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## **Rules and organisational structure of the DK AGE\_REG at the University of Innsbruck**

### **Host institution and description**

The DK *ageing and regeneration* (DK AGE\_REG) is hosted by the University of Innsbruck. AGE\_REG provides an integrated training framework for excellent national and international students with a focus on ageing and regeneration research, which are studied in cellular and in vivo models. Faculty members of AGE\_REG aim at providing their students with cutting-edge, competitive thesis projects, excellent working conditions, as well as tailored mentoring and a training program specifically designed for the interests and aspirations of AGE\_REG students.

### **Aims**

Due to a steady increase in life expectancy, the segment of the population aged 60 or over is rapidly increasing worldwide. The number of persons aged 60+ is expected to more than double, from 841 million in 2013 to more than 2 billion in 2050. There is a requirement to quickly develop better prevention and treatments for many of the ailments associated with old age and regeneration deficiency. To cope with these challenges, trained academics and other experts across a wide range of professional occupations will team up in the Doctoral Programme "Lifespan regulation by ageing and regeneration (DK AGE\_REG)" founded in 2013. AGE\_REG was established at the University of Innsbruck within the framework of the research areas plant metabolomics, ageing research and stem cell biology. Its purpose is to provide an excellent environment of educational training for talented PhD students in the field of interdisciplinary cell biology utilizing state-of-the-art omics and cell culture technology. The overall scientific aims of the AGE\_REG DK are i) to unravel molecular mechanisms and networks implicated in ageing in selected model systems ranging from plants, nematodes, cnidarians and ascidians to mice and human cell cultures, and ii) contribute work towards developing new concepts of regenerative strategies to repair and replace damaged cells and/or tissues for future therapeutic use. The main aim for teaching is to supervise and train 14 PhD students in a multi- and interdisciplinary programme of excellence with strong coherence and collaboration between the individual Faculty Members involved. On the one hand the PhD students will earn a PhD degree within the involved fields of cell biology, plant metabolomics, genetics, bioinformatics and zoology. On the other hand they will gain international experience by joining winter and summer schools, conferences, as well as by participating in exchange activities between academia and industry and in particular by spending a period of time abroad as visiting junior researchers.

## **Training Programme**

The central part of the PhD curriculum is the successful completion of a PhD thesis, as well as of a training programme, which includes courses and scientific contributions to international conferences.

### ***Scientific courses***

The PhD students take part in interdisciplinary courses such as lectures, retreats and summer/winter schools. In these courses the PhD students are given the opportunity to present their projects and discuss them with an interdisciplinary audience including external speakers.

### ***Soft skills***

Furthermore, the PhD students are given the opportunity to acquire teaching skills, as well as expertise in scientific ethics, project management and conflict management.

### ***International experience and collaborations with other research institutions and industry***

The PhD students will attend at least two international scientific conferences to present and discuss their research work, thereby initiating future collaborations with other research institutions. The training programme is organized in a flexible manner allowing PhD students to plan research stays abroad based on the network activities of the faculty. The PhD students will have the opportunity to visit a university abroad to work on a project related to their research topic.

The PhD are given the opportunity to work in private industry, as appropriate. In the context of the industrial exchange activities the PhD students work on small, defined projects related to their PhD thesis projects. In this way, the PhD students will establish contacts for a potential future career in industry.

## **Rationale and interdisciplinary approach**

The conceptual framework of the AGE\_REG program is to comprehensively analyse ageing pathways across species at multiple levels in an interdisciplinary manner, with the ultimate aim to understand ageing and develop clinical regenerative strategies in the future. Cellular stress defence and repair/regeneration processes involve antioxidants counteracting reactive oxygen species, such as glutathione, in conjunction with antioxidant enzymes (e.g., superoxide dismutase). Such molecules influence multiple signalling pathways and transcriptional networks, which regulate DNA damage repair mechanisms, protein quality control systems, such as the 20S proteasomal pathway, autophagy, and various forms of programmed cell death. These damage repair systems help delay the accumulation of age-associated damage, thereby allowing an organism to maintain functional integrity and intact energy metabolism. Increased repair processes are also thought to contribute to the robust extension of lifespan by dietary restriction (DR).

Research in model organisms showed that ageing invariably depends upon a combination of genetic and environmental factors. Common denominators of ageing in metazoans are genomic instability, telomere attrition, epigenetic alterations, loss of proteostasis, deregulated nutrient sensing, mitochondrial dysfunction, cellular senescence, stem cell exhaustion, and altered intercellular communication. During recent years ageing research has increasingly resulted in the discovery of gerontological genes in animal models. Interestingly, these genes are conserved across species and involved in basic signalling pathways that regulate energy balance, cellular plasticity, growth, homeostasis, and reproduction. In plants, senescence is induced by various environmental and developmental factors, for example autumnal senescence in the leaves of deciduous trees, and of the vegetative tissues in annual plants at the end of their life cycle. As in animals, mechanisms of cell and

tissue ageing in plants include DNA damage and repair, telomere shortening, genome reprogramming and the removal of damaged cells by programmed cell death.

In conclusion, although significant progress has been achieved during recent years various basic questions remain open: Why do organisms age, how do they age and to what extent are ageing mechanisms conserved or lineage- or species-specific? Which repair processes are known to counteract these processes and may be exploited for regeneration? Are longevity genes identified in model organisms functional in a human physiological setting?

### **Cooperation with other universities**

The DK AGE\_REG commits itself to cooperate with other universities. Excellent scientists working in the field of cell biology from other universities are welcome to join the doctoral programme. Interested applicants are invited to apply for admission to the doctoral programme.

### **Faculty**

The following scientists contribute to AGE\_REG as founding faculty members: Univ.-Prof. Pidder Jansen-Dürr (Forschungsinstitut für Biomedizinische Alternsforschung), Univ.-Prof. Ilse Kranner (Institut für Botanik), Univ.-Prof. Frank Edenhofer (Institut für Molekularbiologie), Univ.-Prof. Bert Hobmayer (Institut für Zoologie), Dr. Ute Rothbacher (Institut für Zoologie), Univ.-Prof. Werner Zwerschke (Forschungsinstitut für Biomedizinische Alternsforschung). Faculty membership is restricted to principal investigators, and their projects are partly funded by the Rectorate within the framework of AGE\_REG. The faculty represents the core of the educational and research activities of the DK AGE\_REG. It consists of high-profile researchers who are experts in cell biology, ageing research and/or stem cell biology.

The faculty reaches a quorum, if at least two thirds of the faculty members are present. The faculty elects the speaker and the deputy speakers by a two-thirds majority. The former fulfils administrative and financial tasks. On a yearly basis she/he reports on the progress of the doctoral programme and the results of internal evaluations. On request of the speaker one of the deputy speakers takes over the day-to-day business. The faculty decides by a two-thirds majority on the admission of new faculty members, the election of the female representative and on the admission of PhD students. Each faculty member acts as main supervisor for at least one PhD student within the programme. The faculty members are supposed to attend faculty meetings and summer/winter schools. The faculty constitutes thesis committees for all PhD students, which are approved by the steering committee.

### ***Admission of new faculty members***

New faculty members are expected to be highly qualified scientists who complement the scientific programme of the DK AGE\_REG. For this they submit an informal application. The admission to join the DK AGE\_REG is decided by the faculty by a two-thirds majority. The General Assembly (GA), which comprises all PIs and all PhD students, is informed about this decision.

### ***Exclusion of faculty members***

A faculty member can resign by own request. Further reasons for excluding faculty members from the DK AGE\_REG are (1) unethical scientific behaviour (i.e. scientific fraud), (2) serious violation of rules for good scientific practice (3) neglect of duties as PhD supervisor and mentor and (4) being without a PhD student within this DK for more than 12 months. If one of the above reasons applies, the speaker together with the deputy speakers has to issue a written statement. If no clarification occurs immediately (point 1 and 2) or within 3 months (point 3 and 4), the exclusion of this member is

proposed to the steering committee. The exclusion has to be decided by more than two-thirds of the steering committee members. This decision will be communicated to the GA. The excluded faculty member is obliged to submit all required reports concerning work and expenses within the DK AGE\_REG to the speaker.

If a faculty member resigns or is excluded, the remaining faculty members shall ensure that the PhD student/s of the excluded faculty member is/are supervised by another faculty member, if possible. In case this is not feasible, the PhD student/s will be excluded from the DK.

### ***Rights and Responsibilities of the Faculty Members***

All faculty members commit themselves to the following tasks:

- submit joint project proposals with other FM
- actively contribute to the DK teaching activities by giving lectures, workshops and/or seminars and help organizing winter/summer schools;
- provide technical and scientific support for all DK members;
- make equipment and materials available to all DK members to the best of their ability;
- actively contribute to the scientific progress in AGE\_REG by participating in thesis steering committee meetings; the selection process of students; the organization of seminars and meetings; the evaluation of student progress reports and theses.

### **PhD students**

The DK AGE\_REG will support PhD students of academic excellence and committed to science. They also have to show good communication skills, social competence and high team competence.

### ***Admission of PhD students***

The applicants have to be enrolled and registered at the University of Innsbruck or the cooperating universities. The applicants should be fluent in written and spoken English. In order to increase the share of female applicants and to take into account special personal circumstances the rules of the DK AGE-REG provide sufficient flexibility to allow the successful completion of the programme in cases of maternity leaves, special private situations, military or community services, health or disability reasons.

The application must contain a detailed CV including a short section describing skills and competences of the candidate and his/her motivation for science, a letter of recommendation and a list of publications including oral and poster presentations at conferences. The application must aim at a research project involving collaboration of at least two FM. The application has to be submitted to the supervisor who is a member of the DK AGE\_REG, who will forward the application to the speaker of the DK AGE\_REG. The faculty decides by a two-thirds majority which application will be selected for a hearing. The faculty has a quorum, if at least two thirds of the faculty members are present. After the hearing the admission to the DK will be decided by two-thirds majority.

### ***Exclusion of PhD students***

Reasons for excluding PhD students from the DK AGE\_REG are (1) own request (2) graduation to PhD (3) removal from the register of PhD students and (4) request of the supervisor. If point (4) applies, the supervisor has to issue a written statement. The speaker has to contact the PhD student, the first and the second supervisor. If no clarification occurs within one month, the exclusion of this PhD student is proposed to the steering committee. The exclusion has to be decided by more than two-thirds of the steering committee members. The decision will be communicated to the GA.

## ***Rights and Responsibilities of the PhD Students***

PhD students are obliged to:

- actively participate in the formal training program of AGE\_REG;
- actively participate in the organization of meetings, retreats and seminars;
- actively contribute to dissemination and outreach activities.

## **The Speaker and deputy speakers**

The speaker is a member of the DK faculty. She/he is elected by the faculty for a period of three years and can be dismissed by the faculty assembly by unanimous vote only. For this decision she/he is without vote. The new speaker can only be elected by more than 50% of the faculty members. The speaker is responsible for the administration of the budget in cooperation with the financing department of the university. The speaker is responsible for the distribution of the budget of AGE\_REG in accordance with the contract with the Rectorate. The speaker decides on the distribution of funds provided by universities, local governments, companies, trusts, etc. to support AGE\_REG in accordance with relevant contracts. She/he chairs the meetings of the GA and presides over the final thesis examinations of all students of the DK. The speaker is responsible for the organization of the selection process for students. The speaker can delegate these responsibilities to the deputy speaker(s). Founding speaker of the DK AGE\_REG is Univ.-Prof. Pidder Jansen-Dürr; founding Deputy speakers are Univ.-Prof. Ilse Kranner and Univ.-Prof. Frank Edenhofer.

## **Student board**

All PhD students of the doctoral programme are members of the student board, which meets at least once a year and elects the student speaker and the deputy student speaker. The deputy student speaker takes over the day-to-day business on request of the student speaker. The student board discusses suggestions for possible improvements of the training and research programme and put them forward to the steering committee, if two-thirds of the PhD students present approve this action.

## **General assembly**

The general assembly consists of all FMs and PhD students. It is chaired by the speaker and discusses all issues concerning the educational programme, organisation, budget and PhD student matters. The general assembly has a quorum, if at least half of its members are present. Recommendations are addressed to the steering committee. The general assembly meets at least once a year. A written invitation including the agenda is sent at least 2 weeks before the meeting. The GA nominates faculty members as well as PhD students for the steering committee.

## **Steering committee**

The steering committee is formed by the speaker, the deputy speakers, one additional member of the faculty, the student speaker and the student deputy speaker. The additional member of the faculty is elected by simple majority during the General assembly meeting. A written invitation including the agenda is sent at least 2 weeks before the meeting. The steering committee decides on all matters of the doctoral programme, such as the approval of the thesis committees, supervision and the approval of the research programme, changes in the training programme, implementation of measures resulting from evaluations, the exclusion of PhD students by the request of the faculty, the election of the female representative, the utilization of funds and nomination of members for the scientific advisory board.

Furthermore, the steering committee will take into account the suggestions of the student board for possible improvements concerning the training and research programme. It is entitled to make decisions, if at least two-thirds of its members are present. Any voting requires a simple majority. It takes decisions with a simple majority of the present members. A demission of the speaker as well as changes of the DK AGE\_REG rules require the vote of a two-thirds majority of its members.

### **Thesis committee**

A thesis committee is constituted for each PhD student by the faculty, consisting of the supervisor and up to two additional members (a second supervisor from the faculty and optionally, a third external supervisor) who are experienced scientists. A written invitation including the agenda is sent at least 2 weeks before the next meeting. The thesis committee meets at least once per term and discusses the progress related to the thesis and the PhD student (milestone meetings). A written statement on the work progress is forwarded to the steering committee.

### **Scientific Advisory Board**

The scientific advisory board (SAB) consists of three internationally recognized experts in the field of the focal themes of the doctoral programme. It reflects strong international expertise and gender equality, if possible, both from academia and industry. The experts are nominated by the steering committee. Their names will be listed on the DK AGE\_REG website. The SAB has an advisory function with the aim to assure the scientific and educational quality of the programme.

### **Women's representative**

A female faculty member acts as the women's representative and takes care of the overall gender policy within the programme. The doctoral programme is fully committed to promote women in science and aims at the best possible gender balance at all levels of staff. This is achieved on the basis of an equal opportunity policy at recruitment and at the subsequent career stages without taking precedence over quality and competence criteria. Female scientists with the same qualification and experience as their male colleagues are preferably accepted. The women's representative will be elected by the GA by more than 50% for a period of three years.

### **General commitment**

The established rules of the doctoral programme are compatible with the general rules of the University of Innsbruck and the cooperating universities. Decisions are binding to all parties. Rules of good scientific practice will be followed by the faculty and the PhD students. All decisions regarding study related matters of the various curricula of the doctoral programme will be taken by the governing body responsible for study law within the universities (detailed regulations can be found in § 78 Universitätsgesetz 2002, university act 2002).

### **Gender-related work environment: compatibility of family and career**

Universities in Austria are obliged by law to ensure gender equality. At the universities involved in the doctoral programme, approved measures of gender mainstreaming are implemented, including a gender sensitive employment strategy. Measures are taken to ensure compatibility of family and work. This includes job opportunities for young parents, as well as the availability of adequate childcare facilities. In order to guarantee a gender equal work environment, all gender related matters will be discussed, and agreed upon, with the offices for equal opportunities at the universities, drawing from their knowledge and expertise. To raise awareness of gender mainstreaming and to support female researchers in developing their scientific career, the PhD curriculum offers seminars dealing with gender aspects and career development.

The faculty is committed to promote women in science and will always consider gender aspects. In order to increase the fraction of female applicants, the programme will provide sufficient flexibility to allow successful completion of the programme in cases such as maternity leaves and special private situations, e.g. filial leave.

### **IPR and co-authorship on publications**

At the University of Innsbruck intellectual property is considered an important outcome of a thriving research culture. Therefore, the university encourages and supports the creation of intellectual property by their PhD students. They fairly share the benefits with the originators. The universities are owners of intellectual property created by any of their employees, including PhD students, during the course of their employment or arising from a duty related to their employment. The universities will make every effort to ensure that a PhD student's right to publish is not unduly restricted by any research contract or process of commercialization. Detailed regulations can be found in § 106 Abs. 2 Universitätsgesetz 2002 (university act 2002). Scientists, who made a significant contribution to a research problem, are entitled to co-authorship on publications. If a publication was written by several authors, each individual contribution must be clearly addressed.

### **Confirmation of participation**

After graduating the PhD students are entitled to obtain a certificate of their participation in the DK AGE\_REG including all courses, summer/winter schools, scientific visits abroad and conferences.

### **Evaluation of the DK AGE\_REG**

The DK AGE\_REG will be evaluated by the Rectorate of the University of Innsbruck. On request the speaker or deputy speaker has to send a report to the responsible member of the Rectorate of the University of Innsbruck.

Innsbruck, \_\_\_\_\_ 2016

(Univ.-Prof. Dr. Pidder Jansen-Dürr)  
On behalf of the speaker team