KJELDGAARD Lecture - Prof. Dr. Björn Schumacher

Tuesday 19 September 2023 at 13:15 —14:00

Followed by PhD-session at 14:30 —15:00

(Coffee and cake will be served between lecture and PhD-session)

1871-120 (MBG-auditorium)

Host: Tinna Stevnsner

Prof. Dr. Björn Schumacher

- Head of Research
- Institute for Genome Stability in Aging and Disease
  Faculty of Medicine, University of Cologne

Genome Stability in aging and inheritance: new insights from *C. elegans*

The demographic change is one of the greatest challenges of our time. Age is the biggest risk factor for a wide range of chronic diseases including dementia, cardiovascular diseases, cancer, and frailty. It is therefore of utmost importance to understand the biology of aging. While the soma ages over the course of an individual's lifespan, germ cells can be indefinitely perpetuated.

The genome contains all information for building and maintaining cells, tissues and thus the organism. The DNA is constantly exposed to damage but, in contrast to any other macromolecules, it cannot be replaced but instead requires constant repair. DNA repair mechanisms are thus essential for life and the maintenance of health. DNA repair defects accelerate human aging in rare progeroid syndromes. While the DNA in somatic tissues only needs to be maintained for an individual's lifespan, germline genomes require indefinite maintenance. We will here discuss new concepts of genome maintenance mechanisms in the germline.

I will first show how somatic stress can impact genetic inheritance in the female germline. Second, we uncovered a novel mechanism of the specific consequences of paternal DNA damage and the restrictive repair types fueling genome instability in the consequent generation. Third, we propose the DREAM complex as the first master regulator of somatic DNA repair capacities whose inhibition could augment genome maintenance thus alleviating a fundamental cause of aging.