Case study 1

- You would like to evaluate the impact of a fruit extract on biological age.

- What experiment / strategy would you propose to:

- Build a biological clock from scratch?
- Test the effect of the fruit juice?

Case study 2

- You would like to build a pangenome for plant species: coffea Robusta
- How would you proceed to select the plants for your pangenome?
- How would you practically proceed to sequence, assemble and annotate the genomes?

Case study 3

- A clinical trail with a specific dietary intake is performed exclusively with twin subjects, one with normal weight and the other underweighted. A significant fraction of subjects underweighted react by gaining weight, while the rest of the cohort does not show any change in weight.

- How can you proceed to identify the mechanism responsible for this observation? And how could identify markers that would predict the response for a personalized / precision treatment?

Case study 4

- A scientist visiting a totally remote area has discovered a new tribe. She is interested in understanding the origin of the tribe, and the link between their nutrition habit and their health.

- How would you proceed to identify the genetic origin of the tribe?
- What experimental design would you propose to understand the cause of their health?

Case study 5

- You have identified that numerous repetitive regions of various respective lengths are suspected to contain variants that could be associated with susceptibility to a metabolic disorder.

- How would you proceed to identify them in a research project?
- How would you design a test simple to use for clinical diagnostic?

Case study 6

- You would like to characterize as completely as possible the genome, transcriptome and proteome of a new model organism (mammalian) which has tremendous advantages for the study of metabolic disorders.
- How would you proceed steps by steps?
- Which approach could you envisage to create a population of this organism with genetic diversity to identify genes involved in metabolic disorders?