



Bring-Your-Own-Single-Cell-Data Hackathon on Mechanistic Modelling

Single-cell (SC) data are massively enriching our view of dynamic cellular systems, yet most analyses remain descriptive. This workshop introduces **ordinary differential-equation (ODE) modelling** as a quantitative extension of SC studies. Participants will learn to integrate cell-state frequency trajectories into mechanistic models using the open-source R packages. Guided practicals will cover data integration, parameter estimation, identifiability analysis and visualisation of results. The programme combines brief theory capsules with extended hacking sessions, enabling each participant to generate preliminary kinetic parameters – either for their own dataset or for benchmark data supplied by the organisers. The course builds on a published conceptual framework: <https://www.nature.com/articles/s41540-024-00395-9>

When	Wed - Thu, 5-6 Nov 2025
Where	Hamburg Center for Translational Immunology (HCTI) at the University Medical Center Hamburg-Eppendorf (UKE), Hamburg, Germany
Seats	Max. 12
Eligibility	Natural/ Life science PhD students & postdocs <ul style="list-style-type: none"> • with advanced R and single-cell analysis experience • enrolled at one of the nine EUGLOH member universities (or affiliated partner institutions)
Focus Area	Digital Health, AI & Medical Technology
Selection	<ul style="list-style-type: none"> • Motivation statement & CV with a list of publications • completed five-minute homework (for self-assessment)
Bring along	<ul style="list-style-type: none"> • computer with running dMod / cODE packages • three-minute pitch about own work and/or dataset • optional: published single-cell dataset of interest (otherwise a dataset will be provided by the workshop organisers)
Costs	Travel and accommodation costs will be covered for participants from EUGLOH member universities, with funding from the German Federal Ministry of Research, Technology and Space.

Why participate?

- **Instant added value for your science** – obtain quantitative (and therefore interpretable) turnover and/or differentiation rates in your system of interest!
- **Hands-on with open-source practice** ([dMod](#) & [cOde](#), [scIBDmod](#)) to further develop your own analysis routines.
- **Soft skills on the go**: from data visualization, benchmarking and reproducibility analysis to preliminary data generation and scientific writing for grant and fellowship applications.
- **Collaboration & authorship**: promising results may result in a co-authorship for a later methodological paper with the Adlung Lab.

Instructor bio sketch

Lorenz Adlung is an independent junior group leader at the Hamburg Center for Translational Immunology (HCTI) and affiliated with the Center for Biomedical AI (bAlome) at the University Medical Center Hamburg-Eppendorf (UKE). The Adlung Lab combines quantitative data generation with computational modelling. Among other awards, Lorenz received the BioModels Model of the Year Award in 2023 from EMBL-EBI and the Dr. Liselotte Brauns Research Prize for Internal Medicine in 2024. Lorenz works as a freelancing lecturer for the National Institute for Science Communication (NaWik).

Preliminary programme

First Day

1. Welcome
2. Short introduction into key concepts behind SC data and ODE-based modelling
3. Setup of dMod framework, read-in data, run simulations (1.5h)
4. Model selection (1.5h)
5. Dinner

Second Day

1. Soft skill tips and tricks (feat. EU office)
2. Short introduction into parameter estimation
3. Identification analysis (4h)
4. Wrap-up and summary of lessons learned
5. Networking closure: local PIs present themselves to the international guests

Selection criteria

- Priority will be given to applicants who have *not* participated in EUGLOH events previously
- **Motivation** is key: Provide a three-sentence motivation statement why we must select you

How to apply? Complete the homework for self-assessment and submit your three-sentence motivation statement together with your CV via the online registration form at <https://www.conferences.uni-hamburg.de/e/sc2ode> by August 30.

Timeline

- **July 14:** Call opens
- **August 30:** Submission deadline for applications
- **September 15:** Final selection
- **October 20:** First E-meet with project & data pitches



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