LMU KLINIKUM
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HELMHOLTZ MUNICH

KimHellmuth Lab

DR. VON HAUNERSCHES KINDERSPITAL
Helfen Forschen Heilen. Seit 1846

Hands-on Biological Data Science with R

Introduction

About Us
Kim - Hellmuth Lab

International and Interdisciplinary Team

- We’re a diverse group of people with various backgrounds in all levels, combined with in our shared passion for this field.

Translational Immunogenomics Focus

- We explore the genetic basis of human immune response variation, with the aim of utilizing those insights in the clinic.

Dual Affiliation with Helmholtz Munich & LMU

- We are based both at Helmholtz Munich Computational Health Center and LMU Hospital.

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If you are interested - Reach Out !

We always welcome enthusiasts who wants to pursue opportunities in our lab, and thanks to our interdisciplinary work, we can offer a range of projects from wet lab to dry lab for all levels.

You can

- **“Forschungsmodul” LMU**
- **Internships**
- **HiWi positions**
- **MD Thesis …**

What comes to mind when you think of Biological Data Science?

https://www.menti.com/alk8qmgqdg9s


Look at all of this data! Tons of it!
Yes, but what does it all mean? Too much of a good thing isn't always a good thing. Data without meaning... is just data.
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Lecture schedule

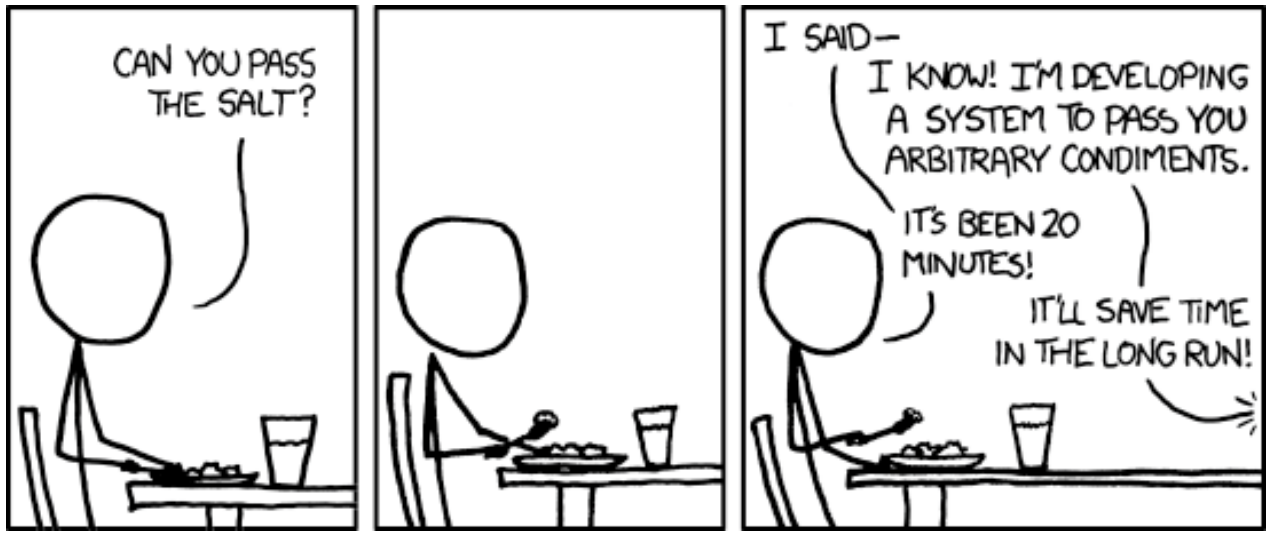
WiSe 2025/2026

Year	Calendar Week	Dates (Mon–Fri)	Lecture Week	Day, Time *	Session	Material(s)	Learning Outcomes
2025	KW 42	13.10. – 17.10.	**Week 1**	Wed., 15.00	Introduction (in person, obligatory)	- w1_1_introduction.pptx - w1_2_installing_R_RStudio.pptx - w1_installing_R.html	- Introduction to the lesson plan - Installing R and RStudio - Learning to install and upload packages
	KW 43	20.10. – 24.10.	**Week 2**		**Self study**	- w2_1_first_operations_R.html - w2_2_advanced_R_tidyverse.html - w2_exercise_1.pptx	- Data types, data structures, reading/writing data, basic plotting - Data transformation, functions, complex plotting
	KW 44	27.10. – 31.10.	**Week 3**				
	KW 45	03.11. – 07.11.	**Week 4**				**- Exercise 1 due Week 4 Friday midnight**
	KW 46	10.11. – 14.11.	**Week 5**	Wed., 15.00	Exercise 1 Tutorial (zoom)	- solutions_exercises1.html	
	KW 47	17.11. – 21.11.	**Week 6**		**Self study**	- w6_statistics.pptx - w6_exercise_2.pptx	- Meaning of p-value, normal distribution, confidence intervals - Performing basic statistical operations in R
	KW 48	24.11. – 28.11.	**Week 7**				
	KW 49	01.12. – 05.12.	**Week 8**				**- Exercise 2 due Week 8 Friday midnight**
	KW 50	08.12. – 12.12.	**Week 9**	Wed., 15.00	Exercise 2 Tutorial + Introduction to Genetics (zoom)	- solutions_exercises2.html - intro_to_complex_genetics.pptx - exercises3.pptx	- Introduction to complex genetics & GWAS - Association interpretation for GWAS - GWAS results plotting
	KW 51	15.12. – 19.12.	**Week 10**				
	KW 52	22.12. – 26.12.	**Week 11**				
2026	KW 1	29.12. – 02.01.	**Week 12**				**- Exercise 3 due Week 12 Friday midnight**
	KW 2	05.01. – 09.01.	**Week 13**		**Self study**	- solutions_exercises3.html - final_assignments.pptx	- Data wrangling, GWAS results interpretation, plotting - Literature review, presentation prep
	KW 3	12.01. – 16.01.	**Week 14**				
	KW 4	19.01. – 23.01.	**Week 15**				
	KW 5	26.01. – 30.01.	**Week 16**				**- Final assignments due Week 16 Friday midnight**
	KW 6	02.02. – 06.02.	**Week 17**	Wed., 15.00	Final Presentations (in person, obligatory)		

Exercises and final assessment

WiSe 2025/2026

- All self-study materials and exercises will be uploaded **in moodle.**
- **Beware of deadlines** for submitting your exercises.
- **When you feel like stuck,** reach out to your classmates, use the Forum in Moodle or look for the answers in the Web/Stack Overflow (and ChatGPT, although be aware of it's limitations)
- **Final assessment:** Preparing a presentation of biological data science task.
- **Optional for bonus credit:** Prepare a short summary (max. 2 slides as part of your final presentation) about a modern method in human genetics (e.g. single cell-seq, ATAC-seq, PheWAS, QTLs). (will count as a extra exercise)



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Thanks for your attention!

Contacts:

Ekin Yaman
Kim-Hellmuth
✉: Ekin.Yaman@med.uni-muenchen.de

Dr. med. Sarah

https://www.ccrc-hauner.de/kim-hellmuth-labor

Dr. med. Paula Rothämel
✉: Paula.Rothaemel@med.uni-muenchen.de