Computational strategies in cardiometabolic diseases

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Propositions

Belonging to the thesis

Computational Strategies in Cardiometabolic Diseases:
a Portal to Deeper Mechanistic Understanding

1. Compared to single-cell transcriptomics data, spatially resolved omics data also enable an analysis of cell heterogeneity, while retaining information about the cell's location and microenvironment in the tissue (this thesis).

2. A comprehensive understanding of the pathogenesis of CVD requires dissection at multiple molecular levels, including genomic, transcriptomic, proteomic, and metabolomic levels (this thesis).

3. Spatio-temporal analysis of NAFLD demonstrates the presence of spatial- and temporal-specific metabolites, which greatly aids in the discovery of reliable compartment-specific biomarkers, and understanding of the metabolic trajectory throughout pathogenesis (this thesis).

4. Using public database resources as prior knowledge to infer cytokine and TF activity from sex-biased gene expression profiles of CAD patients and healthy individuals can provide insight into the different manifestations and pathogenesis of CVD in men and women (this thesis).

5. High diastolic blood pressure in coronary artery disease dampens the monocytes' response to LPS, an effect that can potentially be reversed by the prostaglandin I2 analog iloprost (this thesis).

6. When the outcome of a particular bioinformatics analysis is disappointing, blindly switching to another package is not going to solve the problem. You should rather go back to check your data and dissect the approaches you currently used.

7. Data scientists and bioinformaticians should apply the following three rules when collaborating with biologists: (1) do not try to be a biologist; (2) do not force biologists to think in computational terms; (3) describe your problems as simply as possible.

8. Don't waste your time caring about what others think about you. Always stay confident and be your authentic self.

9. No arrogance in victory, no discouragement in defeat.

10. If something is too difficult to accomplish, you could just give it up and move on to another goal.

Chang Lu
Heidelberg, 25th October 2022