Daniele Barthel and K. Lenhard Rudolph

With its outstanding research results the FLI plays an important role within the cooperative science community of the Leibniz Association, e.g. in the Research Alliance Healthy Ageing.

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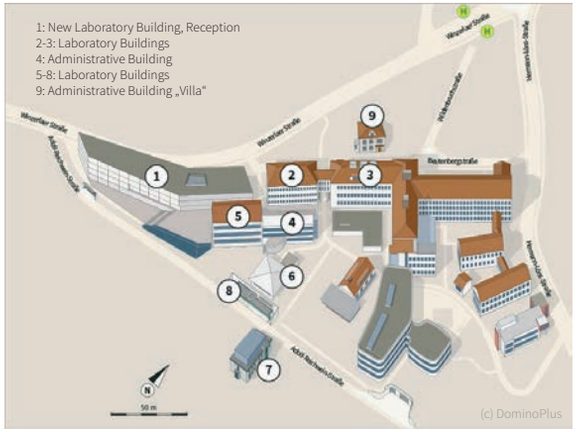


Leibniz Institute on Aging –
Fritz Lipmann Institute

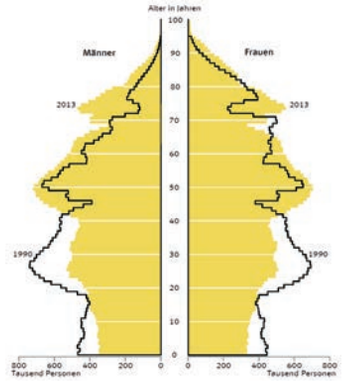
Focus of Research

Aging Research in Jena

Our Profile

“Demographic change is one of the great challenges of our time but it offers great opportunities as well.”

Prof. Dr. K. Lenhard Rudolph



Population Structure 1990 vs. 2013
Reference: German Federal Statistical Office

Research Aim

The main aim of our research at the FLI is to delineate how aging leads to the development of tissue dysfunction and diseases in the elderly. Through the establishment of international research groups and the provision of state-of-the-art laboratories and innovative technologies, we built a science platform allowing us to determine basic molecular and genetic mechanisms underlying the aging process.

We aim to create a knowledge basis for the future development of new therapies designed to improve organ maintenance and health during aging.

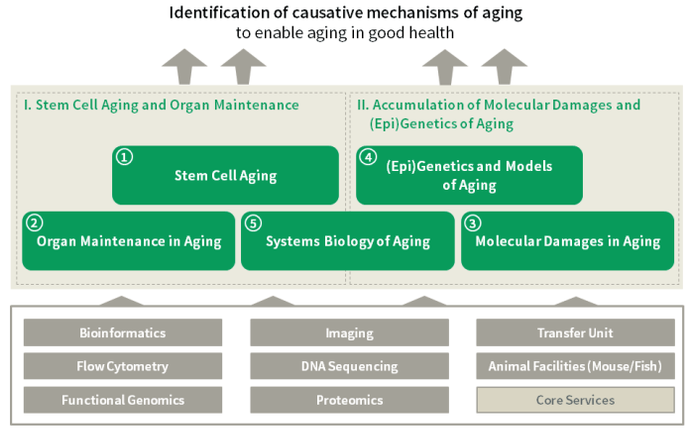
FLI‘s overall aim is to extend the healthy lifespan

Our Focus of Research

To provide a rational basis for the development of therapies aiming to improve health in the elderly, research at the Leibniz Institute on Aging – Fritz Lipmann Institute (FLI) in Jena is focused on two areas:

I. Stem Cell Aging and Organ Maintenance

II. Accumulation of Molecular Damages and (Epi)Genetics of Aging

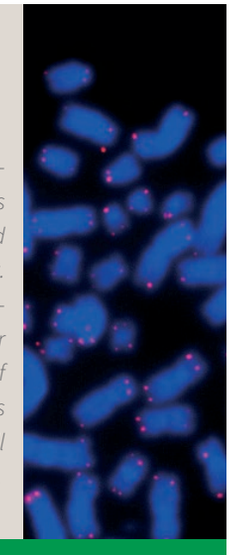


Research foci, project areas and core facilities at the FLI

Our research focus on these two program areas is unique at national and international levels. The main aim of our research is to delineate mechanisms that are relevant for human aging and the development of aging induced dysfunction and diseases. To this end, functional genomic platforms were developed and a variety of model organisms are used spanning from invertebrates to genetic mouse and fish models to humanized models. Translational knowledge transfer in cooperation with international, national and local partners aims at the development of new therapies to preserve tissue maintenance and to reduce the risk of aging-induced diseases thus facilitating healthy and better aging.

Stem Cell Aging and Organ Maintenance (I)

Organ maintenance (homeostasis) and regenerative capacity decrease during aging. This leads to impairments in organ function and to an increased risk of disease development. One reason for this is the reduced performance of adult stem cells which are responsible for the live-long self-renewal and regeneration of organs and tissues. We investigate the causes of this aging-associated inhibition of stem cell function and its effects on organ maintenance.



Accumulation of Molecular Damages & (Epi)Genetics of Aging (II)

A central phenomenon of aging is the accumulation of damages in the cells’ molecular building blocks. This also applies to proteins and the genetic information, DNA. There is growing evidence that the impairment of proteins and DNA contributes to the malfunctions of stem cells and tissue maintenance. But the causes of the aging-associated accumulation of protein and DNA damages are still largely unknown. Additionally, the question rises which genetic factors have an influence on the velocity of aging in molecular components. To address these questions, we are conducting comparative analyses and are making selected changes to genomes and transcriptomes in short- and long-lived model organisms to learn more about the genetic factors influencing the aging process also in humans.