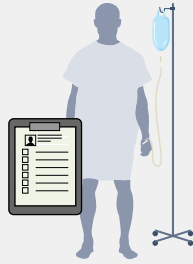


A. MULTIOMICS DATA INPUTS AND COLLECTION



Environmental information



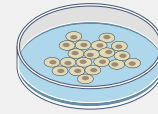
Clinical data



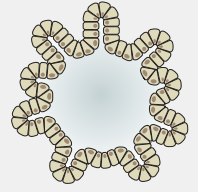
Clinical samples



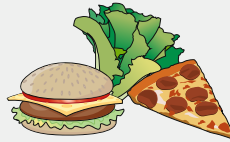
Animal models



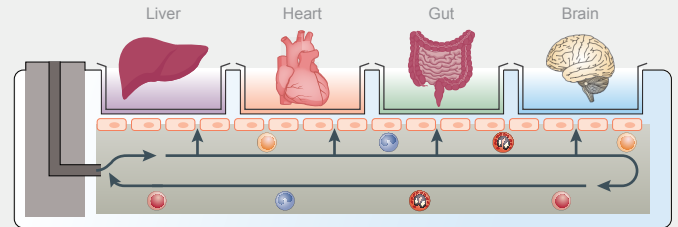
Cell culture



Organoids



Dietary information



Organs-on-chips

B. MULTIOMICS TECHNOLOGIES AND THEIR MOLECULAR SIGNATURES



Transcriptomics

- Transcript abundance
- RNA post-transcriptional regulation
- Non-coding RNA profiling
- MicroRNA profiling
- Transcriptional programmes
- Predictive host response
- Biomarkers and diagnostics



Epigenomics

- DNA modification
- RNA modification
- Chromatin structure
- Chromatin accessibility
- Chromatin modification



Genomics

- Epistasi
- Loss of function
- Gain of function
- Genetic interaction mapping



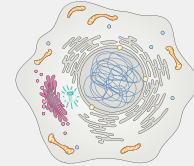
Proteomics

- Protein abundance
- Post-translational modification profiling
- Protein-protein interactions
- Protein structure and dynamics
- Biomarkers and diagnostics



Metabolomics/ lipidomics

- Metabolite profiling
- Lipid profiling
- Drug screening
- Biomarkers and diagnostics



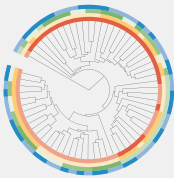
Cellomics

- Tissue composition
- Cell trafficking
- Macromolecule tracking
- Intracellular localization
- Infection dynamics

C. MULTIOMICS DATA ANALYSIS



Data exploration



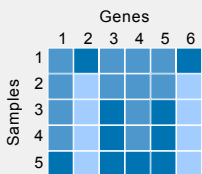
Data clustering



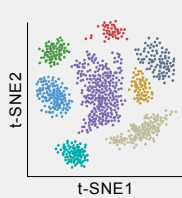
Network mapping



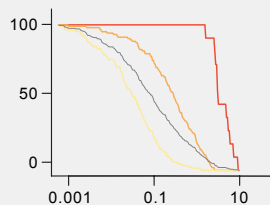
Enrichment
analysis



Gene expression analysis

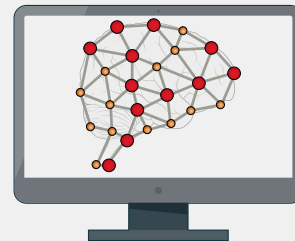


Dimensionality
reduction



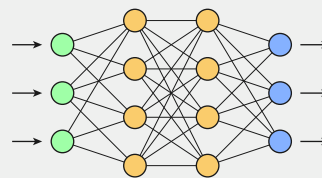
Statistical analysis

D. AI-BASED MULTIOMICS DATA INTEGRATION AND VALIDATION

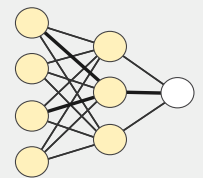


Machine learning

- Reinforced learning
- Supervised learning
- Unsupervised learning
- Semi-supervised learning



Deep learning



Prediction model