

Junior Experts Exchange Program, 5 to 12 December 2015

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Japan and Germany must face very similar demographic challenges in the coming years. In a global comparison, both countries have one of the highest life expectancies in the world. A child born today in Japan will reach an average age of 84.4 years, in Germany life expectancy currently stands at 81.1 years, and these figures increase with each year. At the same time, Japan and Germany have a low birth rate of 1.27 and 1.34 children per woman. Consequently, both countries have a growing number of older people in their total populations. According to calculations by the United Nations, about a quarter of the Japanese population is currently aged over 65 years, in 2030 it is forecast to be one third. For Germany there is a similar prediction: here the proportion of over-65s in the population will increase in the next 15 years from 20% to about 27%. Overall, these developments mean that both countries need to find solutions to address the decreasing number of people of working age on the one hand, and the increasing demands on health care on the other.

It is thus not surprising that the Junior Experts Exchange Program 2015/2016 was titled "Aging Society". The main focus of the program is "health and technology". The interdisciplinary nature of this topic was reflected in our group and during our travels. Included among the four participants were representatives from biology, pharmacology, sports science and gerontology. During our visit to Japan we learned about university research groups, research institutions as well as companies that deal with the different facets of aging.

Our first stop in Osaka addressed in particular the biology of aging. Experts from the Kansai Center, National Institute of Advanced Industrial Science and Technology (AIST) presented us with their new research findings and methods for determining the biological basis of dementia and cancer. The visit to the Quantitative Biology Center of the Riken Institute was included under the theme of cell research.

During a brief stopover in Nagoya Prefecture,

we visited the National Center for Geriatrics and Gerontology in Aichi, the largest geriatric clinic in Japan. As part of a tour of the facility we were given an overview of the infrastructure for inpatient dementia care, procedures used for the diagnosis and prevention of dementia diseases, and finally the latest technical solutions for the rehabilitation of motor impairments.

The main focus of the following day was technical aids to assist with motor skills. During our visit to the company CYBERDYNE in Tsukuba we were given the opportunity to learn more about their systems. For example, the exoskeleton HAL supports the movement of the lower extremities and is used in the rehabilitation of movement limitations after a stroke. In a subsequent meeting with the Association for Technical Aids and some development engineers from HONDA, Tōkyō, we had the chance to discuss and personally try out how a hip belt works in assisting strength when walking (Walking Assistance Device).

The Tsukuba Center is the largest in Japan and also the headquarters of AIST. It's here where a number of research groups deal with the biological foundations of aging (e.g., animal models for research into Alzheimer's disease). The focus of our visit was to learn more about the technical tools used to assist with care and independence that were developed here. As part of lectures and lab demonstrations, we learned more about a self-navigating wheelchair, an interactive

system for people with severe paralysis and a corresponding testing device at the Robot Safety Center.

The last leg of our journey took us into the disaster-struck Sendai Prefecture. On arrival we were impressed with how quickly the city was rebuilt after the Tsunami hit in March 2011. Our visit to the Institute of Development, Aging and Cancer of Tōhoku University primarily addressed cognitive aging. The Institute conducts basic research in neuropsychology and neurobiology. In addition, they are developing technical aids to delay cognitive degradation processes (e.g., the computer game "Dr Kawashima's Brain Training") and to reduce social isolation.

Although our schedule was jam-packed, we took advantage of every opportunity to learn more about Japanese culture in addition to research projects. This included, for example, a visit to the Buddhist temples and Shinto shrines in Kyōto, the castles in Ōsaka and Nagoya, the wonderfully peaceful parks in Tōkyō, a view from Tōkyō Tower and finally the chance to participate in a tea ceremony.

I would like to close by thanking the government officials from both countries and the staff of JDZB for financing, planning and coordinating the program. In addition, I would like to thank my colleagues from the Japanese research institutions, who warmly welcomed us and provided us with such keen insights into their research, and lastly our tour guide, who always answered our many questions and made any written guide redundant.



Participants in front of Nagoya Castle, from left to right: Dr. Markus BRECHMANN (Bayer Pharma AG), Dr. Julia von MALTZAHN (Leibniz Institute for Aging Research), Dr. Martin GRIMMER (TU Darmstadt), Dr. Bettina WILLIGER