CHAIR FOR
CLINICAL
BIOINFORMATICS
SAARLAND UNIVERSITY

# SEMINAR SINGLE-CELL RNA SEQUENCING – KICK-OFF MEETING

Tutor:
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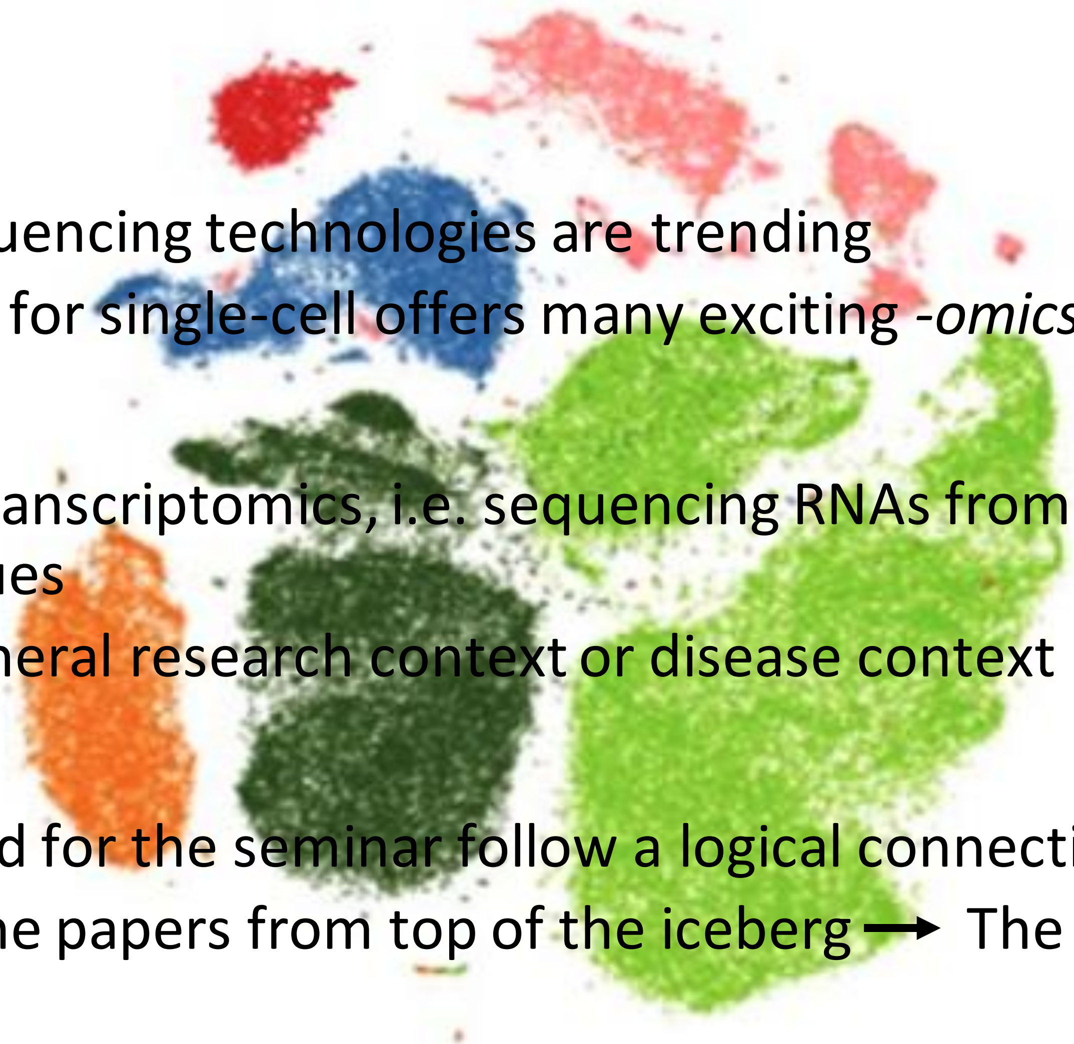
# Welcome

**Thanks for enrolling!**

# ABOUT THIS COURSE



- Why?
  - Single-cell sequencing technologies are trending
  - Bioinformatics for single-cell offers many exciting *-omics* applications
- What?
  - We focus on transcriptomics, i.e. sequencing RNAs from populations of cell types and tissues
  - Can be in a general research context or disease context
- How?
  - Papers selected for the seminar follow a logical connection & ordering
  - We selected the papers from top of the iceberg → The field is moving fast!

# PREREQUISITES

- Seminar (Master‘s only, 7 CPs - graded):
    - No formal prerequisites
    - But good skills in **maths, programming, and bioinformatics** are assumed
- Good english skills as **all talks** will be held in english language!

# AVAILABLE TOPICS COVER THE ENTIRE SINGLE-CELL RNA DATA EVALUATION PIPELINE

**1:** Systematic comparison of single-cell and single-nucleus RNA-sequencing methods (Sili Vettiyara Sunil)

**2:** zUMIs – A fast and flexible pipeline to process RNA sequencing data with UMIs (Berit Andres)

**3:** Modular and efficient pre-processing of single-cell RNA-seq (Iyanuoluwani Owolabi)

**4:** Bias, robustness and scalability in single-cell differential expression analysis (DEBANGANA CHAKRABORTY)

**5:** Classification of low quality cells from single-cell RNA-seq data (Baris Kalem)

**6:** Supervised classification enables rapid annotation of cell atlases (Johanna Elena Schmitz)

**7:** The dynamics and regulators of cell fate decisions are revealed by pseudotemporal ordering of single cells **(**Ipshita Kanungo)

**8:** RNA velocity of single cells (Muhammad Hamid)

**9:** Inference and analysis of cell-cell communication using CellChat (Shusruto Rishik)

**10:** Benchmarking algorithms for gene regulatory network inference from single-cell transcriptomic data (Hsin Yu Wu)

**All papers should be freely accessible via the university VPN**

# COURSE SCHEDULE

| Event | Time | Comments |
|---|---|---|
| Registration | 26.04.2021 - 16.05.2021 | |
| Kick-off meeting [mandatory] | Today (08.06.2021) | Remote |
| Deadline to register in HISPOS OR de-register from seminar [mandatory] | 29.06.2021 | 3 weeks after the kick-off meeting |
| Deadline for feedback [optional] | 06.09.2021 | 1 week before the presentations |
| Presentations | 13.09 / 14.09.2021 | Remote (Microsoft Teams) |
| Summary submission deadline | 20.09.2021 | 1 week after the presentations |

**Meetings are performed remotely via Microsoft Teams**

# HOW TO PASS THE COURSE

**Certificate requirements:**

1. Successful presentation:
    - Talk: **30 minutes** for a Proseminar and **40 minutes** for a Seminar
    - Discussion: **5 minutes** during which you should be able to answer questions from the tutors/audience
2. Attendance to all presentations is **mandatory**
3. Submitting a summary report:
    - Short description of the presented topic(s)
    - Ca. 2 pages of text, excluding title (page), references, figures, tables etc..
    - No figures, tables or formulas required
    - Main structure: title page, main text (with or without subsections), references
    - It is recommended to write the report using LaTeX to train scientific writing

**Final grade:**

- Primarily based on the given presentation & follow-up discussion
- Might be influenced by the quality of the submitted summary report

Most importantly:

Practice!

But also:

- Try to reduce the amount of text
  - prevent showing entire sentences
  - use figures or visualizations provided by the literature
- Rule of thumb:
  you should be able to explain everything that's shown on your slides
- Proof-read your slides
- Speak freely and do not use cheat sheets

## We expect you to:

- Read our presentation guidelines:
  https://www.ccb.uni-saarland.de/wp-content/uploads/2017/01/guidelines.pdf
- Fill-out and send the presentation checklist along with your slides:
  https://www.ccb.uni-saarland.de/wp-content/uploads/2014/09/presentation_guidelines.pdf
- Ask for feedback or formulate questions whenever you are stuck
- Independently use the available literature to enhance your knowledge on the assigned topic
  - *See also our **recommended reading** literature on the course site!*

CLOSING

# Any questions?

https://www.ccb.uni-saarland.de/teaching/seminar-single-cell-rna-sequencing-summer-term-2021/

# HIWI POSITION

CHAIR FOR CLINICAL BIOINFORMATICS
SAARLAND UNIVERSITY

@ KIST Europe

Deep learning Project with ChEMBL database

Contact for further information or questions

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