Data integration in systems biology: characterization of biological phenomena from structural and functional information

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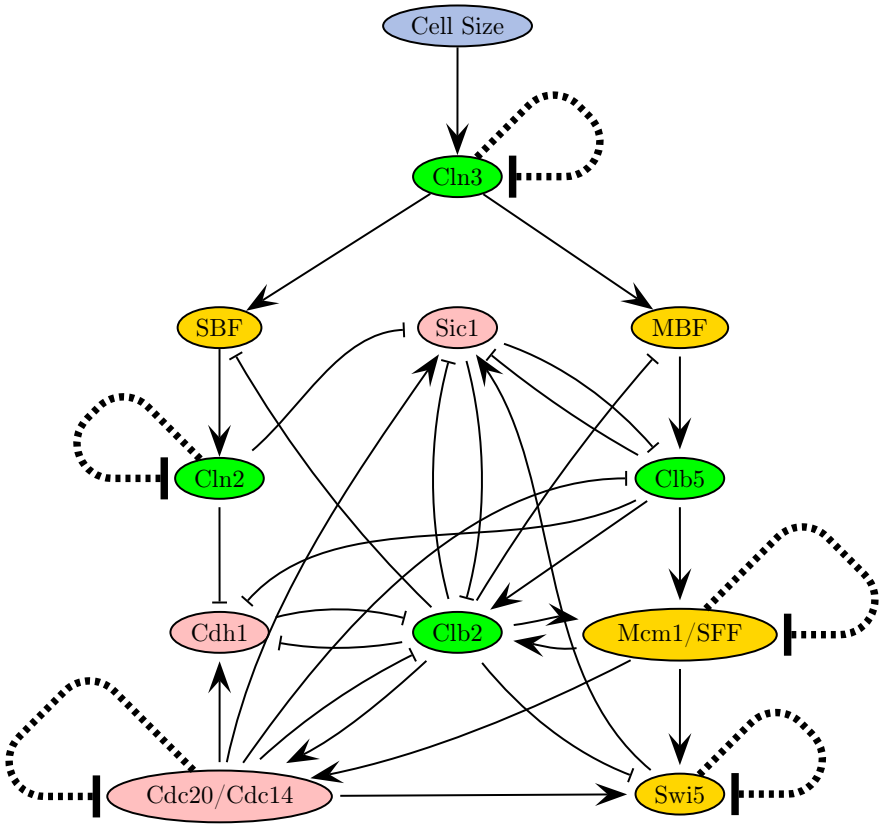
Project MSR-FAPESP 2011-2013

Summary

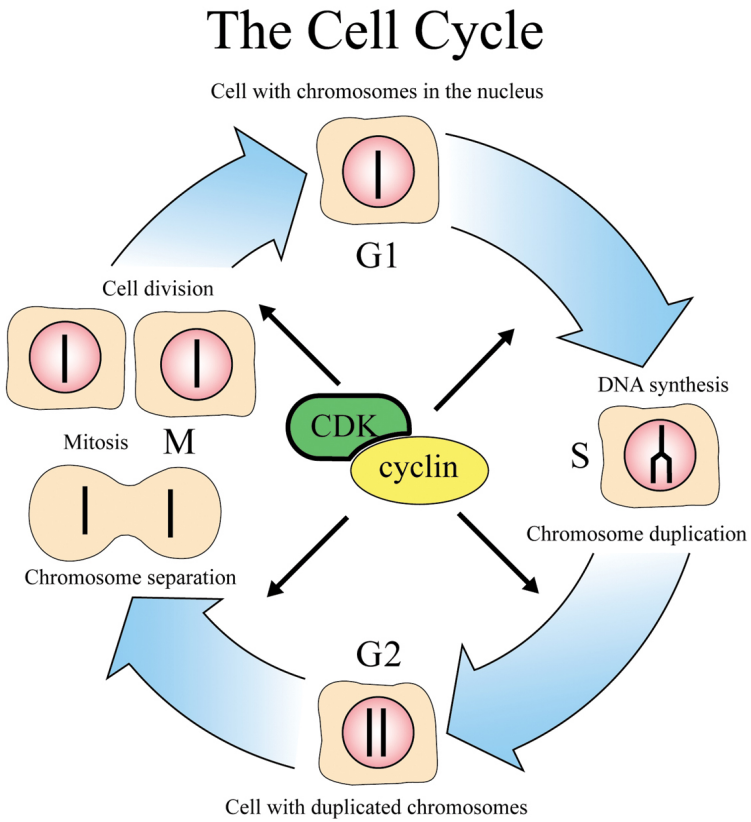
- Motivation
- Our Approach
- Domain Partners
- Research Team

Motivation

Biological Molecules Interactions

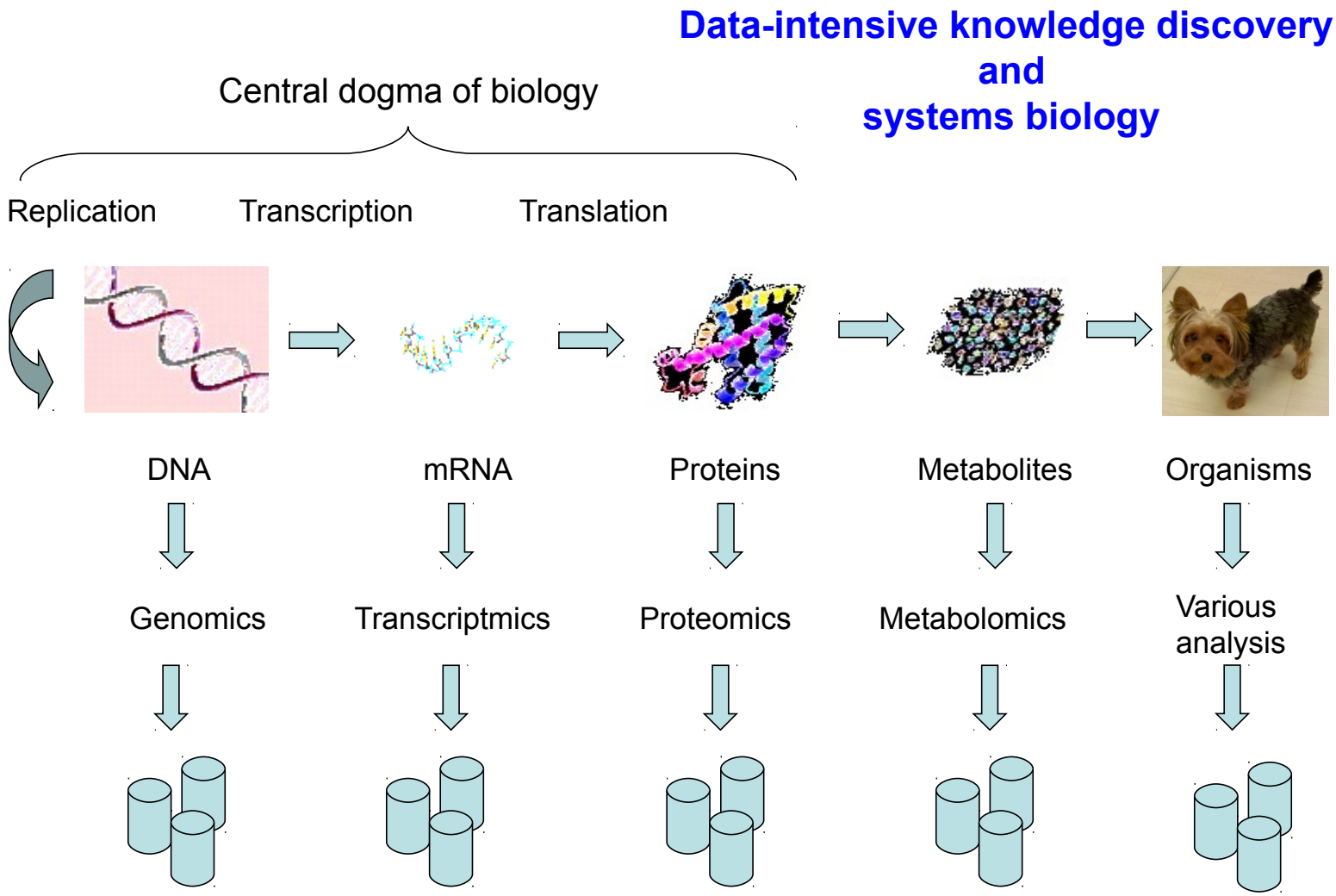


Li et al. PNAS 2004.



http://nobelprize.org/nobel_prizes/medicine/laureates/2001/press.html

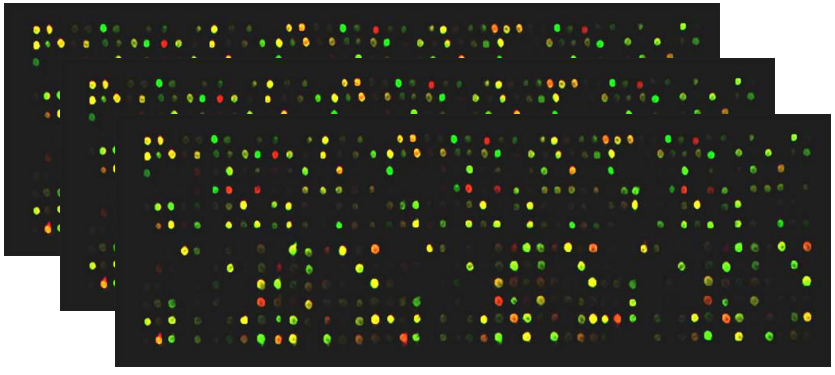
Cell Activity to Data Sets



Our Approach

Steps for Gene Regulatory Network Inference

Set of Microarrays



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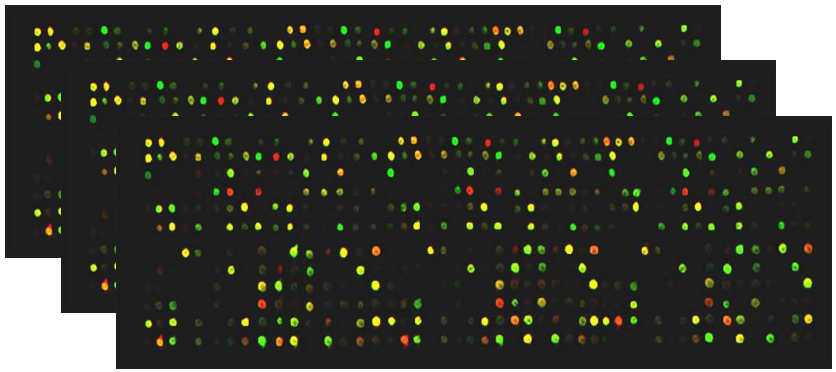
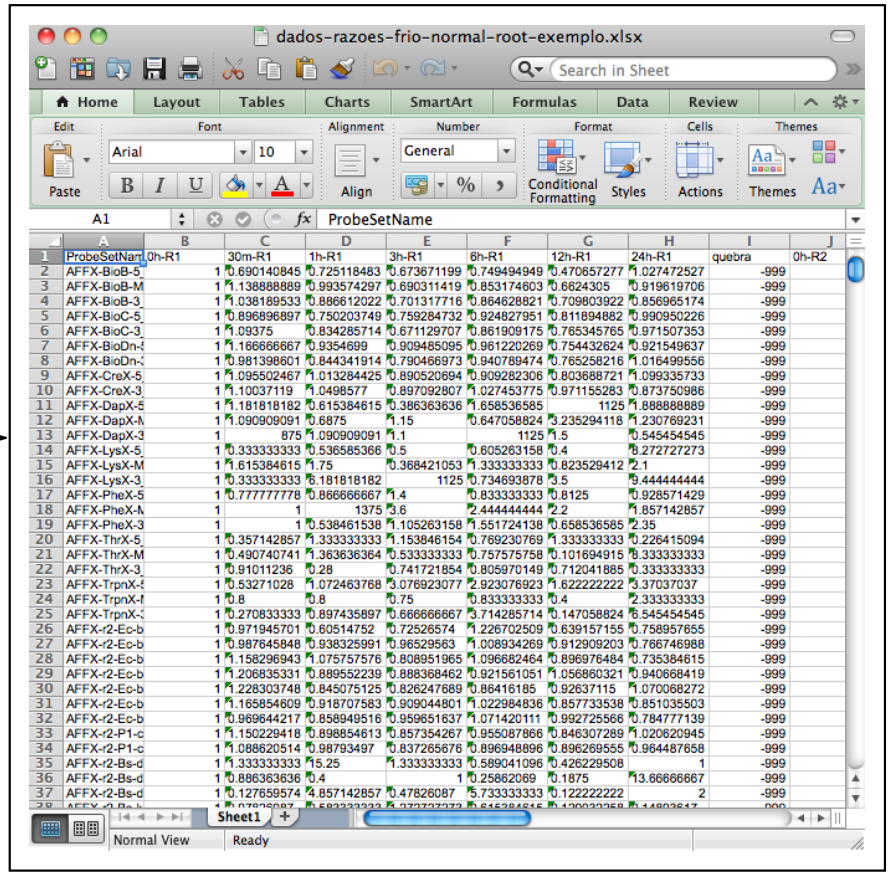
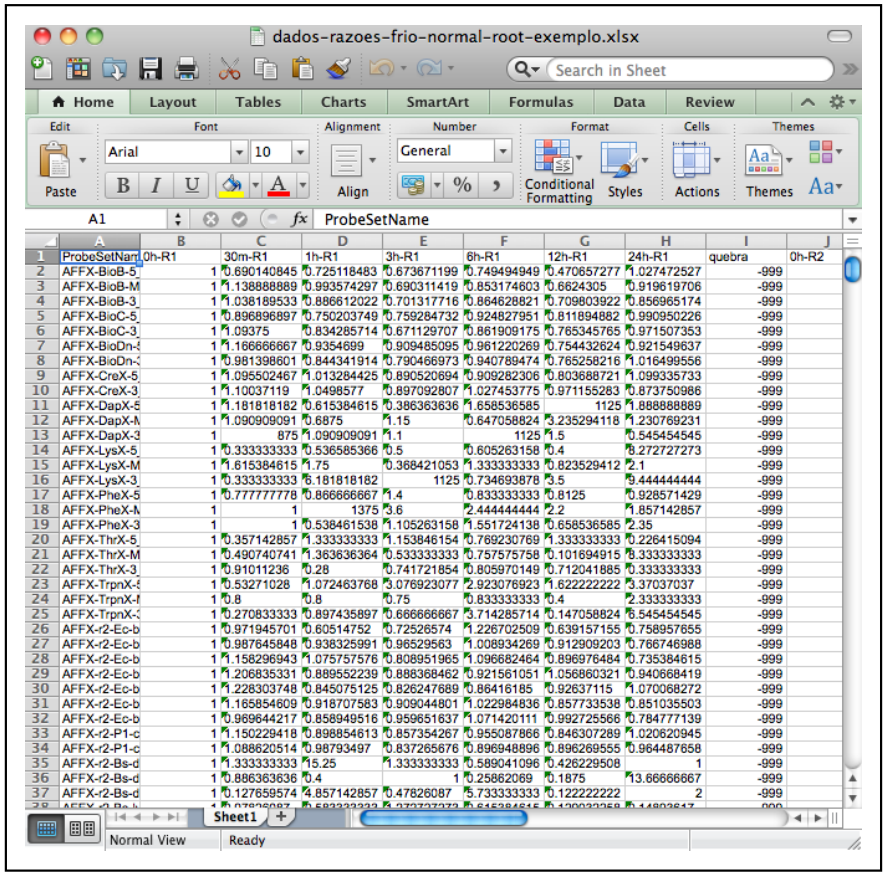




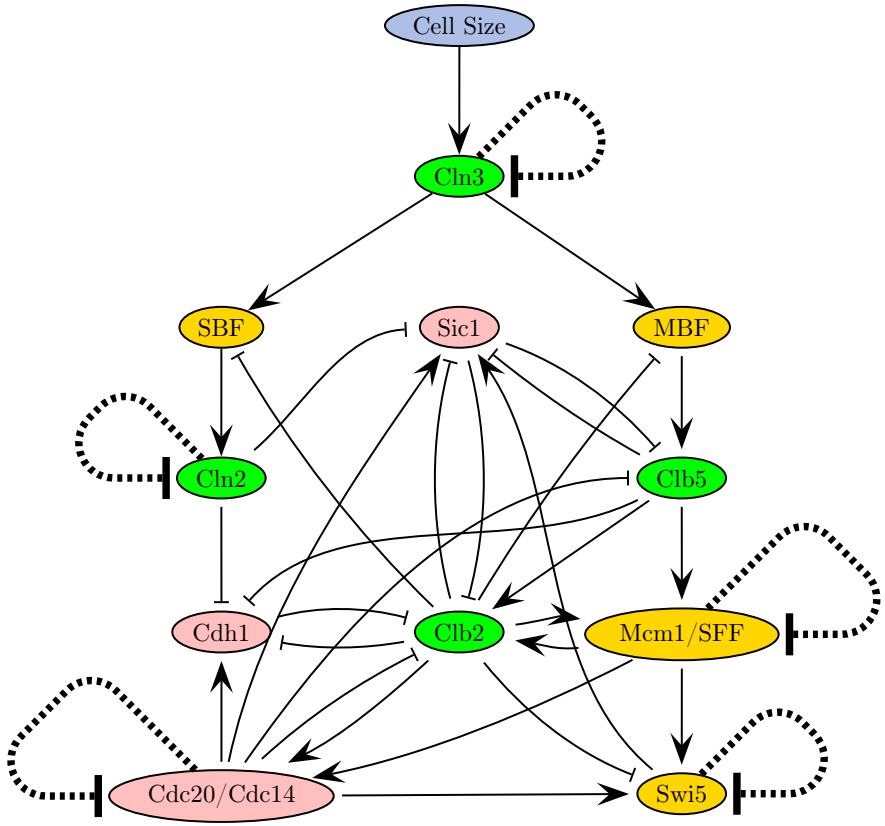
Steps for Gene Regulatory Network Inference



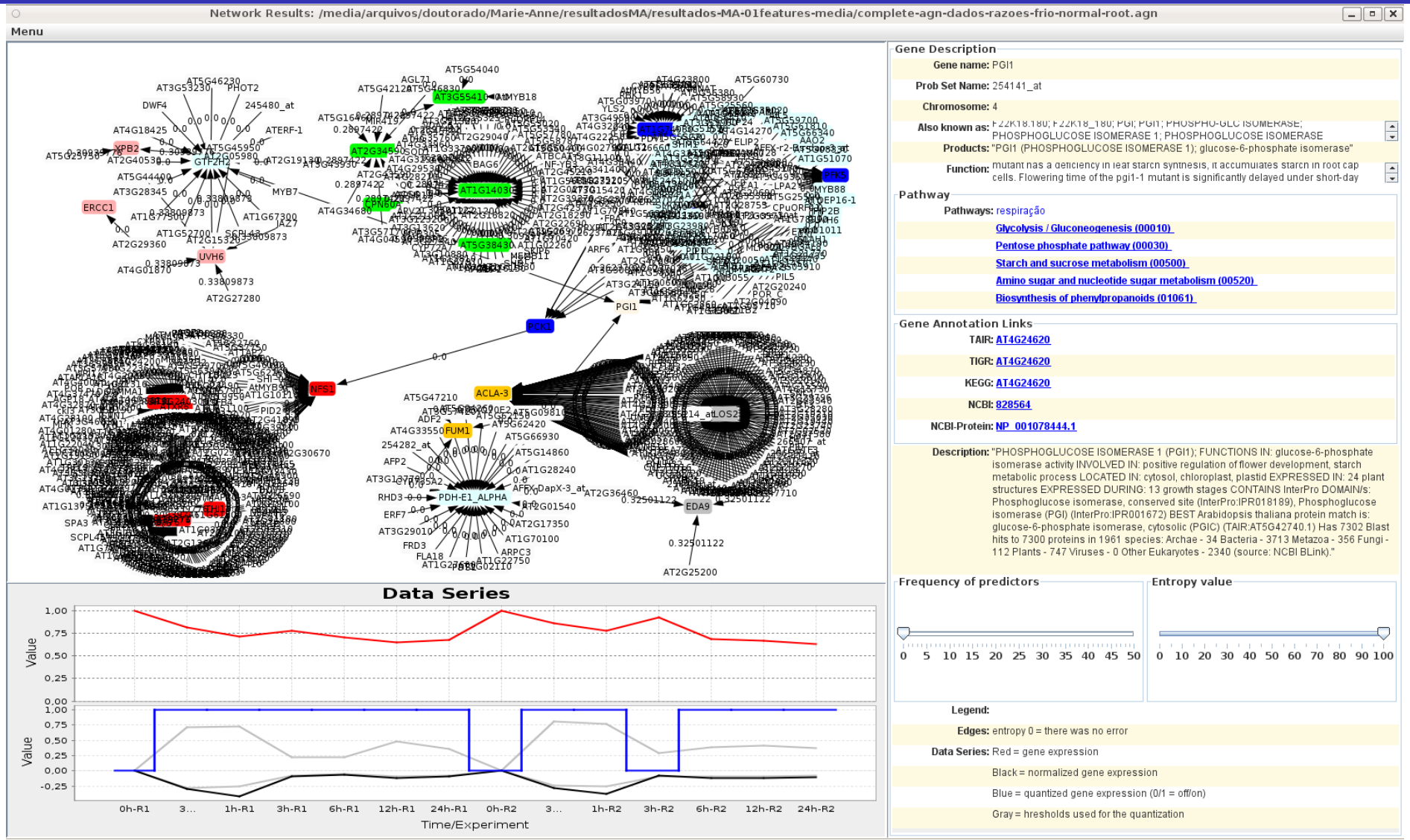
→ Inference Procedure

Steps for Gene Regulatory Network Inference

Inference Procedure

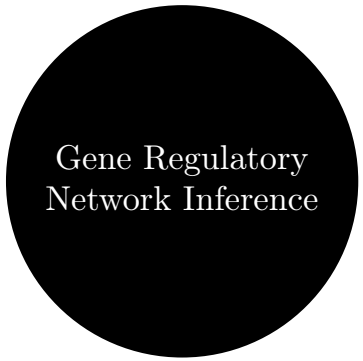


Tool for Knowlegde Discovery



Lopes et al. Feature Selection Environment for Genomic Applications, BMC Informatics, 2008.

Challenges of Using Gene Expression Data



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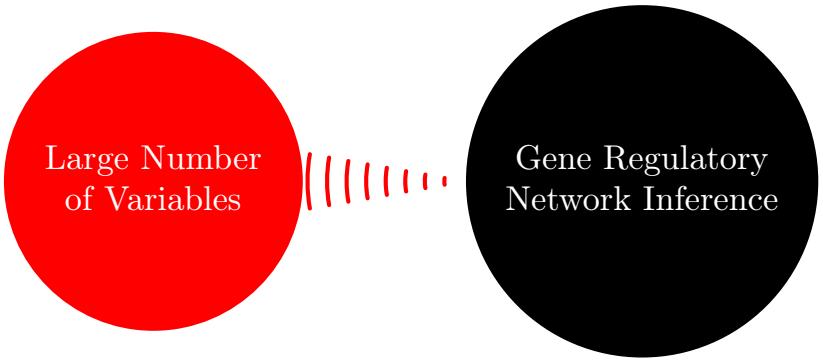

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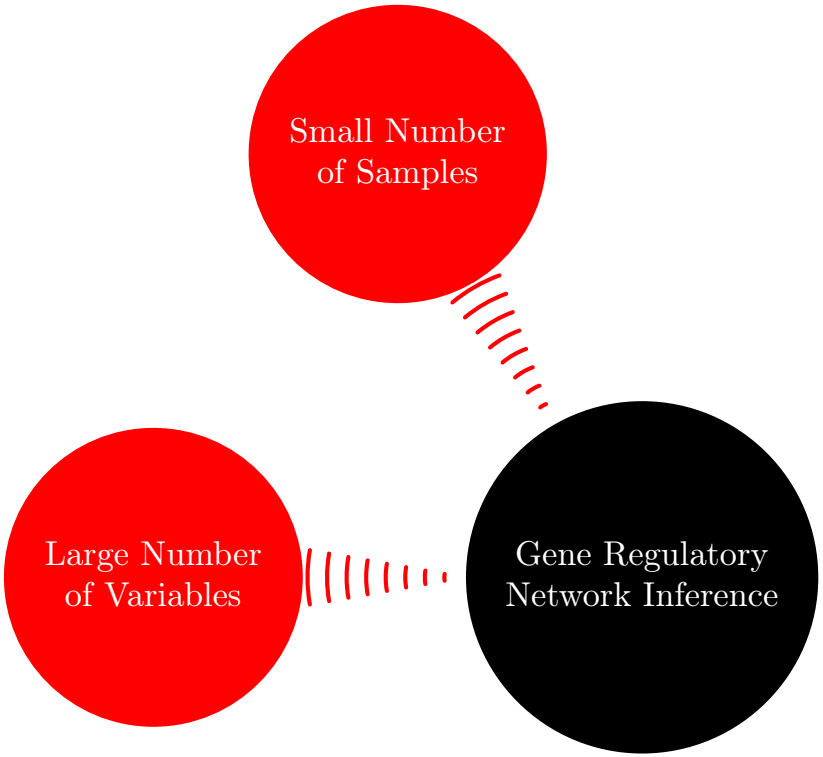

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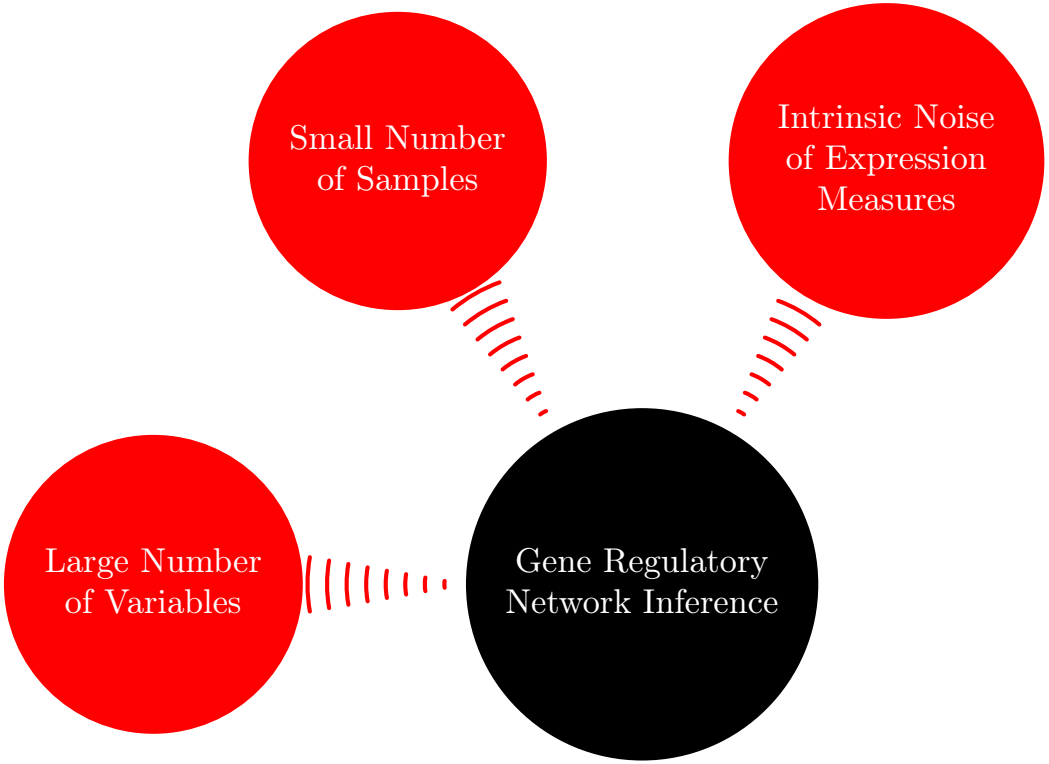

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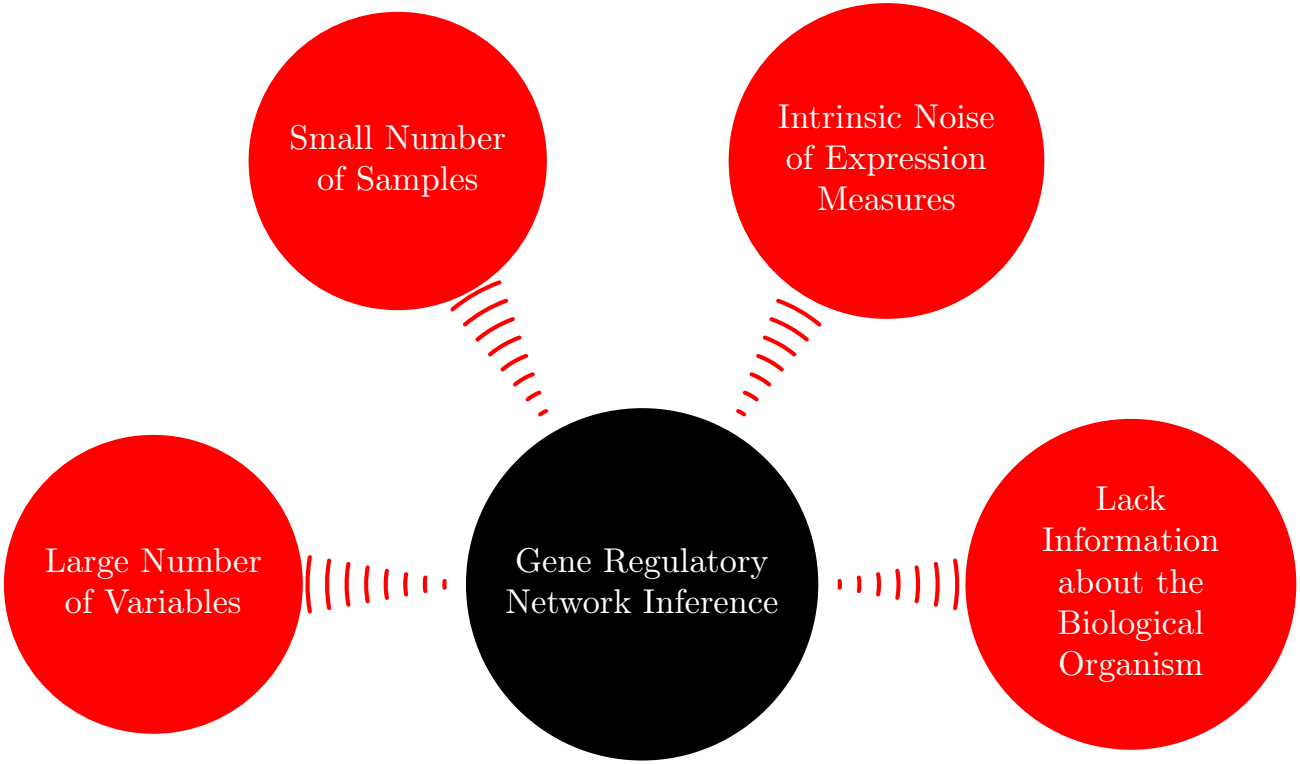

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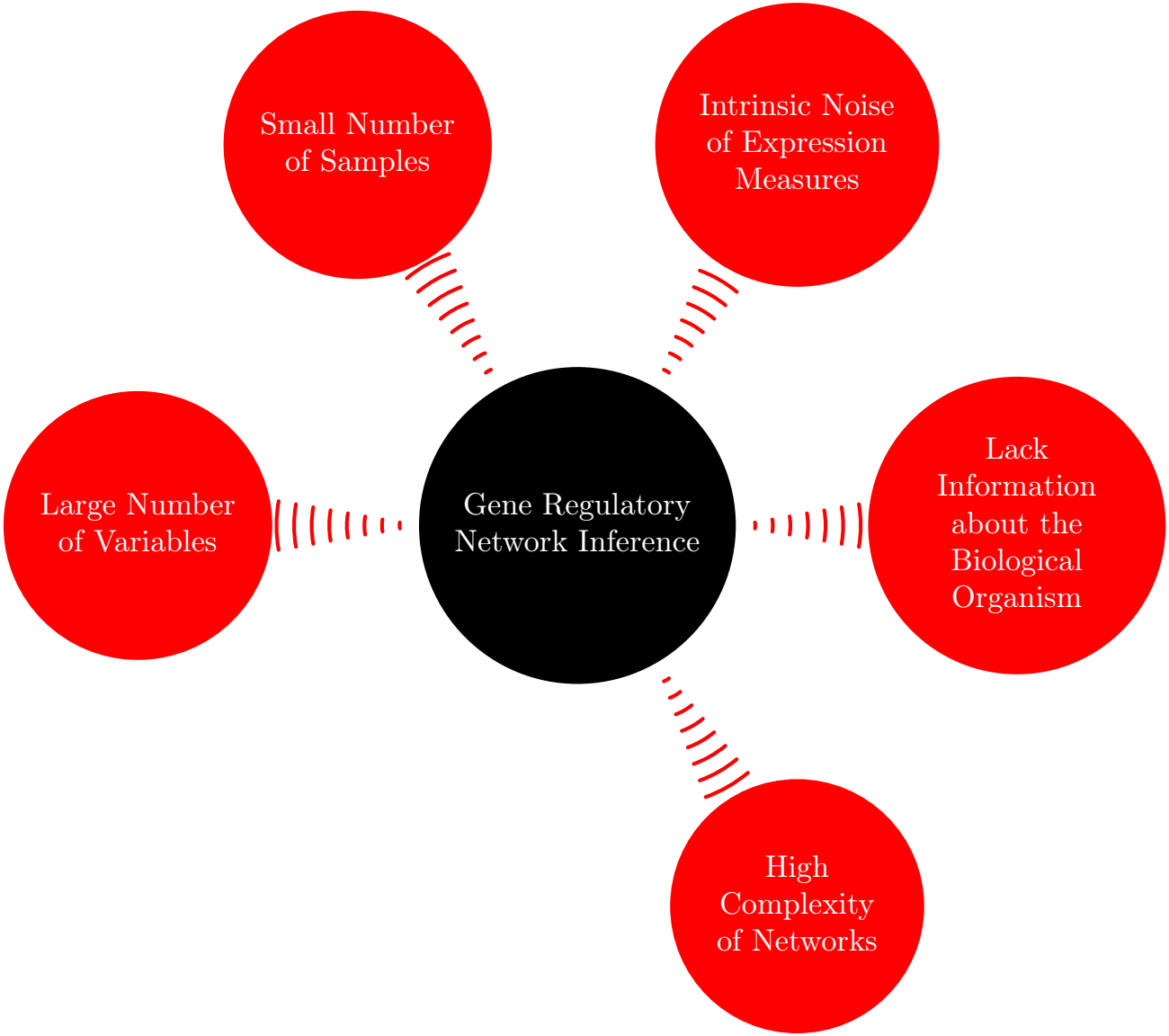

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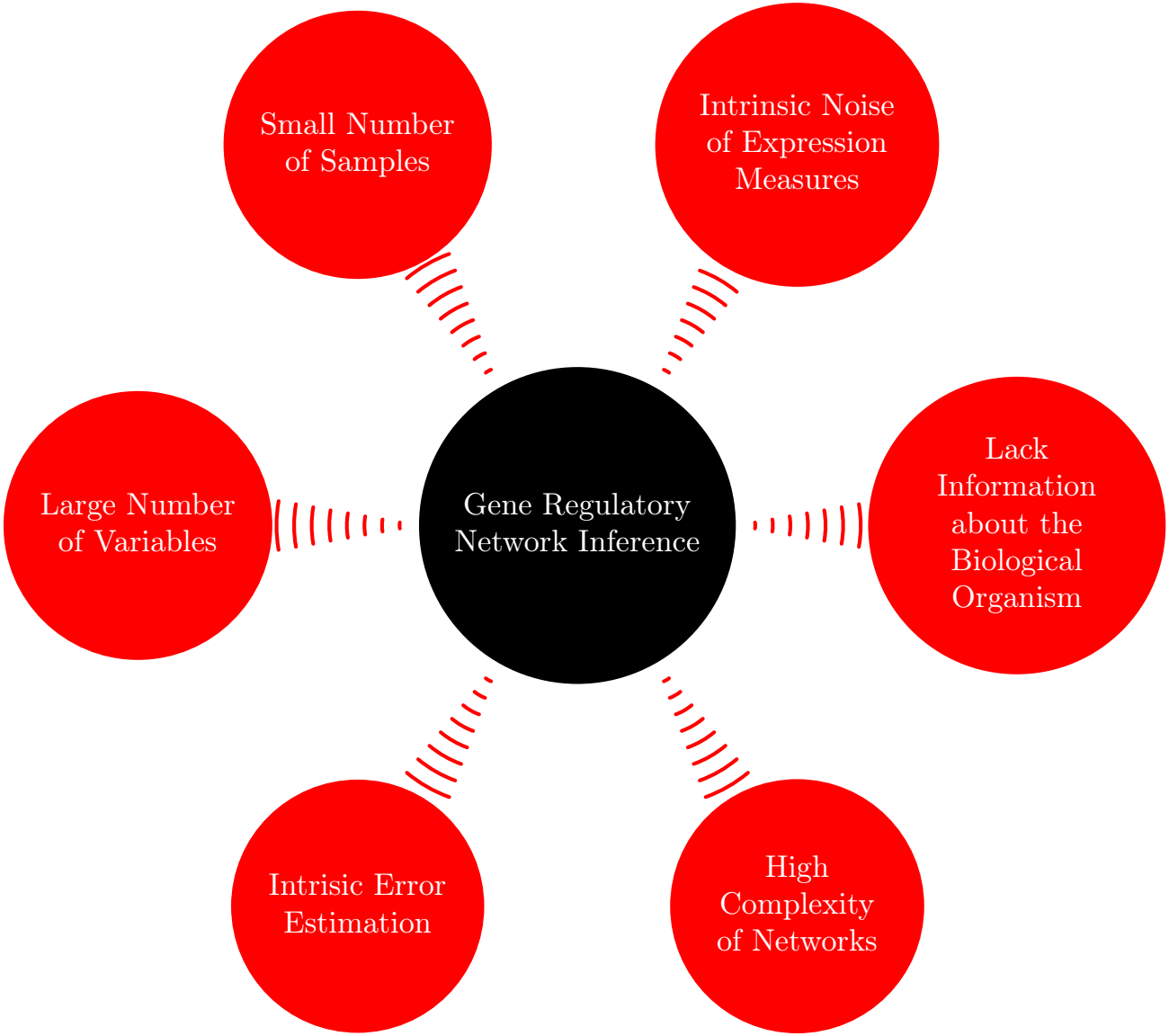

Our Proposal

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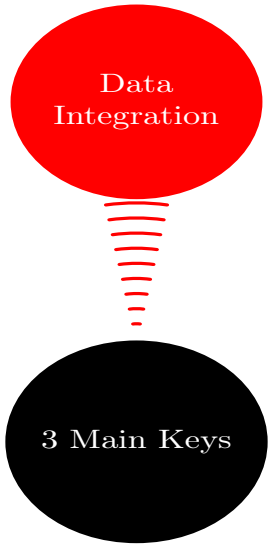

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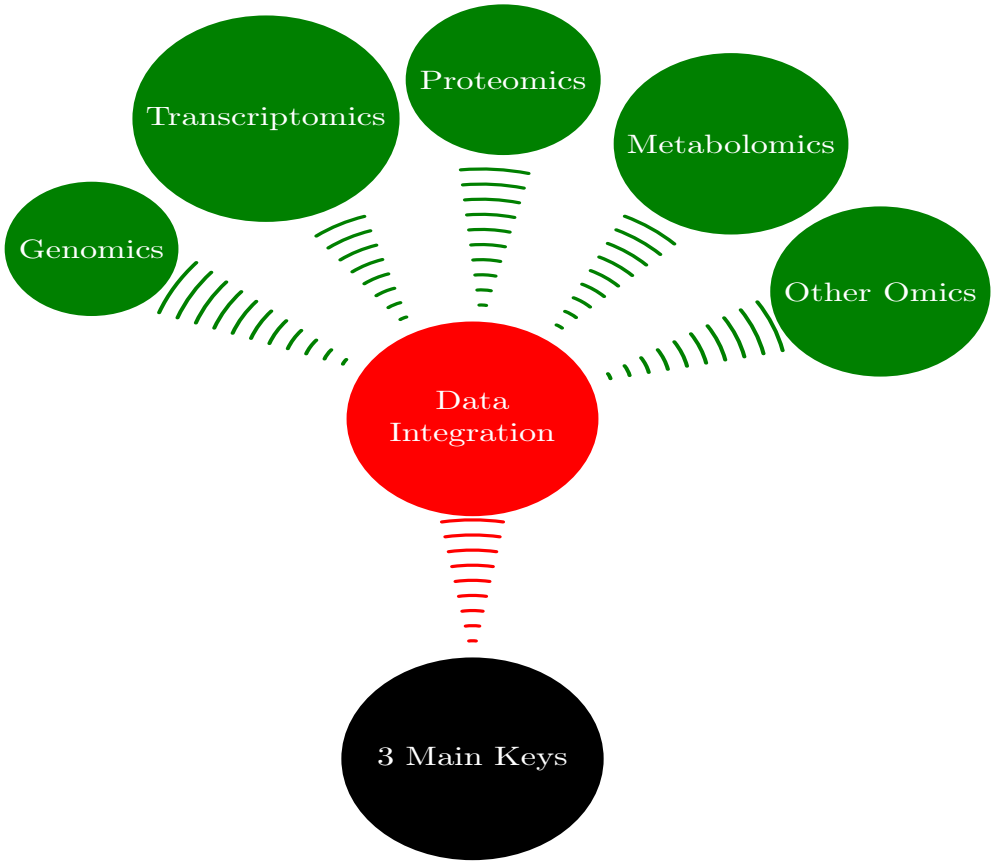

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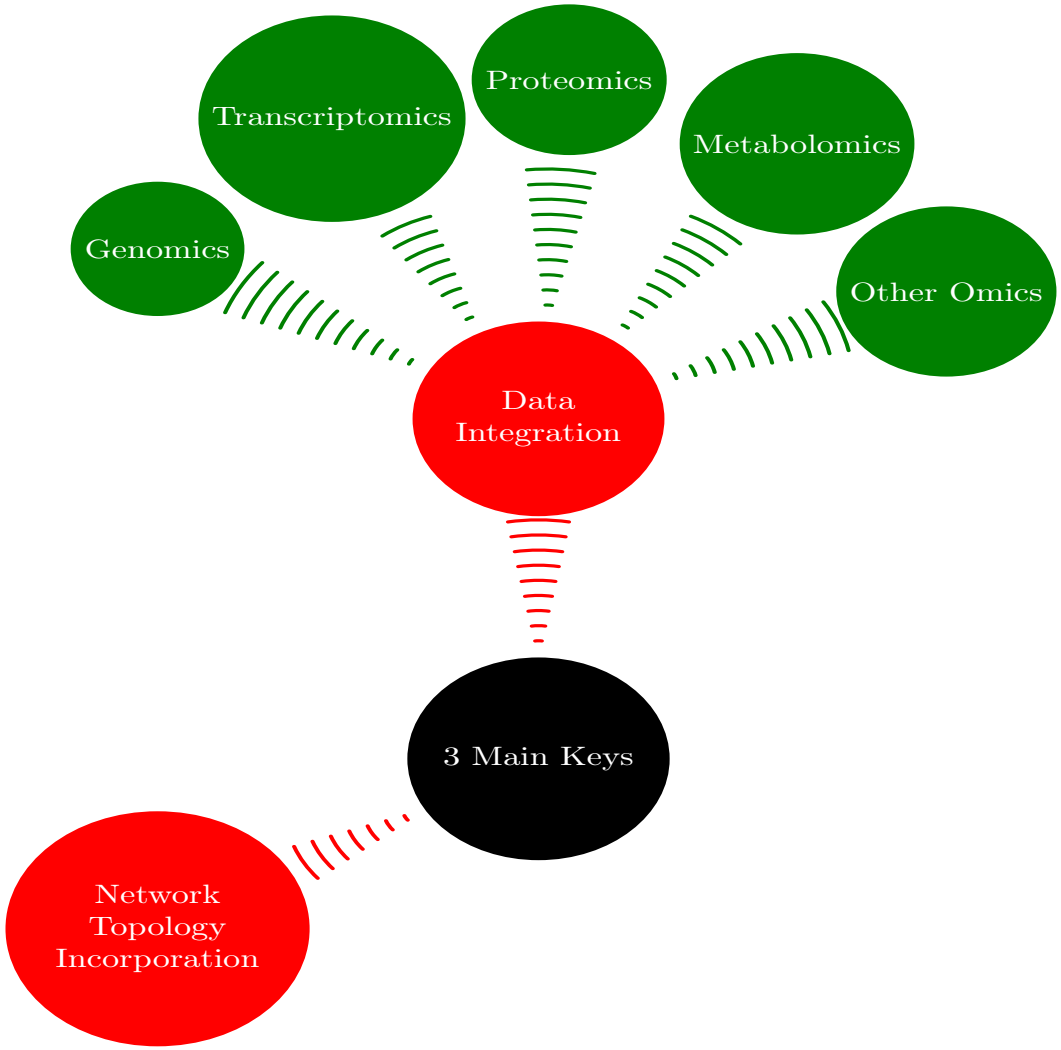

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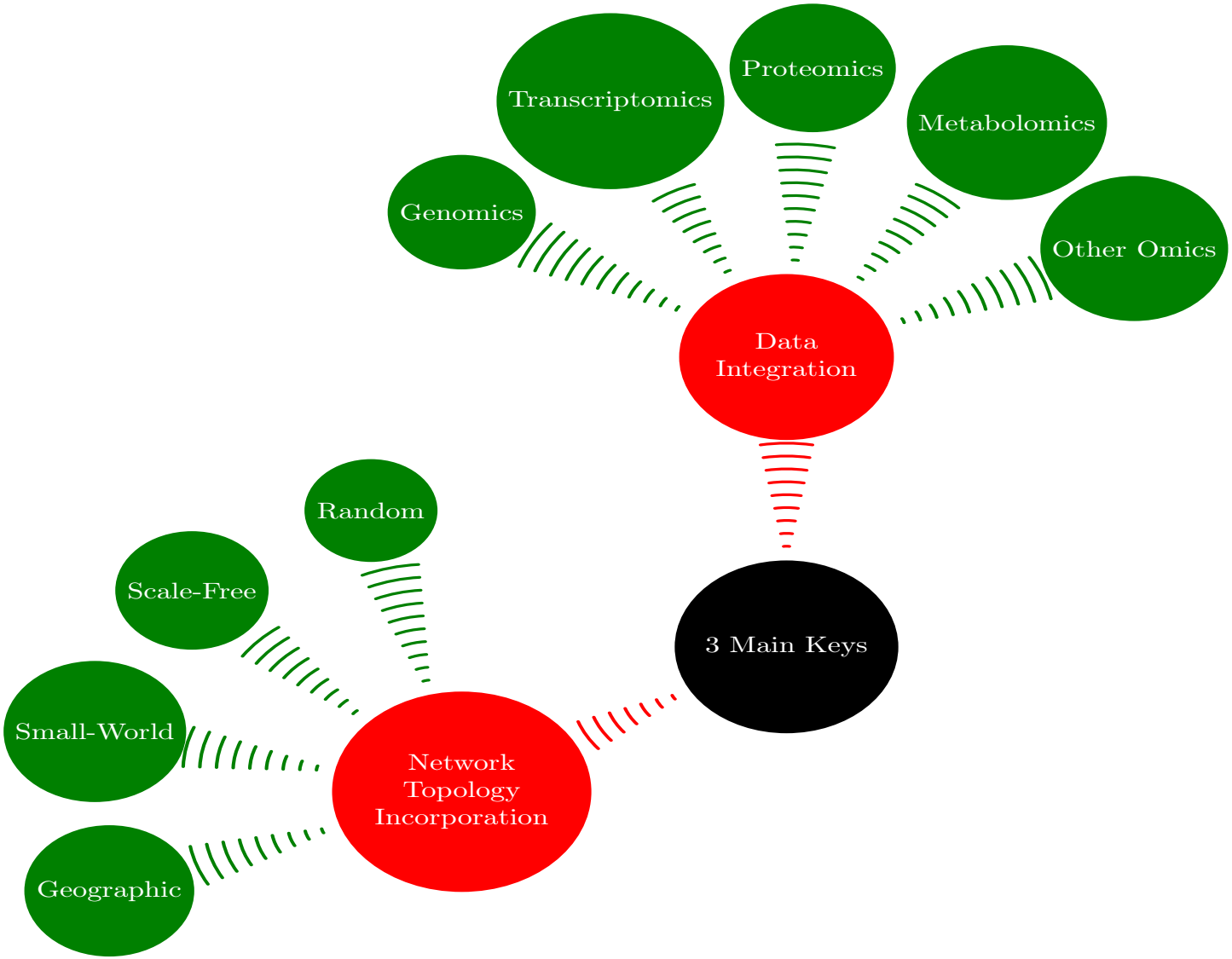

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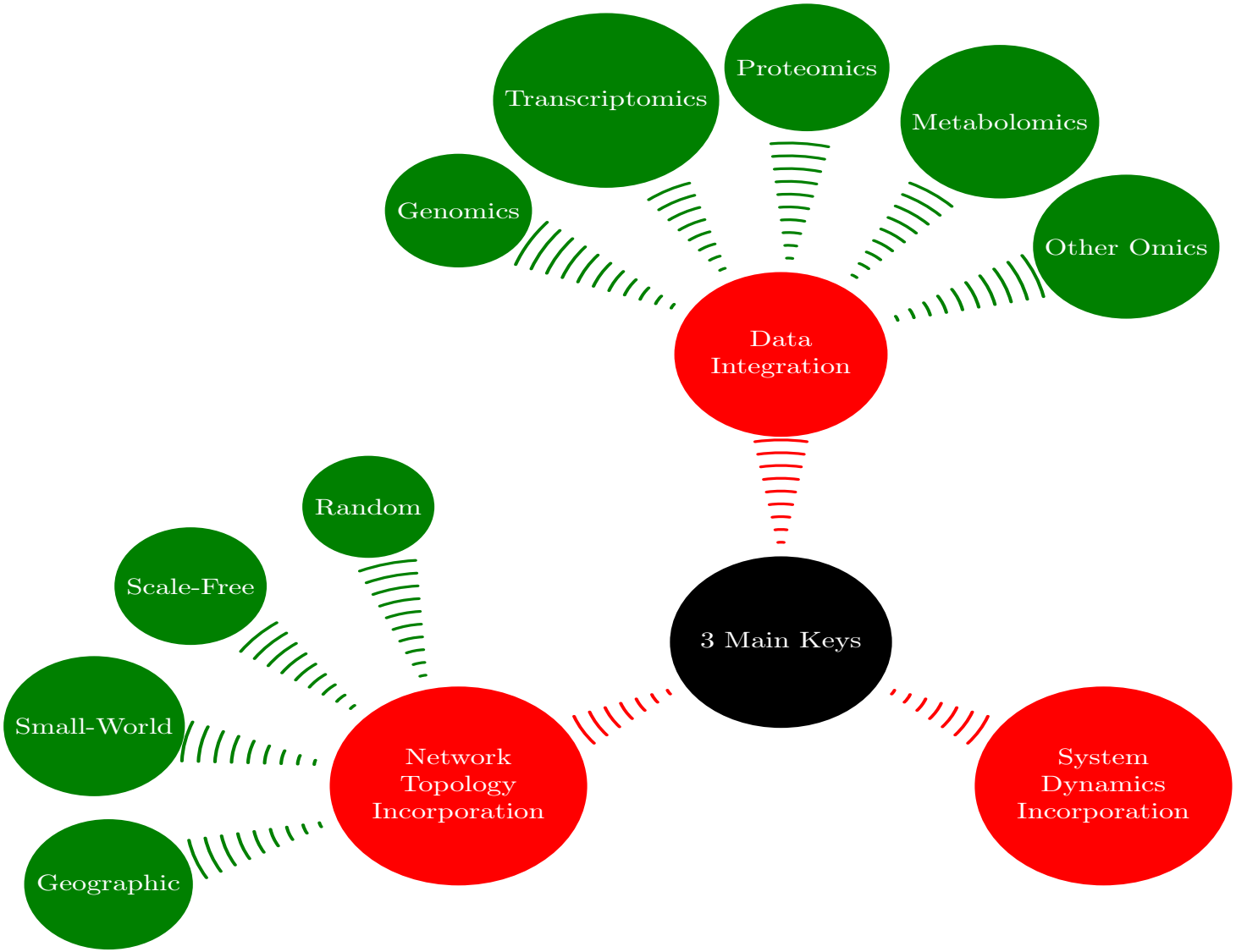

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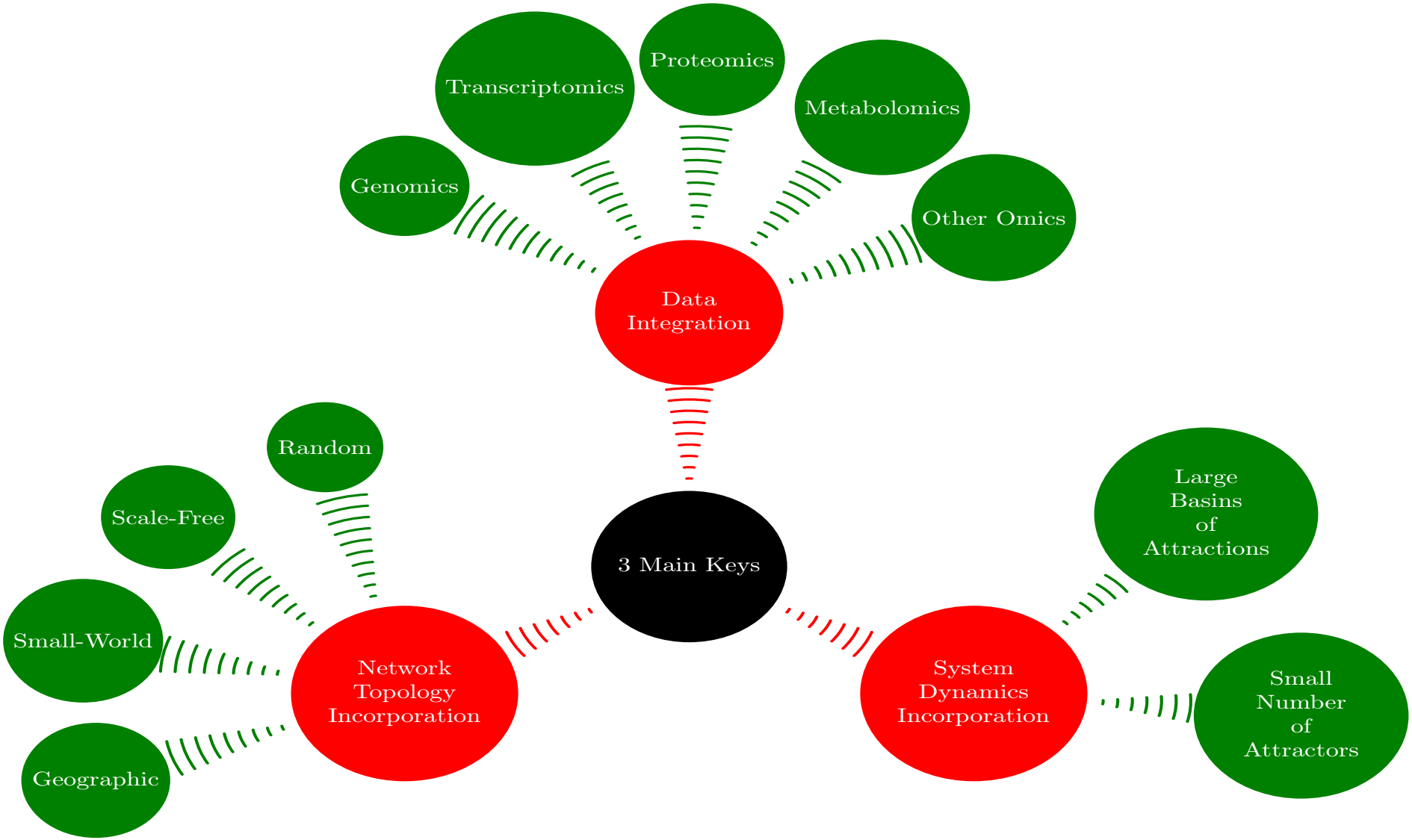
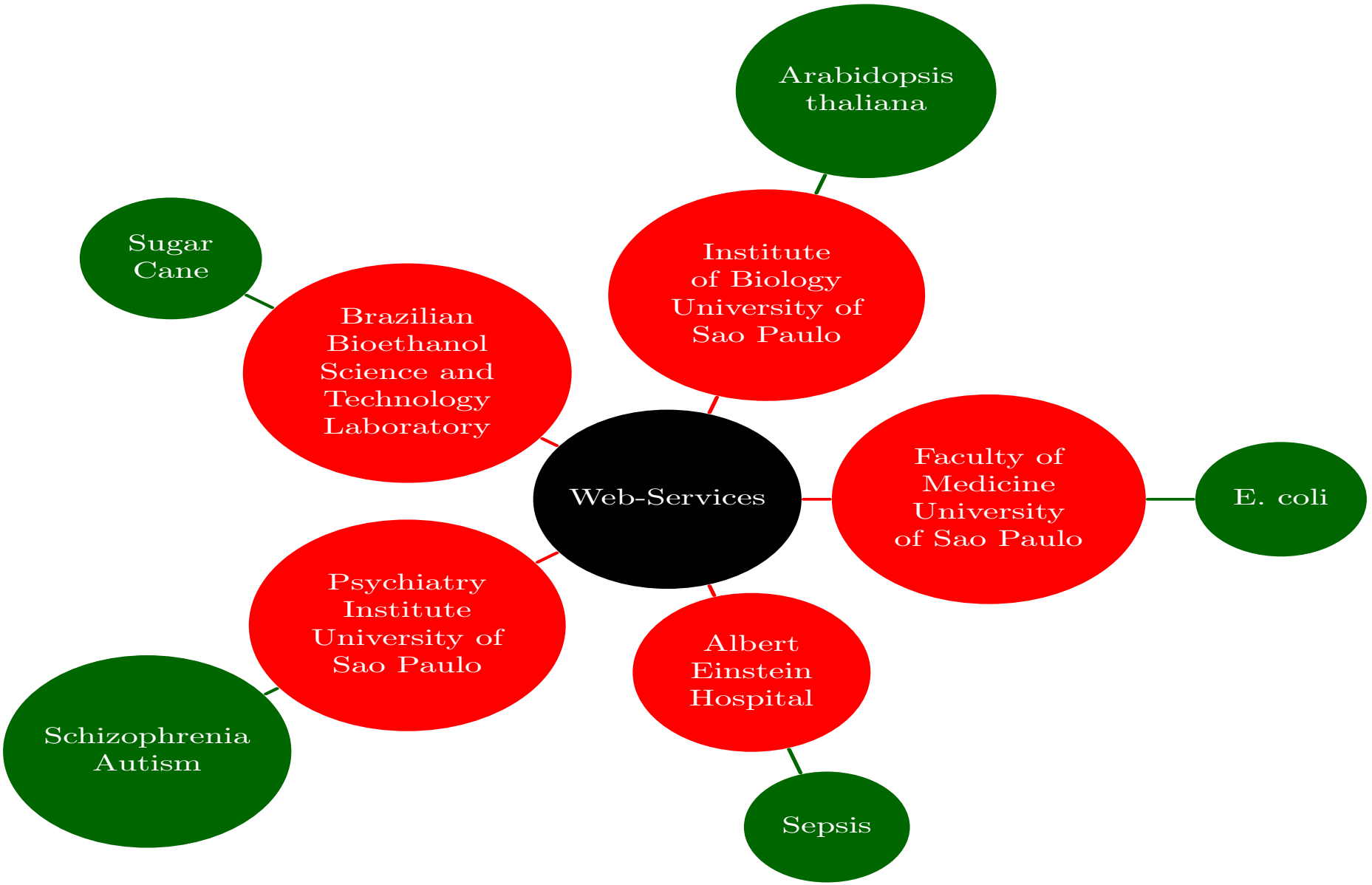


Domain Partners

Web-Services



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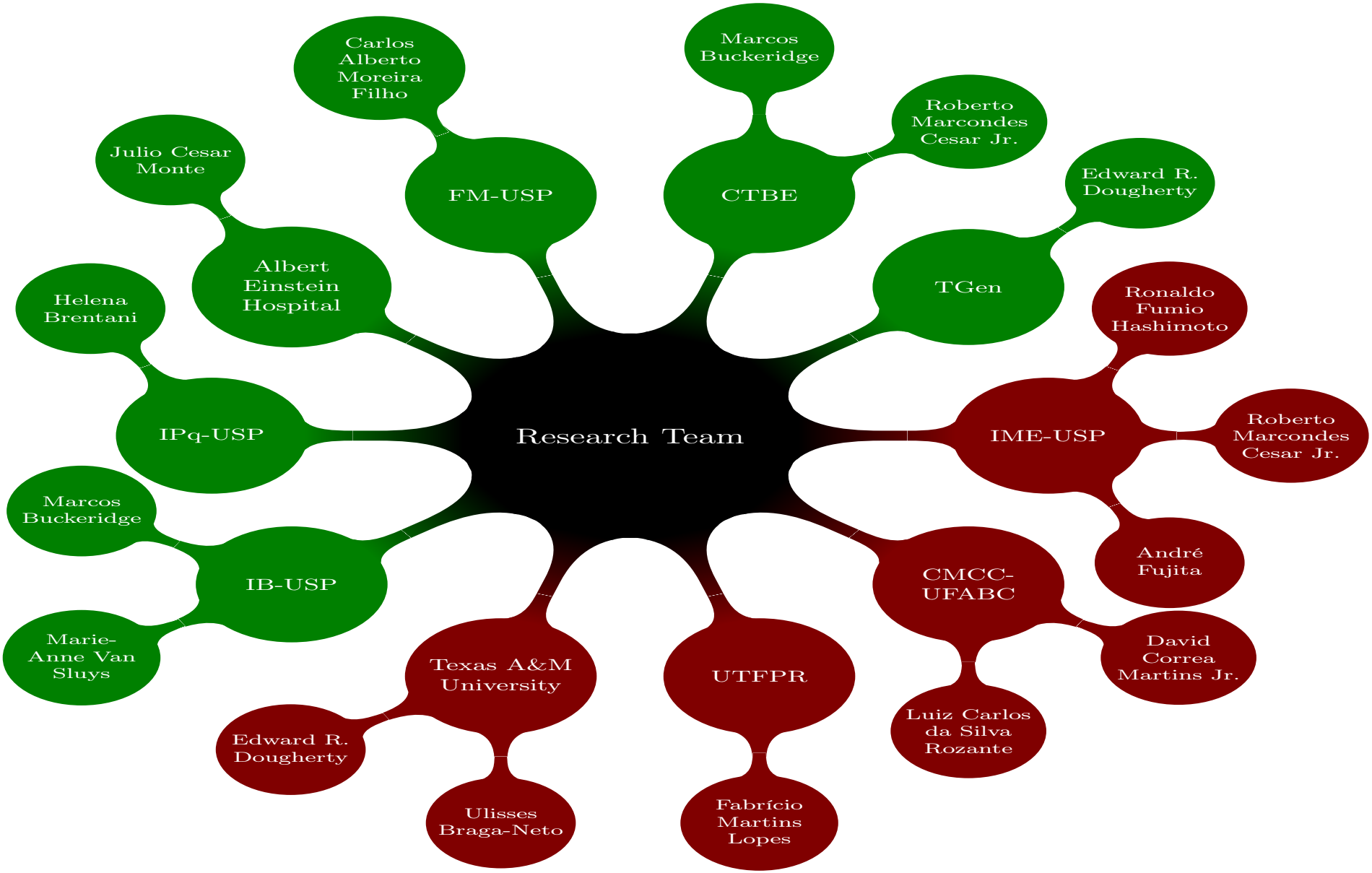

Ongoing Research

- F. M. Lopes, R. M. Cesar Jr., L. F. da Costa. Gene Expression Complex Networks: Synthesis, Identification and Analysis. Journal of Computational Biology, 2011.
- F. M. Lopes, E. A. de Oliveira, R. M. Cesar Jr. Inference of Gene Regulatory Networks from Time-Series by Tsallis Entropy. BMC Systems Biology, 2011.
- C. H. A. Higa, V. H. P. Louzada, T. P. de Andrade, R. F. Hashimoto. Constraint-Based Analysis of Gene Interactions using Restricted Boolean Networks and Time-Series Data. BMC Proceedings, 2011.

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