

## PhD Journal Club “Method and Logic in Biology” 2024/2025

### Syllabus

#### Time & Venue

##### Kick-off Journal Club:

Wednesday, 8 October 2024, 09:00 – 13:00, MPI AGE, seminar room 1 (ground floor)

##### Regular Journal Clubs:

Thursdays *or tba*, 12:30 – 14:30, MPI AGE, seminar room 1 or *tba*

#### Dates and Chaperones

##### Kick-off Meeting on “Hallmarks of aging: An expanding universe”:

09.10.2023: Dr. Sebastian Grönke

##### Regular Journal Clubs (corresponding lecture):

- 1) 31 Oct. 2024 Dr. Joris Deelen (*General Introduction to Ageing*)
- 2) 14 Nov. 2024 Dr. Jane Reznick (*Model Systems of Ageing*)
- 3) 28 Nov. 2024 Prof. Matteo Bergami (*Metabolic Mechanisms interfacing with the Brain in Ageing - exact title tbd*)
- 4) 12 Dec. 2024 -
- 5) 16 Jan. 2025 Dr. Hans-Georg Sprenger (*Mitochondrial Dysfunction in Disease and Ageing*)
- 6) 23 Jan. 2025 Dr. Hannah Scheiblich (*Differential Vulnerability in Neurodegeneration*)
- 7) 13 Feb. 2025 Dr. Stephanie Panier (*ADP-Ribosylation in the DNA-Damage Response and Ageing*)
- 8) 06 Mar. 2025 Dr. Milica Popovic / Trifunovic Lab (*Stress Signaling in Development, Homeostasis and Disease*)
- 9) 20 Mar. 2025 Dr. Thanh Vuong-Brender / Schumacher Lab (*Telomeres and Ageing*)

- 10) 03 Apr. 2025 Dr. Seda Koyuncu / Vilchez Lab (*Protein Homeostasis*)
- 11) 11 Apr. 2025 (Friday) Dr. Santiago Serrano-Saénz / Walczak Lab (*Cell Death and Cancer Evolution*)
- 12) 08 May 2025 Dr. Corinna Bauder / Brüning Lab (*Dysregulated Metabolism and Ageing-Associated Disorders*) – Room changed to Meeting Room 2, 2<sup>nd</sup> floor, MPI AGE
- 13) 22 May 2025 Dr. Sarah Kreuz / Antebi Lab (*Metabolic and Nutrient Signaling in Ageing and Disease*)

## Papers

- 1) 31 Oct. 2024 *Organ aging signatures in the plasma proteome track health and disease*, Oh et al. **2023**, Nature  
<https://www.nature.com/articles/s41586-023-06802-1>
- 2) 14 Nov. 2024 *The extracellular matrix integrates mitochondrial homeostasis*, Zhang et al. **2024**, Cell  
<https://doi.org/10.1016/j.cell.2024.05.057>
- 3) 28 Nov. 2024 *Mitochondria metabolism sets the species-specific tempo of neuronal development*, Iwata et al. **2023**, Science  
<https://www.science.org/doi/10.1126/science.abn4705>
- 4) 12 Dec. 2024 -
- 5) 16 Jan. 2025 *Resveratrol Improves Mitochondrial Function and Protects against Metabolic Disease by Activating SIRT1 and PGC-1 $\alpha$* , Lagouge et al. **2006**, Cell  
<https://doi.org/10.1016/j.cell.2006.11.013>
- 6) 23 Jan. 2025 *Trem2 expression in microglia is required to maintain normal neuronal bioenergetics during development*, Tagliatti et al. **2024**, Immunity  
<https://doi.org/10.1016/j.immuni.2023.12.002>
- 7) 13 Feb. 2025 *Telomeric DNA damage is irreparable and causes persistent DNA-damage-response activation*, Fumagalli et al. **2012**, Nature Cell Biology  
<https://www.nature.com/articles/ncb2466>

- 8) 06 Mar. 2025 *Fibroblast Growth Factor 21 Drives Dynamics of Local and Systemic Stress Responses in Mitochondrial Myopathy with mtDNA Deletions*, Forsström et al. **2019**, Cell Metabolism  
<https://www.sciencedirect.com/science/article/pii/S1550413119304486>
  
- 9) 20 Mar. 2025 *Somatic mutation as an explanation for epigenetic aging*, Koch et al. **2025**, Nature Aging – Please note the **change of paper!**  
<https://www.nature.com/articles/s43587-024-00794-x>
  
- 10) 03 Apr. 2025 *Stress response silencing by an E3 ligase mutated in neurodegeneration*, Haakonson et al. **2024**, Nature  
<https://www.nature.com/articles/s41586-023-06985-7>
  
- 11) 11 Apr. 2025 *Integration of innate immune signalling by caspase-8 cleavage of N4BP1*, Gitlin et al. **2020**, Nature  
(Friday)  
<https://www.nature.com/articles/s41586-020-2796-5>
  
- 12) 08 May 2025 *DMH<sup>Ppp1r17</sup> neurons regulate aging and lifespan in mice through hypothalamic-adipose inter-tissue communication*, Tokizane et al. **2024**, Cell Metabolism  
<https://doi.org/10.1016/j.cmet.2023.12.011>
  
- 13) 22 May 2025 *Hexosamine Pathway Activation Improves Protein Homeostasis through the Integrated Stress Response*, Horn et al. **2020**, iScience  
<https://doi.org/10.1016/j.isci.2020.100887>

## Course Description

Each journal club session will be taught by a faculty member. One current or classic paper with strong relevance in the field of ageing research will be discussed per session. You will receive all publications in advance in order to have sufficient time for preparation. For each paper, one student will be in charge of outlining the major hypothesis and summarizing the results, concluding statements and posing future directions (15 min). All other students will be responsible for describing, but most importantly for critically analyzing 1 - 2 figures per paper (~5 min). After the presentations, the respective paper will be extensively discussed (~20 min) by the group and the chaperone will give feedback to the whole group on their performance. Individual performance will be evaluated by the chaperones and the feedback will be handed out to the students at a later stage.

## Course Objective

The journal club aims to teach you critical thinking skills. Moreover, it provides an overview of current literature and classical publications. You are strongly encouraged to actively participate. PIs should strongly emphasize the use of questions as a rhetorical and narrative device that drives

the science. Therefore, you should present the depicted hypotheses being tested as questions, the content of each figure should first be posed as a question. PIs are expected to play an active role in challenge the students and raising critical points that they might have been missed.

## Guidelines for presenting a paper

- What is the overall hypothesis being tested in the paper?
- What approach did the authors use to address the hypothesis?
- What is the result and why is it important?
- Are new research questions raised by the work in the paper?
- Are there alternatives? Limitations of each approach?
- What are the major findings?
- Did you see patterns or trends in the data that the author did not mention?
- Are the conclusions drawn from the results justified?
- Are there appropriate controls?
- Are there other factors that could have influenced the results?
- Were the hypotheses adequately tested?
- If you were to continue this research, what would you do next and how?