Can we find disease fingerprints in our metabolome?

UNIL BSc course: Solving Biological Problems that require Math 2018

Supervisor: Mirjam Mattei
Department of Computational Biology
UNIL - Lausanne

Phenotype
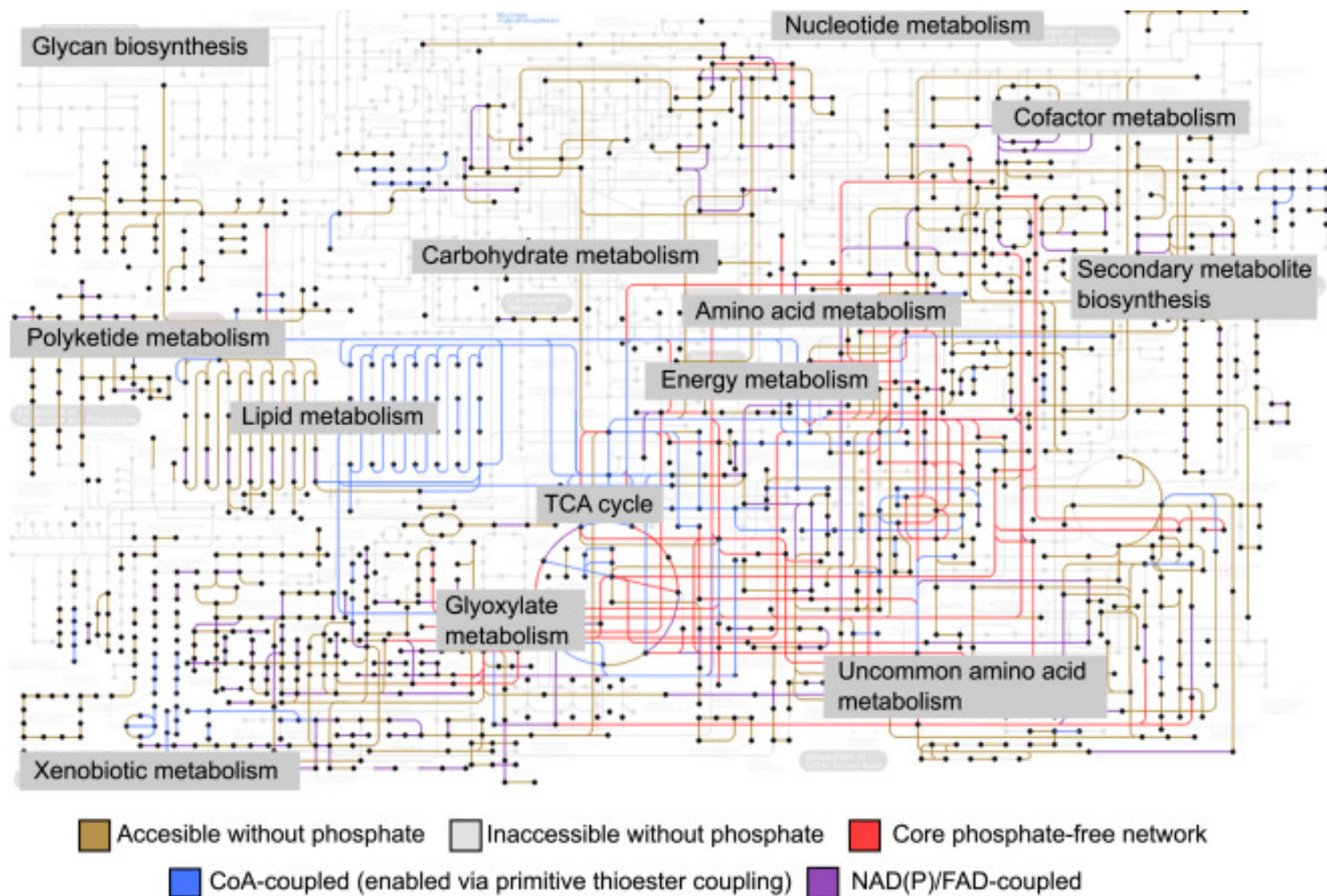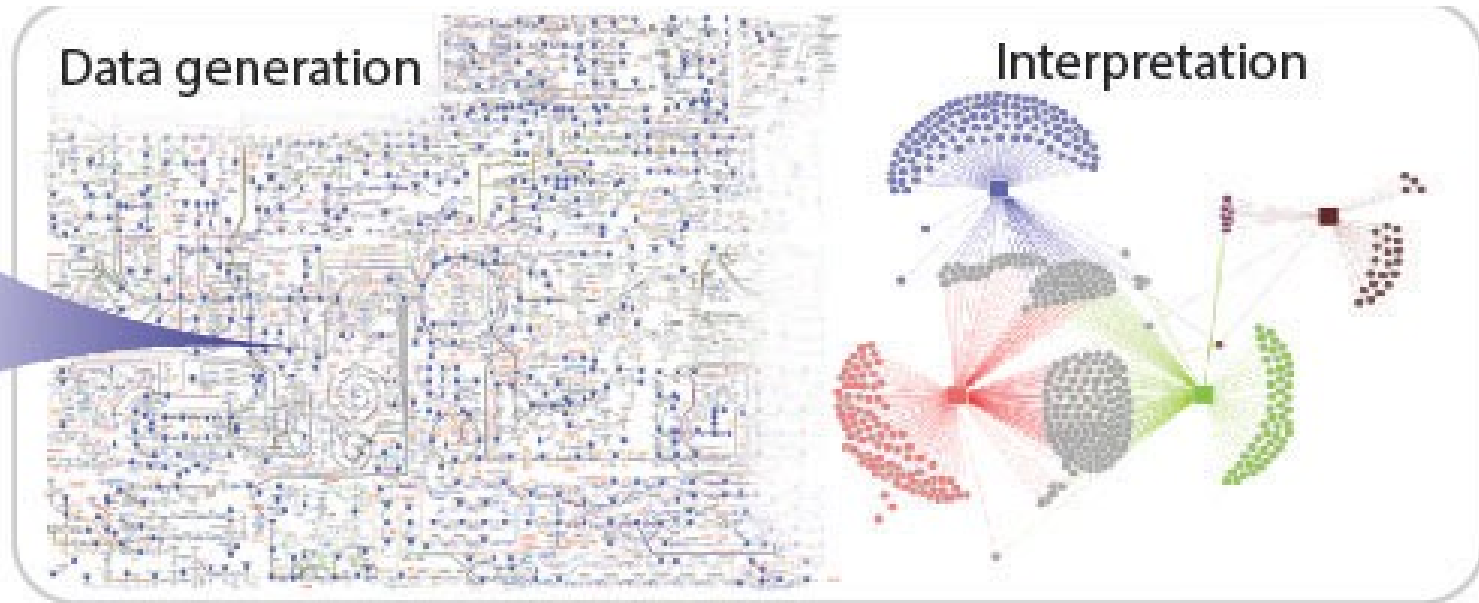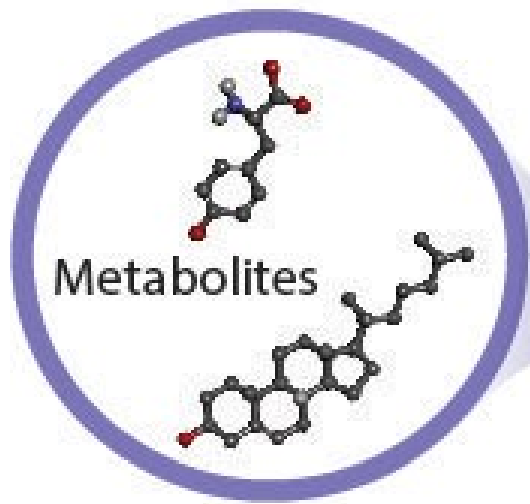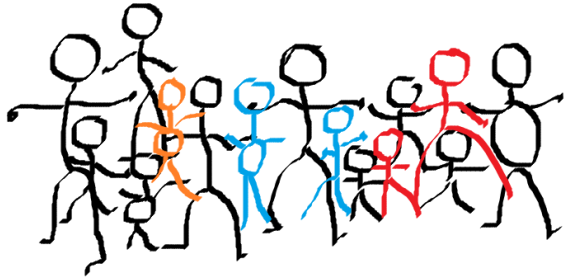

Environment and lifestyle

Phenotype

Genetics

Metabolism

Glycan biosynthesis

Nucleotide metabolism

Cofactor metabolism

Carbohydrate metabolism

Amino acid metabolism

Secondary metabolite biosynthesis

Polyketide metabolism

Energy metabolism

Lipid metabolism

TCA cycle

Glyoxylate metabolism

Uncommon amino acid metabolism

Xenobiotic metabolism

Accesible without phosphate   Inaccessible without phosphate   Core phosphate-free network

CoA-coupled (enabled via primitive thioester coupling)   NAD(P)/FAD-coupled

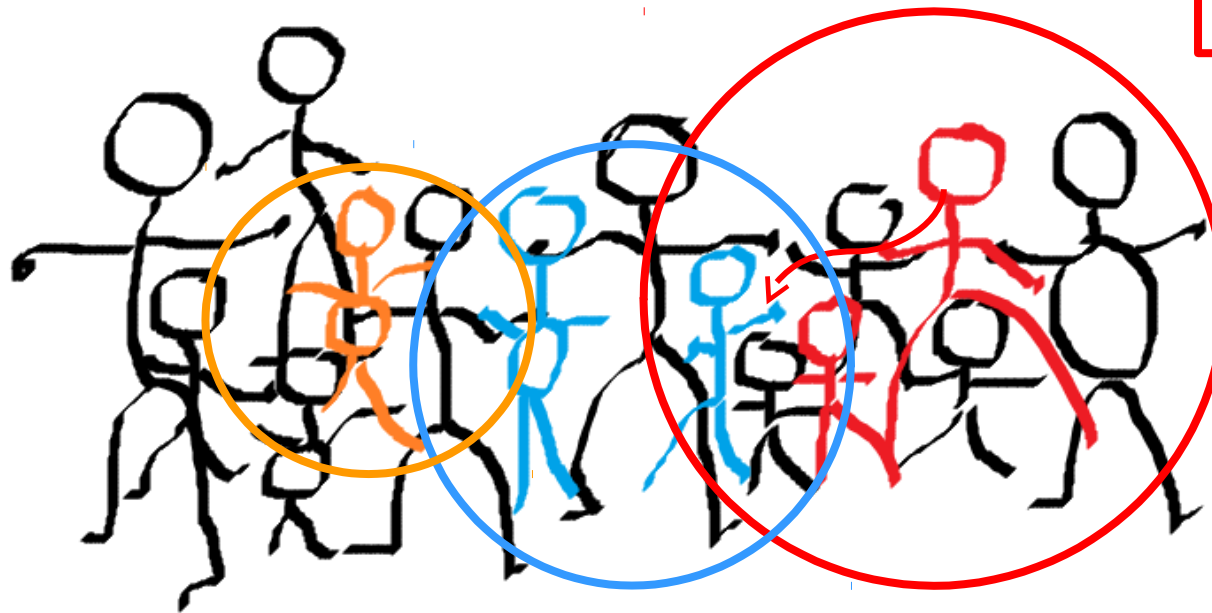# Metabolomics

Disease A

Disease B
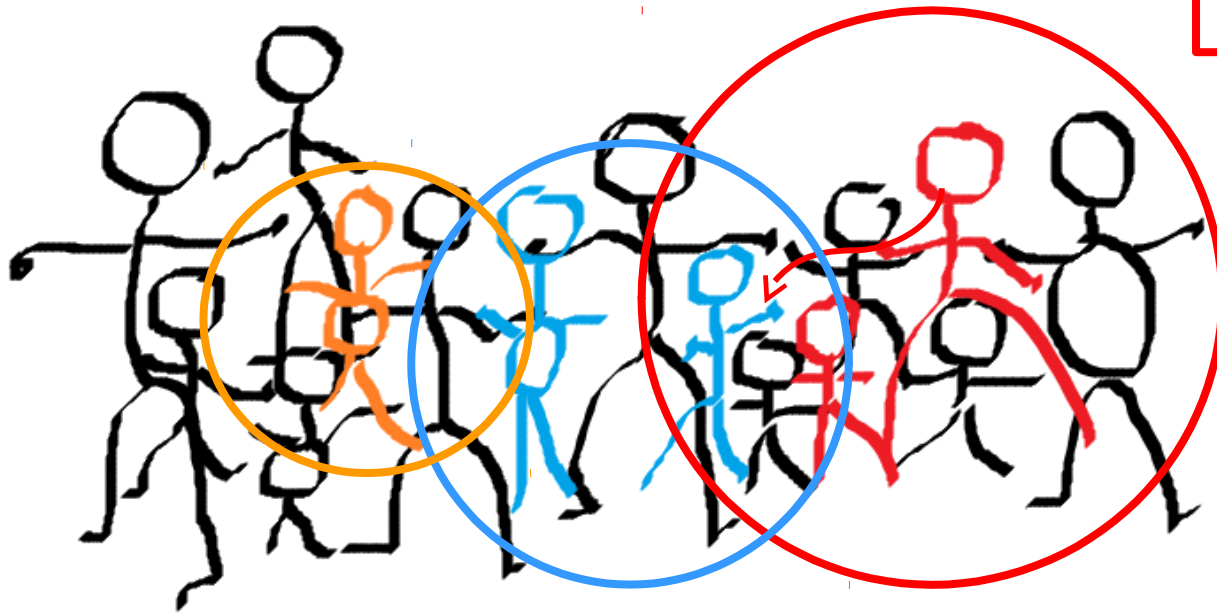
Disease C

Phenotype

Biomarker A
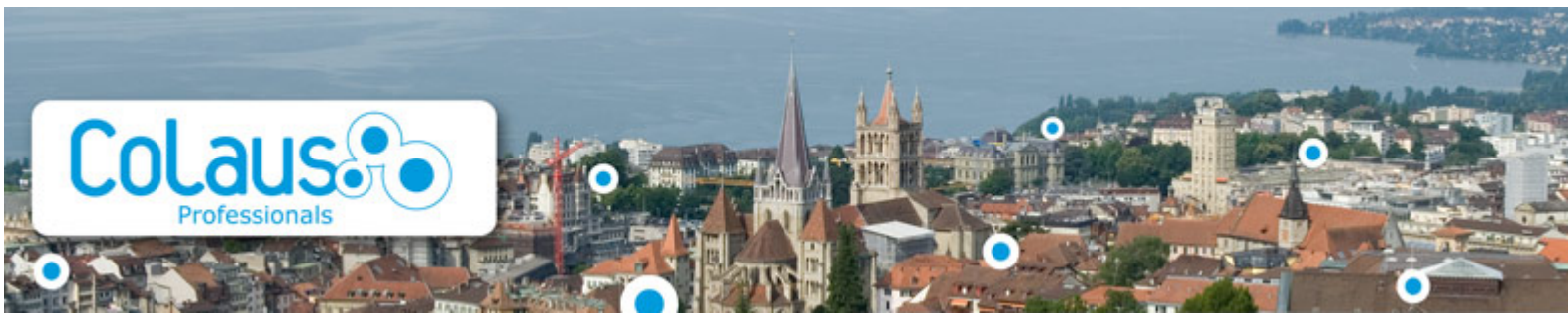
Biomarker B

Biomarker C

Phenotype
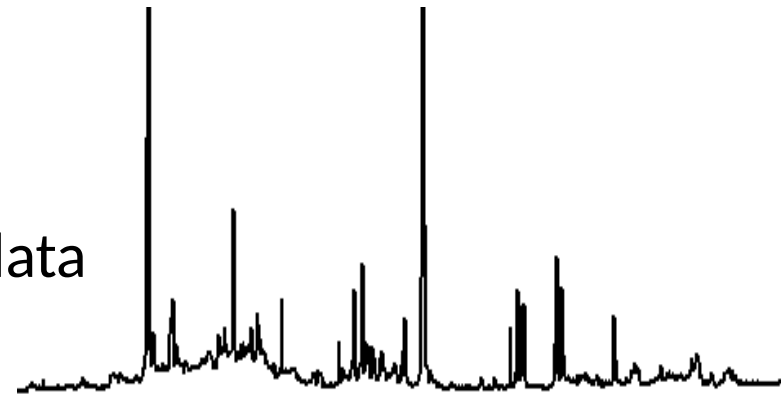
Data

- Phenotype
  - Disease of interest (Cardiovascular disease, diabetes...)
  - Other phenotypes?

- Metabolomics (835 urine samples)
  - Nuclear magnetic resonance (NMR) data

Goals

- **Analyze NMR data using R**
  - Group individuals with similar metabolomics profile
  - Identify metabolites as biomarkers

- **Tools**
  - Clustering methods
  - Linear regression analysis

Thank you!

Questions?