

## 3rd International Symposium Healthy Ageing

20 - 22 February 2017

at the Leibniz-Forschungsinstitut für Molekulare Pharmakologie in Berlin-Buch / Germany

### Focus groups

Working sessions: Thursday, 21 February 2019, 9:00 – 10:30 h

#### 1\_ Immunology and ageing

Room MDC.C 3<sup>rd</sup> Floor, Dendrite III

Head [Prof. Dr. Radbruch \(DRFZ\)](#)

Thematic focus Over the recent years it became clear that ageing of the immune system influences organismal ageing. Researchers from the participating Leibniz institutes teamed up with external partners to delineate molecular mechanisms, genetic factors, and cellular interactions that lead to functional impairments of the immune system in the context of ageing as well as its consequences for organismal ageing. We want to answer if ageing-associated impairments in immune function aggravate damage accumulation and biological ageing.

#### 2\_ Biomarkers of ageing associated dysfunctions and diseases

Room FMP 1<sup>st</sup> Floor, SR A 2.16

Head [Prof. Dr. Helmut E. Meyer \(ISAS\)](#)

Thematic focus The identification of biomarkers e.g. proteins, metabolites and lipids is relevant for the health status of the human metabolic system and age-related diseases, e.g. Alzheimer's disease (AD), the most common cause of dementia in elderly (50–70%). These markers can be used for detecting the early onset of such diseases, as prognostic parameters as well as for monitoring the success of disease treatments. In order to investigate such markers we established a blood biobank (>2000 characterized blood donors) and investigated the composition of Platelet-derived extracellular vesicles (PI-EVs). Using differential centrifugation, nanoparticle tracking analysis, mass spectrometry and Western blot technology we identified PI-EVs subpopulations which contain high amounts of AD relevant molecules: i.e. APP, the AD hallmark protein and ApoE, the most prominent genetic risk factor for AD [1]. This indicates that PI-EVs can shuttle bioactive molecules (ApoE, APP) and nutrients (phospholipids, sphingolipids and cholesterol) between the blood compartment and neural cells. Expansion of microvesicles may negatively affect the structure and/or function of neurons under certain pathological circumstances. The focus of the research group is the molecular investigation of PI-EVs, which will provide the basis for an understanding of their role regarding the

biogenesis of AD and other ageing associated dysfunctions. Therefore, we cooperate with highly qualified partners of the Leibniz Research Alliance, the Leibniz Institute on Ageing - Fritz Lipmann Institute (FLI) and the German Institute of Human Nutrition (DIfE) and also external clinical partners (University of Regensburg and University of Göttingen). This gained knowledge will result in the identification of pre-symptomatic biomarkers which will allow for a therapy (elimination of neurotoxic PI-EVs subpopulation and components) preventing irreversible neuronal damage and in this way a proper treatment of this so far incurable disease.

### **3\_Synaptic Ageing: Implications for the ageing brain**

Room	MDC.C 1 <sup>st</sup> Floor, Axon
Head	<a href="#">Dr. Michael Kreutz (LIN)</a>
Thematic focus	Ageing and cognitive decline are highly correlated in the elderly population even in the absence of neurodegenerative diseases. Despite the high burden for each individual and the society as a whole the molecular, cellular, and behavioral underpinnings of cognitive decline are barely understood. Synaptic dysfunction that involves altered synaptic proteostasis and altered functionality of chemical synapses in the brain are thought to underlie cognitive decline. In our focus group we will address these topics from biochemical, molecular/cellular and systems neuroscience perspectives to eventually break ground for synapse-targeting intervention strategies.

### **4\_Alternative animal models of ageing**

Room	MDC.C 3 <sup>rd</sup> Floor, Dendrite II
Head	<a href="#">Prof. Dr. Thomas B. Hildebrandt (IZW)</a>
Thematic focus	To better understand the principles of ageing, the focus of this group is to elucidate genetic and biochemical factors which determine the ageing process across different species. This involves the use of non-model-species, e.g. ones with extremely short or long life expectancies. The knowledge of different solutions that have evolved in response to similar biochemical challenges - attenuating or enhancing life-expectancy - may be applicable to contribute to an extended health span in human societies in the future.  Planned discussion and coordination of the next joint activities mainly in context with the naked mole-rat research.

## **5\_Determinants of learning and neural plasticity in ageing: From mice to men**

Room	FMP 2 <sup>nd</sup> Floor, SR A 3.16
Head	<a href="#">PD Dr. Stephan Getzmann (IfADo)</a>
Thematic focus	Human aging is associated with deficits in learning and reduced neural plasticity. Yet, the underlying neural mechanisms remain poorly understood. The 'Mice to Men' project is aimed at examining the effects of genetic, environmental, and lifestyle factors as well as training interventions on mechanisms of learning and neural plasticity across the lifespan. We therefore perform comparative analyses of cognitive aging in mice and humans, examining effects of external (e.g. environmental enrichment) and internal (e.g. epigenetic) factors as well as interventions (cognitive and/or physical training) on learning strategies and neural plasticity in aging. In the focusgroup meeting, first results and future reserach directions will be discussed.

## **6\_BIOAGE**

Room	FMP Ground Floor, SR B 1.14
Head	<a href="#">Prof. Dr. Wolfgang Ahrens</a> <a href="#">Dr. Manuela Marron (BIPS)</a>
Thematic focus	The interdisciplinary BIOAGE focus group (five Leibniz Institutes and one Helmholtz Zentrum) will investigate an association network consisting of several modifiable extrinsic and intrinsic determinants of stem cell and immunological ageing. This project will advance our understanding of pathways by deploying innovative methods and assessing novel predictors of biological ageing in a real-life setting within a large population-based sample of the German National Cohort.

## **7\_Health (information) literacy as a contribution to healthy ageing**

Room	MDC.C 3 <sup>rd</sup> Floor, Dendrite I
Head	<a href="#">Martin Merkt (DIE)</a>
Thematic focus	With the increased availability of health information on the internet, adults are faced with the challenge of making sense of health-related information when making health-related decisions. This focus group aims at understanding (a) why and how adults seek health-related information, (b) how competent they are doing so, and (c) how health literacy can be fostered by technology-enhanced interventions.