

Ferramentas de análise de redes gênicas/protéicas aplicadas ao ordenamento de interatomos

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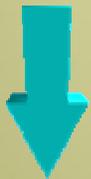
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Equipe

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- Leonardo Brunnet (Física-UFRGS)
- José Carlos M. Mombach (Depto. Física UFSM)
- Mauro Castro (Bioquímica-UFRGS/ULBRA)
- José Luiz R ybarzyck (Física-UFRGS)
- Rodrigo Dalmolin (Bioquímica-UFRGS)
- Fernanda Benetti (Física-UFRGS)
- Willian Radünz (Física-UFRGS)

TRANSCRIPTION

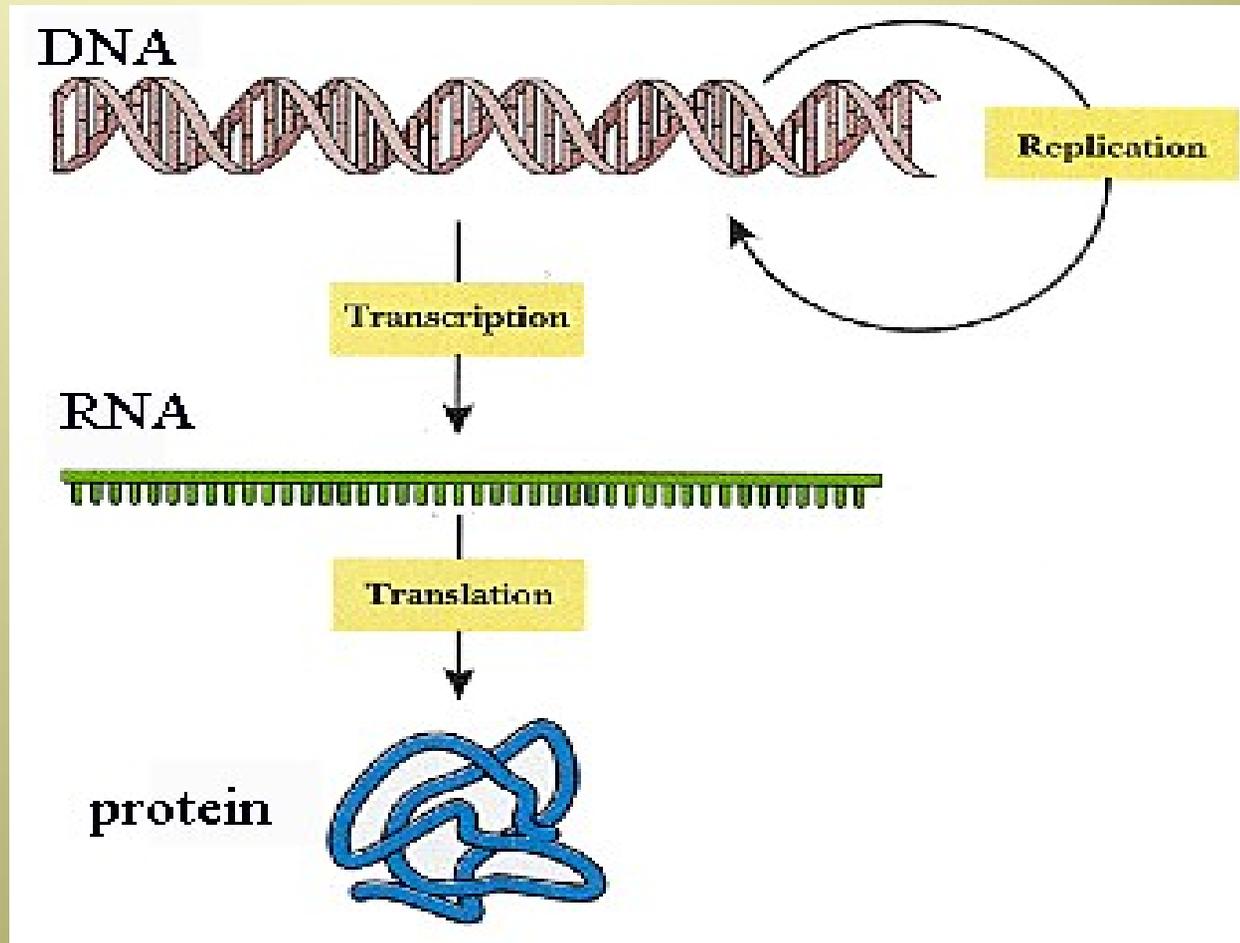
DNA



RNA



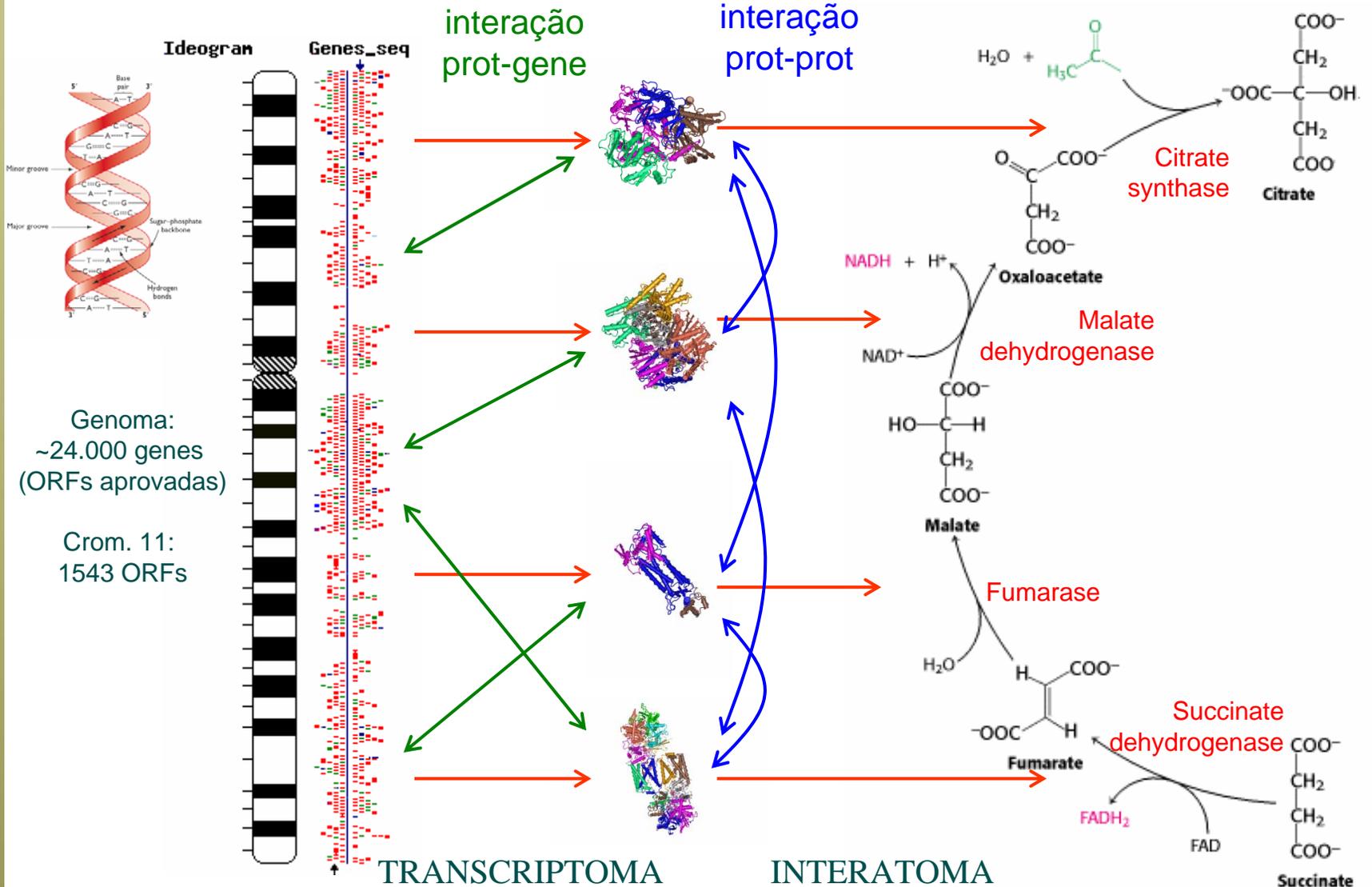
PROTEÍNA



GENOMA

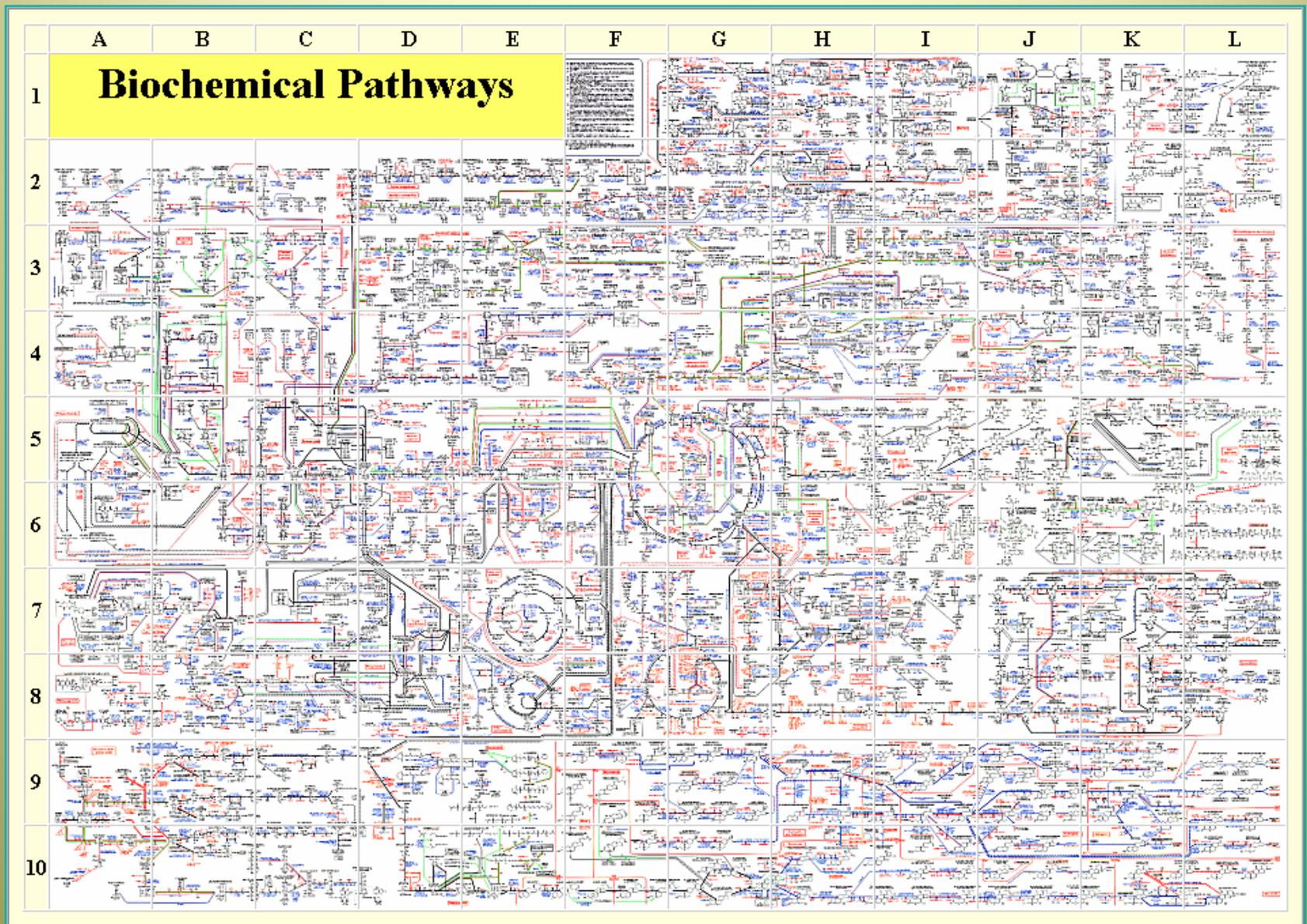
PROTEOMA

METABOLOMA



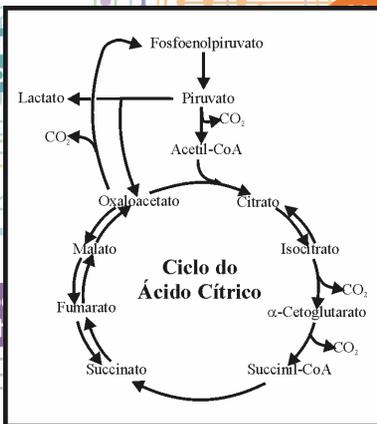
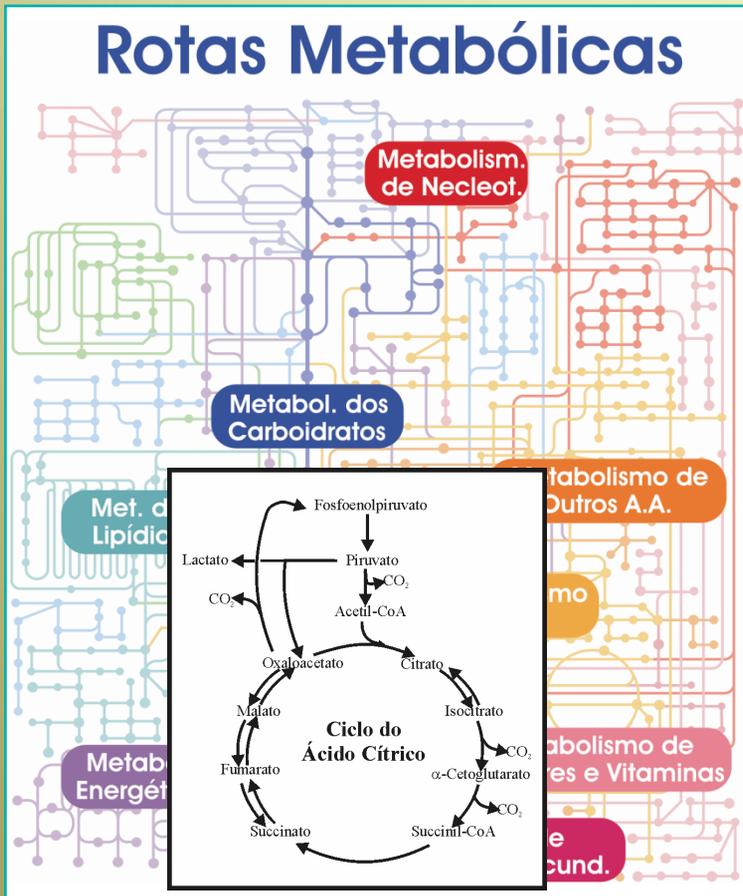
Bases de dados experimentais.

- Ensembl (Proteina e Genes)
- Uniprot EBI -
- Entrez NCBI
- HUGO
- Saccharomyce cerevisae
- Ecocyc
- STRING (EMBL) (3 espécies)
- Affymetrix (sondas para microarray)
- SAGE
- KEGG
- Gene Ontology

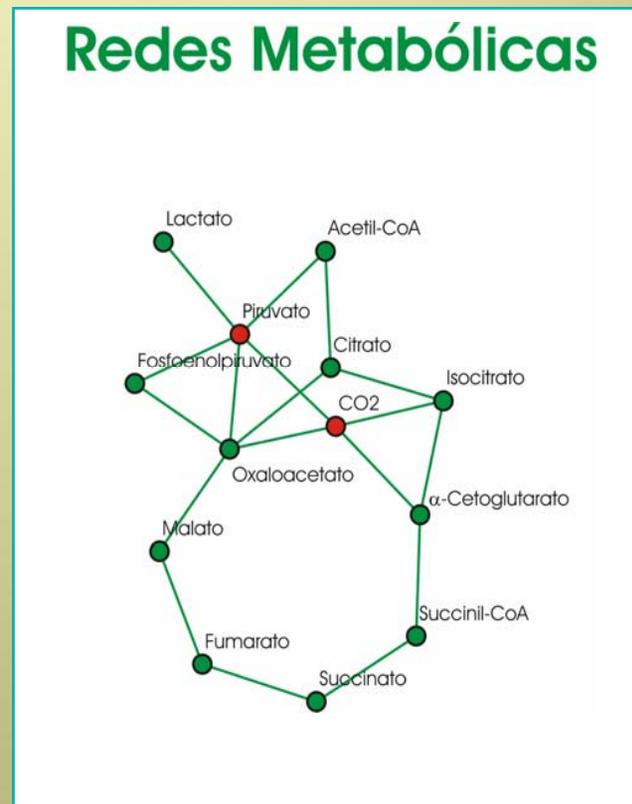


Definições

Rotas Metabólicas

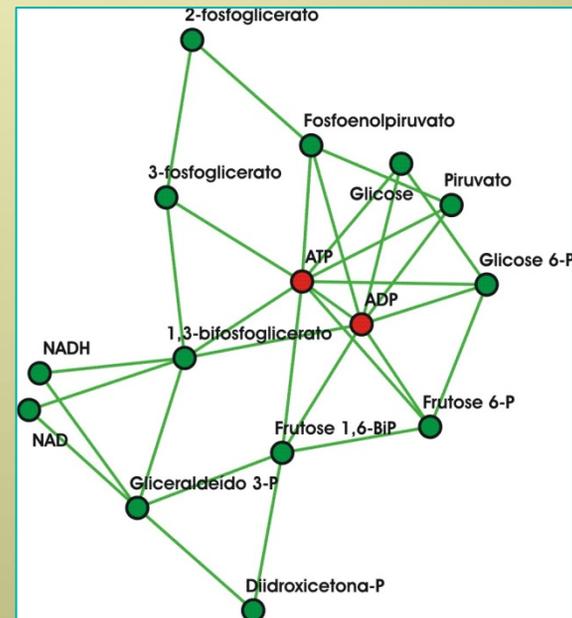
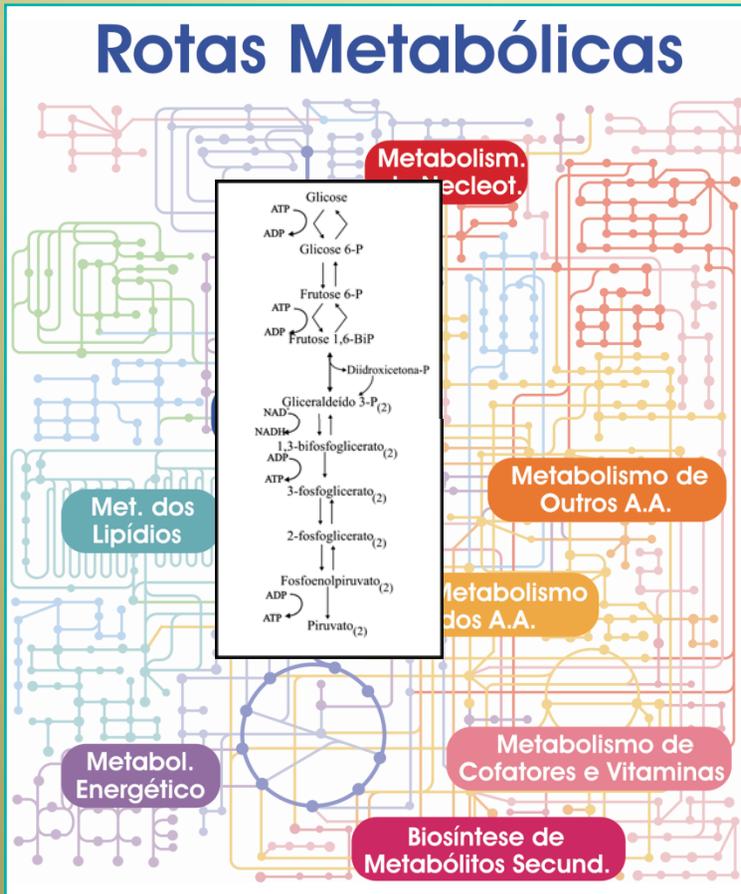


Redes Metabólicas

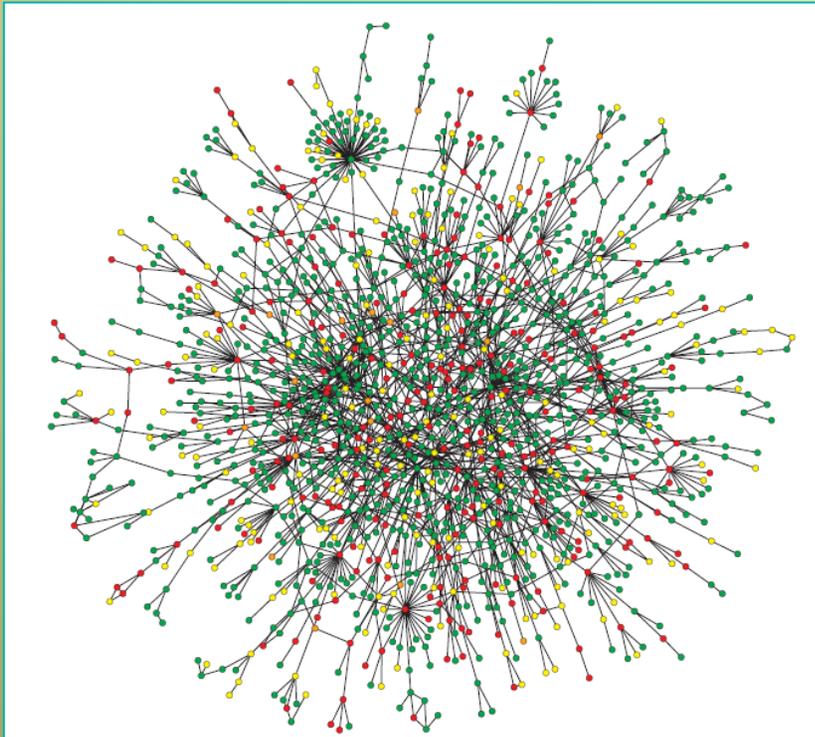


Definições

Rotas Metabólicas



Redes protéicas



- Nodos: proteínas
- Ligações: interações físicas
- String data base

Gene Ontology Database

- Classificação dos genes por
 - Processo Biológico
 - Componente Celular
 - Função Molecular
- Estrutura hierárquica: termos pais, filhos, irmãos,...

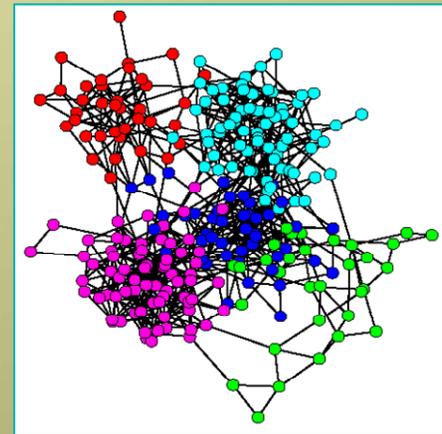
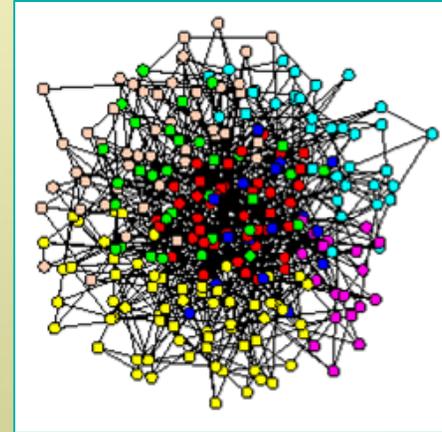
Como analisar?

- Rotas metabólicas → Baseadas em funções!
- Como isolar sistemas? Como estimar os erros do isolamento?

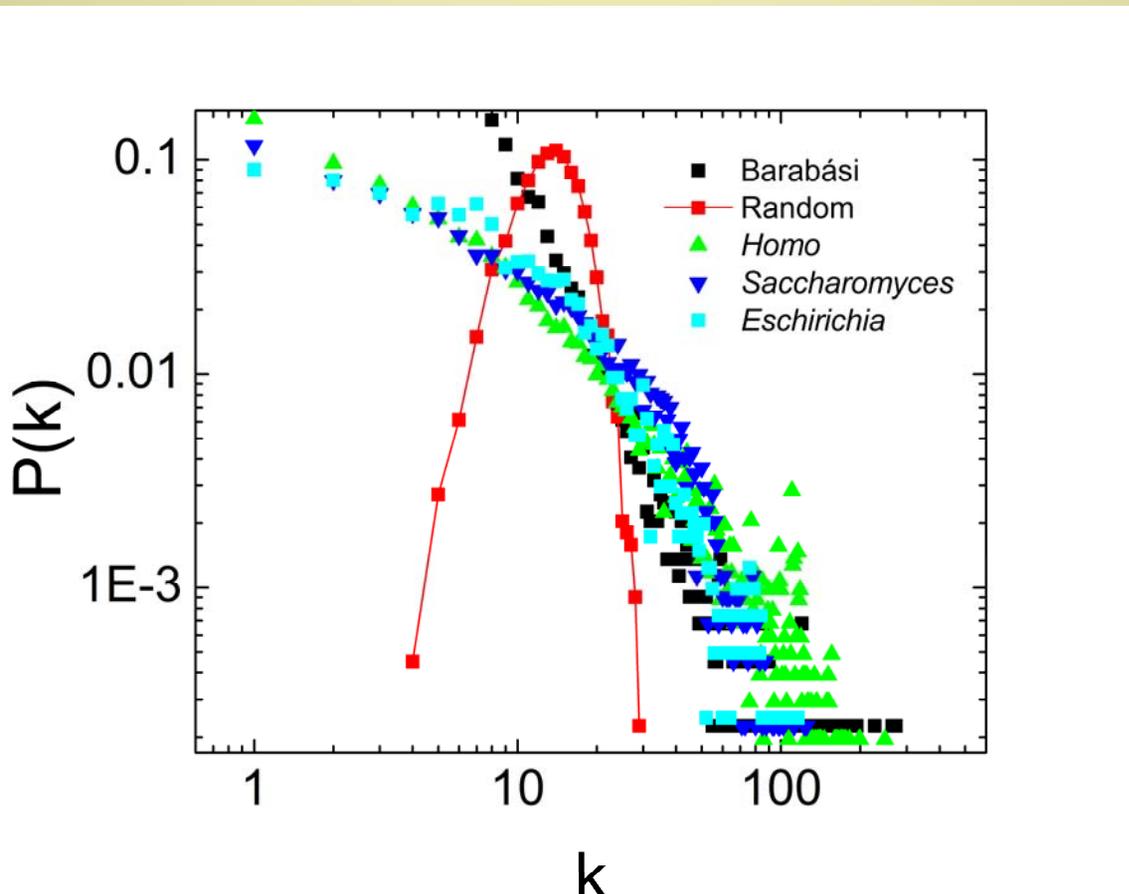
Modularidade

- Scale-free

- Modular

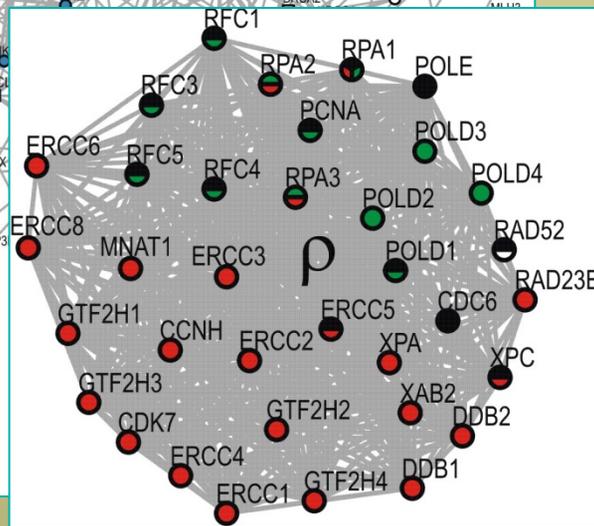
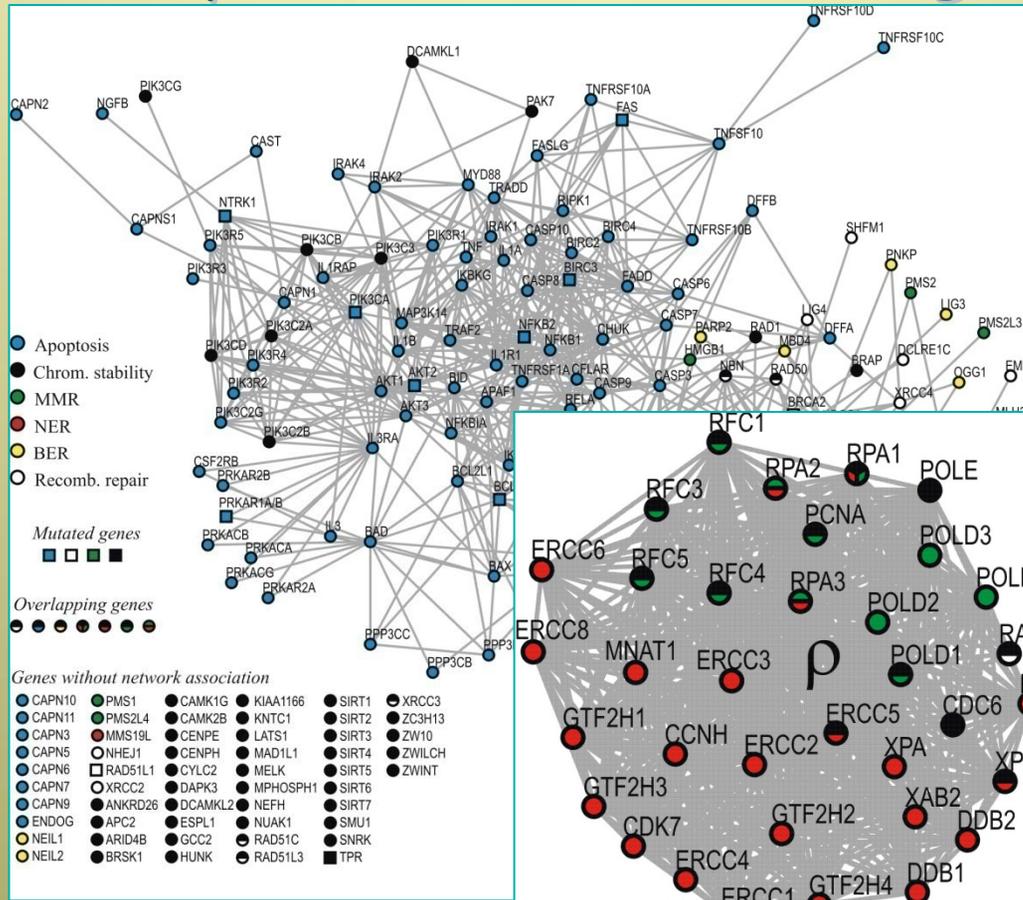


Distribuição de grau de conectividade



Rotas de reparo e estabilidade genômica

Redes de interações para gens de reparo e apoptosís

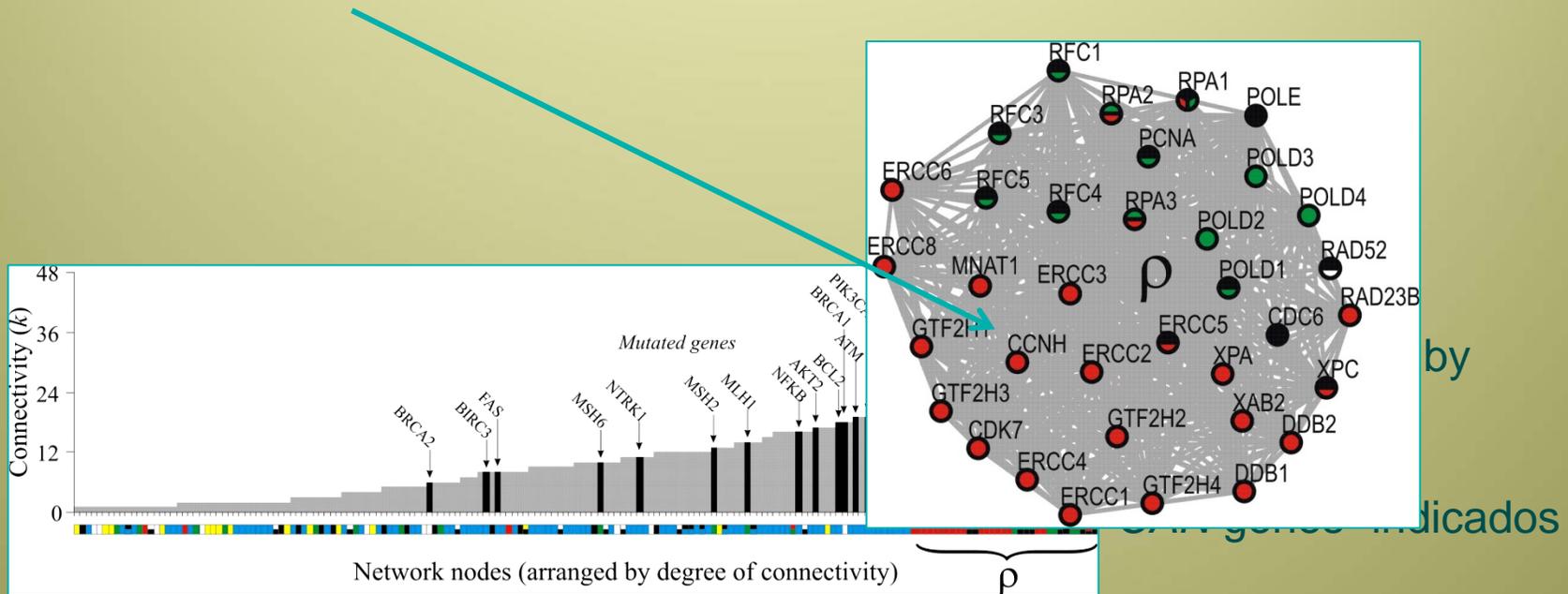


Módulo de reparo ρ :

- NER
- MMR
- C.S.

Rotas de reparo e estabilidade genômica

Módulo ρ é altamente conectado!
Não há mutações em ρ !



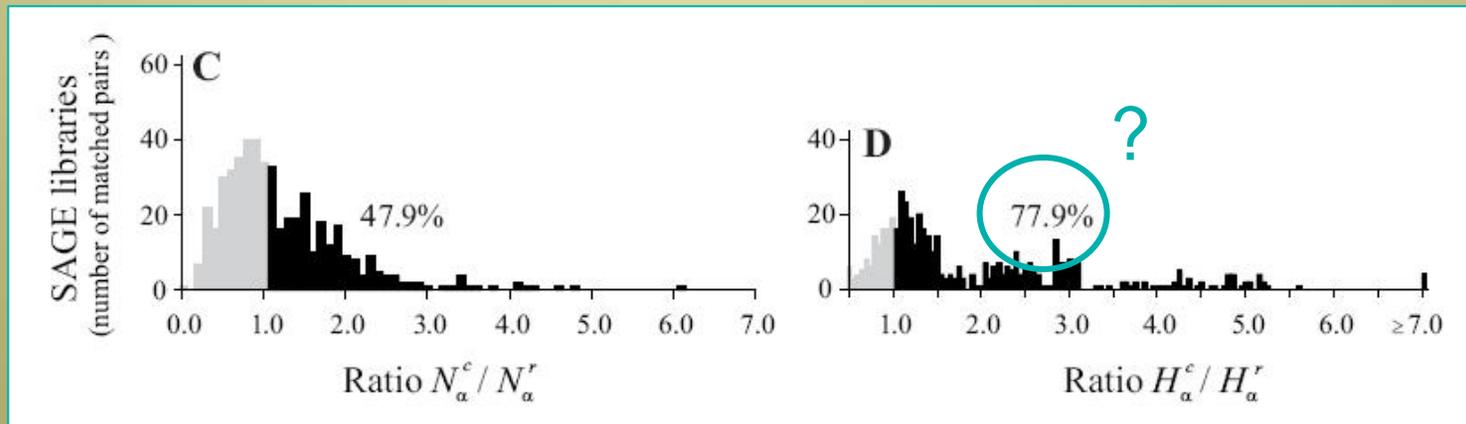
Módulo ρ em câncer

Expressão gênica em tumores sólidos

X

células normais

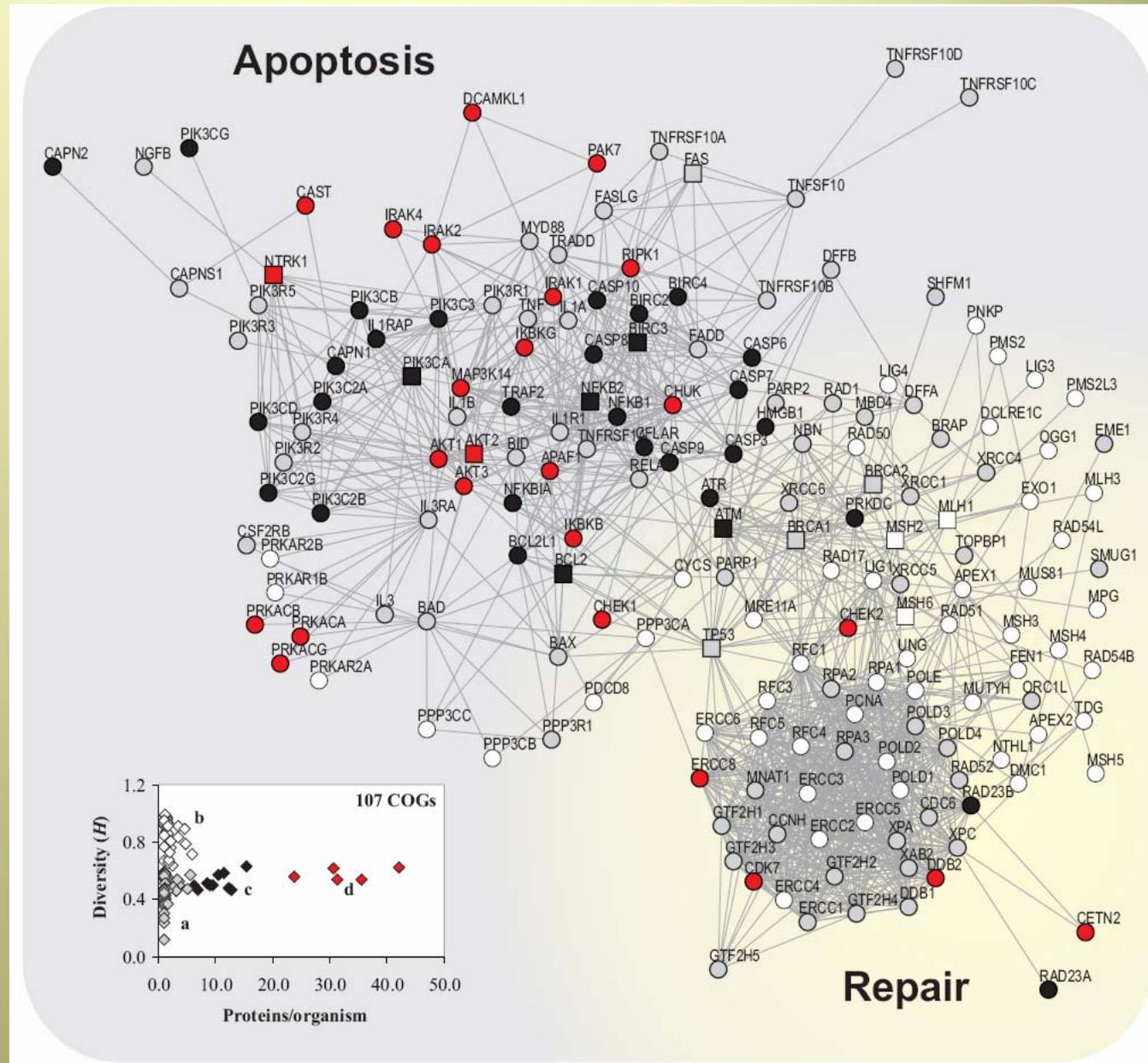
(número e diversidade de transcritos)

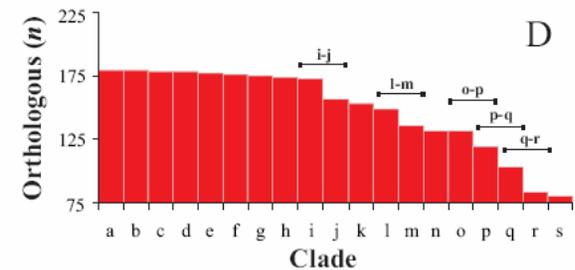
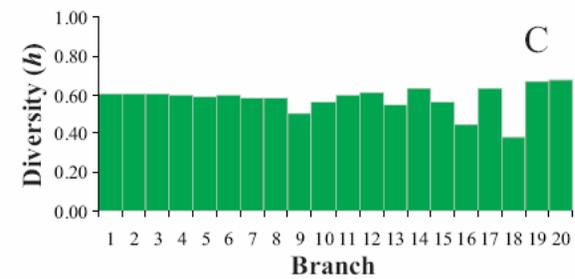
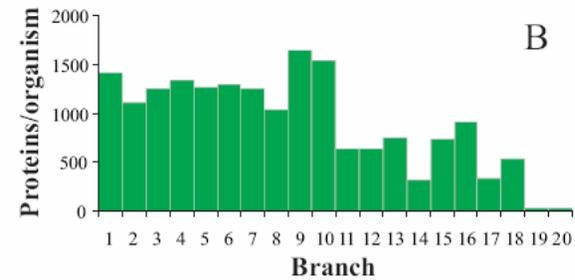
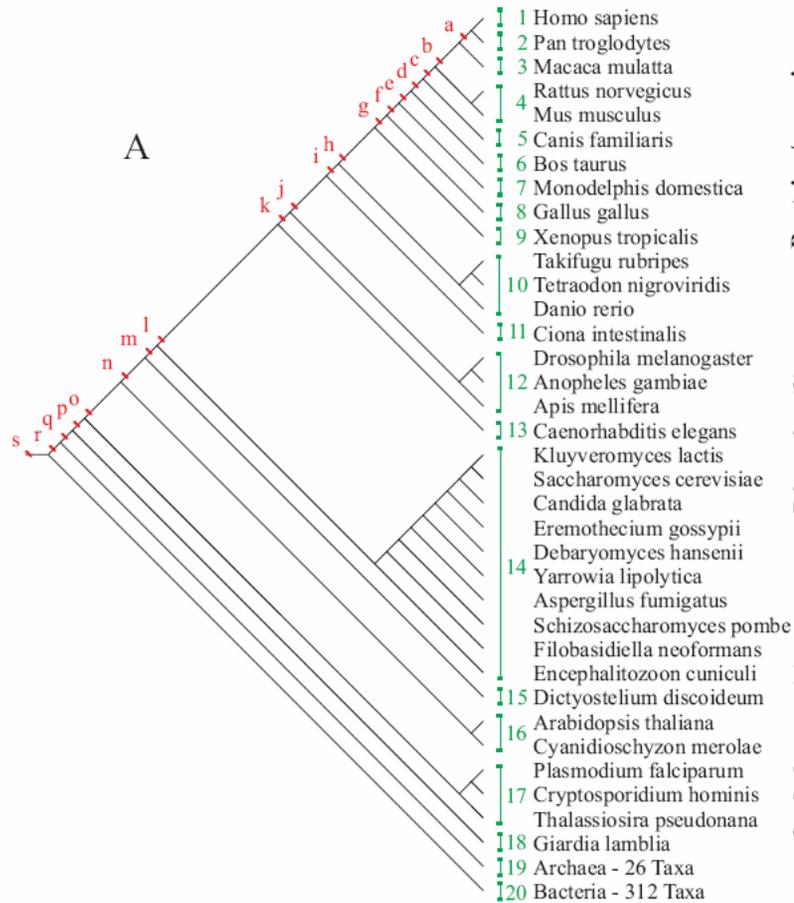


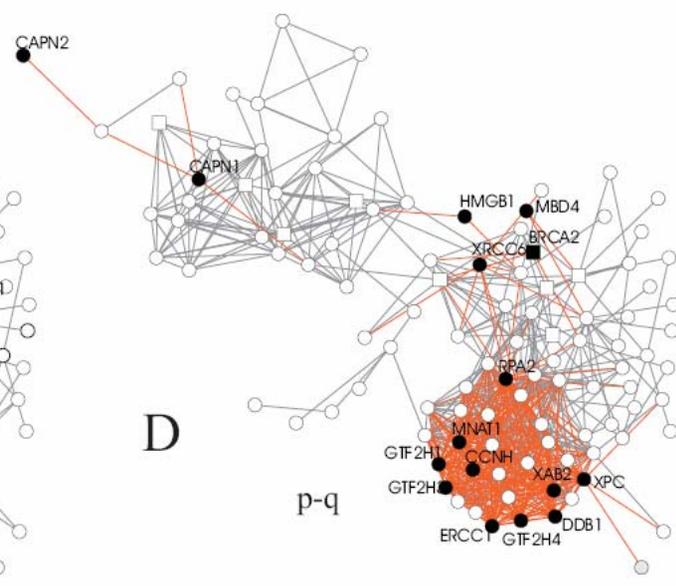
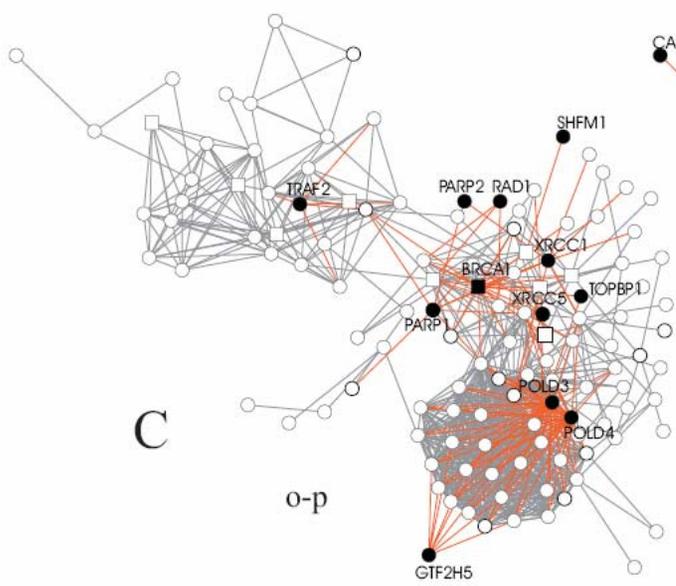
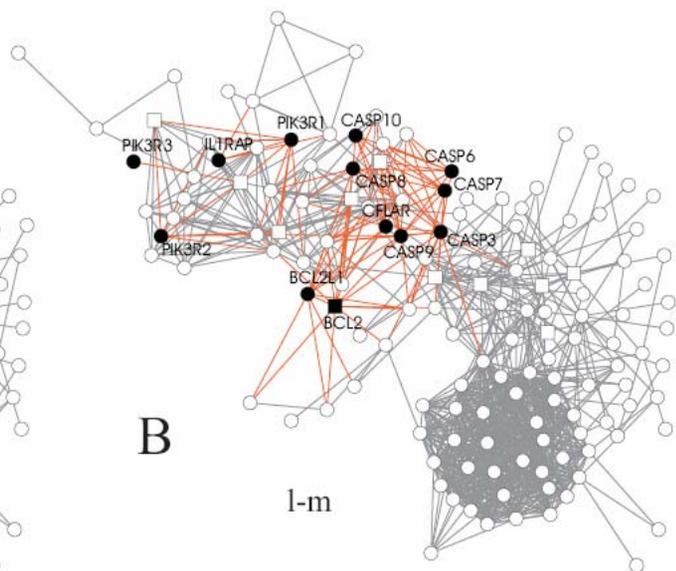
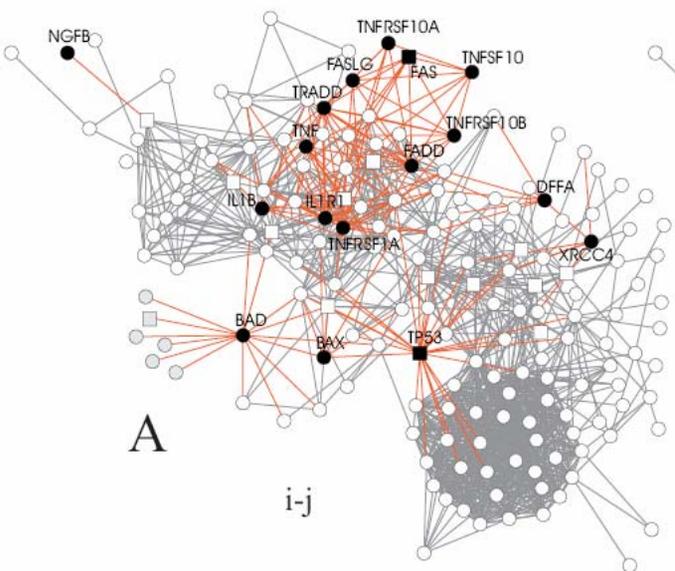
Expressão gênica (não alterada)

Aumento de diversidade em
77.9% dos tumores

Porque ρ
 não está
 funcionando
 bem?



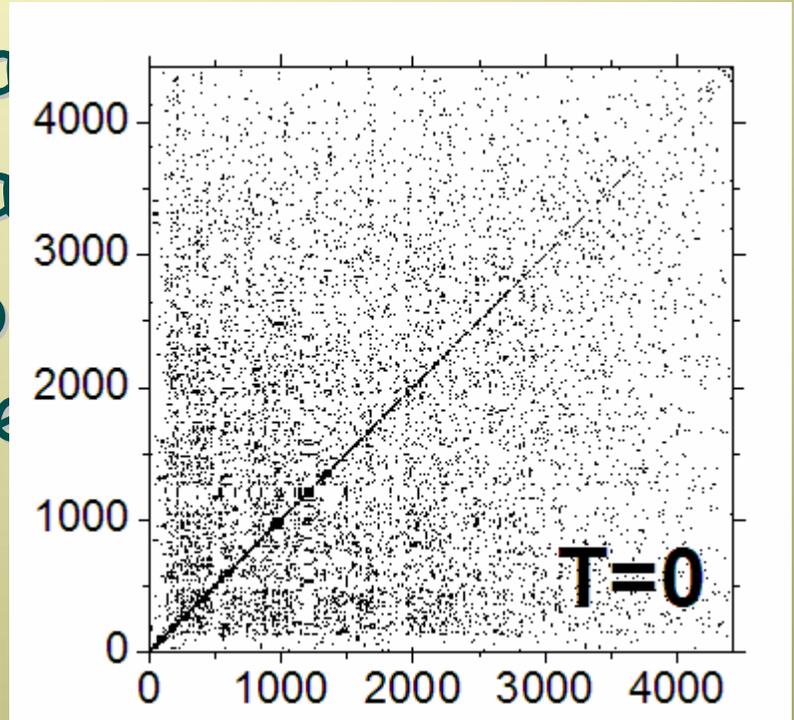
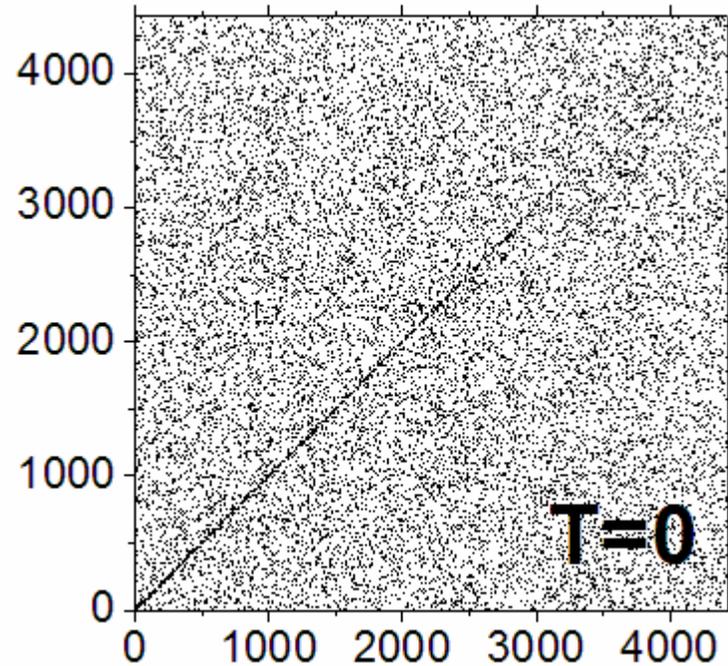
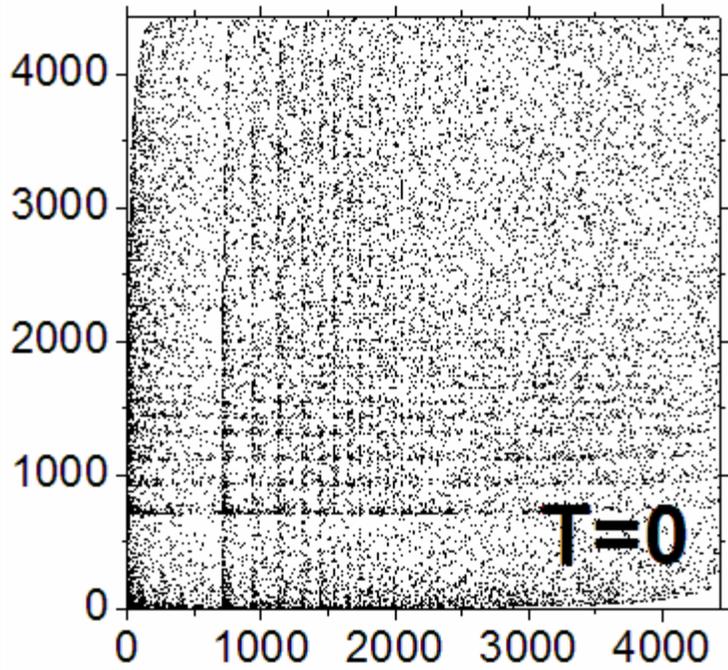




Como escolher o conjunto de proteínas?

- Funções?
- Interações?
- Como agrupar?
- E como estimar o efeito do resto?
- E como explicar a evolução?

Organisation of criptomes



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