Programme de Formation

Beginner's guide to AlphaFold : structural prediction of proteins and biological assemblies

Organisation

Durée : 14 heures

Mode d'organisation : Présentiel

Contenu pédagogique

Public visé

PhD students, postdoctoral researchers, researchers, engineers and technicians in biology or bioinformatics, from both academic and non-academic backgrounds, who hold a three-year degree and have a basic theoretical understanding of molecular biology, and who wish to apply structure prediction to their research but have little or no experience in structural bioinformatics.

Objectifs pédagogiques

By the end of the course, participants will be able to use biological prediction tools effectively, interpret and utilise their results to answer scientific questions, whilst recognising their limitations and applying these skills to their own case studies.

- Be familiar with the various prediction tools available
- Interpret the output from prediction tools such as AlphaFold
- Use these tools to address a biological question
- Understand the limitations of prediction tools such as AlphaFold
- Apply this knowledge to your own case study

Description

Day 1

- Morning:
  - Introduction of the speekers and participants
  - Introduction to protein structures and databases (theory)
  - Getting started with the ChimeraX visualisation tool (theory + practical)

- Afternon:
  - Introduction to AlphaFold and similar prediction tools and to how they work (theory)
  - Presentation of the common output prediction scores and how to evaluate your models (theory + practical)

Day 2

- Morning
  - Going beyond simple prediction: integrating conservation information, searching for similar structures with FoldSeek, going up to the proteome scale, … (theory + practical)
  - Current status and limitations of prediction methods (theory)

- Afternoon:
  - Working on participant's case studies, Q&A (practical)
  - Conclusion, feedback and discussion The whole pedagogic team

Prérequis

- Qualifications: Bachelor's degree or equivalent
- Knowledge: Basic knowledge of molecular biology

Modalités pédagogiques

Lectures (30%), practical sessions, and trainees' case studies (70%)

Moyens et supports pédagogiques

Files in PDF format will be made available to the trainees.

Equipment:

- Trainees must bring a laptop (minimum specifications: 8 GB RAM, Linux/Windows/macOS) capable of connecting to the internet (via Eduroam or the I2BC Guest WiFi) with ChimeraX 12.1 installed
- A Google account is required to use the AlphaFold3 server and Colabfold online

Modalités d'évaluation et de suivi

Practical exercises, short quizzes within the theoretical presentations.

Ongoing formative assessments throughout the course. A certificate of completion is issued at the end of the training.

Informations sur l'admission

Admission is subject to the review of an application, involving the completion of a questionnaire in which candidates assess their own standing and outline their motivation for and interest in the program. Enrollment is confirmed following a favorable assessment by the teaching team.

Informations sur l'accessibilité

Our organisation is committed to ensuring inclusive and equitable access to its training programmes, whether delivered online or in person, for all participants, including people with disabilities. A dedicated accessibility contact is available to assess individual needs and, where possible, implement appropriate pedagogical, technical and organisational adjustments.