

Nonspecific binding limits the number of proteins in a cell and shapes their interaction networks

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- Motivation/observation: there seems to be an upper limit on the number of protein coding genes in an organism and there is little correlation between the number and the complexity of the organism.
- Methods: simulate protein interaction networks with discrete approximations of protein binding surfaces.
- As the number of unique proteins increases the minimum energy gap between specific and non-specific binding decreases.
- Simple explanation for an upper limit on proteome size based on the increase in non-specific bonding with the increase in proteins.
- Increased complexity is achieved by increasing the network complexity (connectivity) rather than number proteins.

