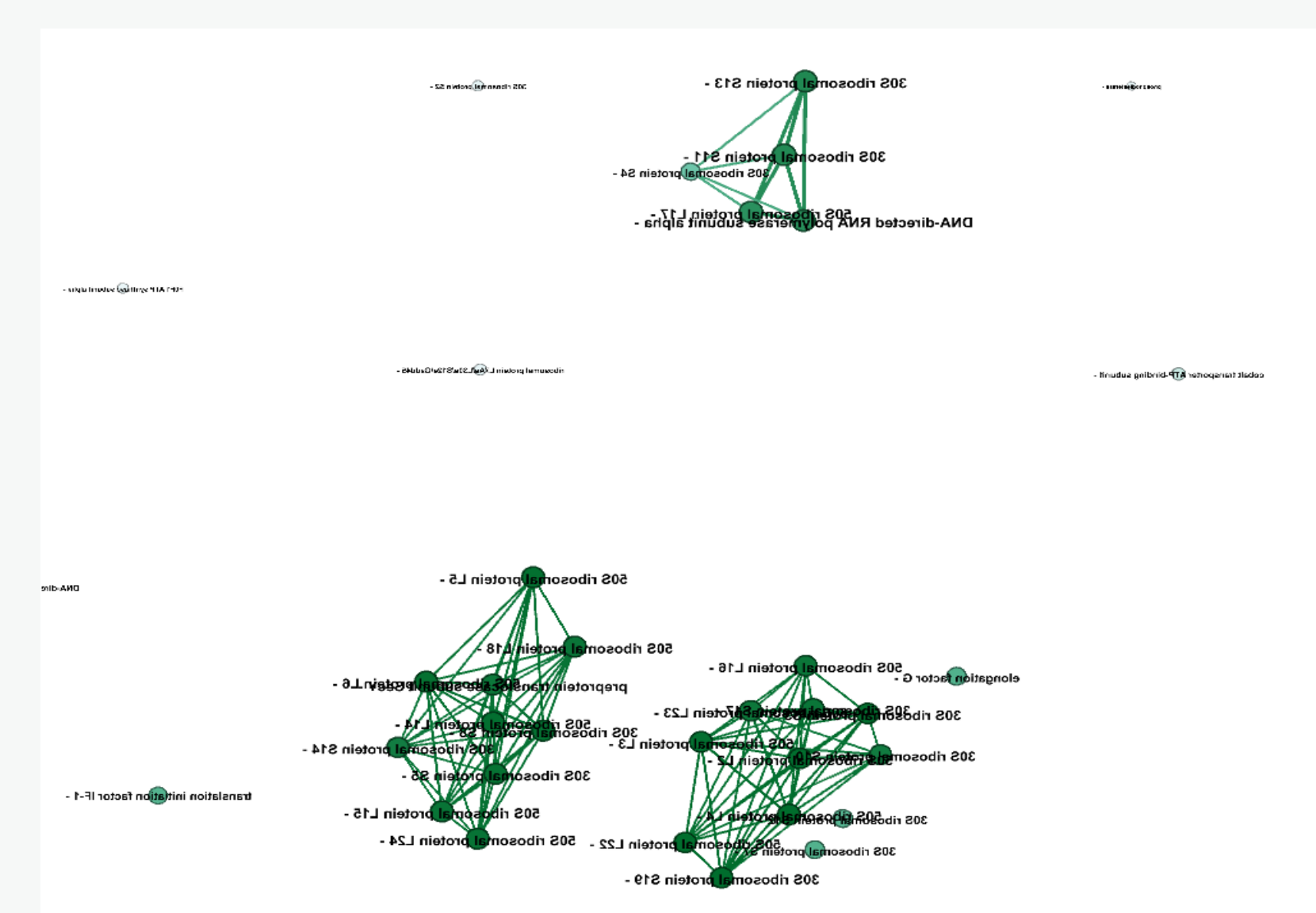


Figure 1. Graph of relations between genes after setting a threshold on weights. Граф отношений между генами после установки порога весов.

- Data on operons were downloaded from the database “DOOR”.
- The graph of genes was constructed as follows: two genes were connected by an edge if they occur in one operon. The width of each edge is proportional to the number of genomes where the two genes are in one operon (Scripts in Python).
- The graph was visualized using Gephi (fig 1).
- The graph was decomposed using different thresholds. We have selected the minimal threshold yielding several distinct clusters (fig 2).
- Several most frequent alien genes were selected. We studied the evolutionary history of their rearrangements using the IToL web-service.

