

**Education, Research and Innovation – The Universities' Mission  
between Academic Core Values and Societal Expectations:**

*Innovation and Societal Impact through Research, Teaching and  
Learning: What Do We Mean by it and  
How Do We Achieve it?*

**A viewpoint from the Life Science and  
Natural Science**

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# Kurume University, one of the oldest private medical school in Japan

Located in Fukuoka Prefecture

<u>Faculty</u>	<u>Establishment</u>
School of: Medicine	1928
Commerce	1950
Law	1987
Literature	1992
Economics	1994

## Attached schools

Senior High School	1950
Junior High School	1969

# of Students: 7,883

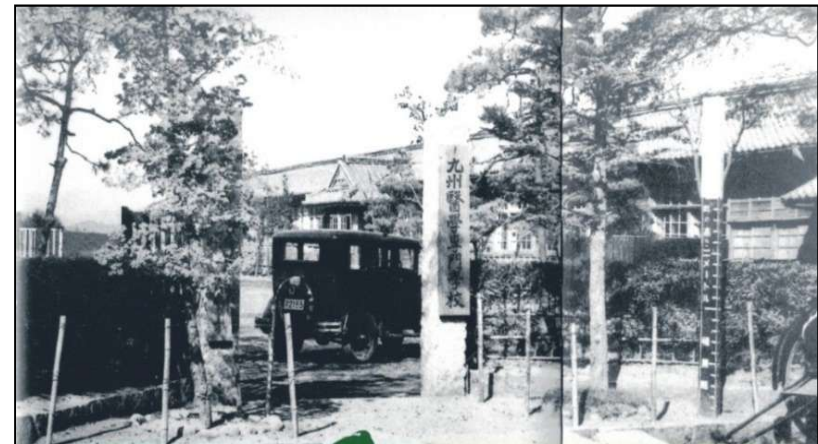
(Univ. : 6,779, High school: 1103)

& 294 Graduate students

= 8,176 Total Students



Original Campus in 1928





# 4 campuses in Kurume Univ.





# Kurume Univ. Hospitals



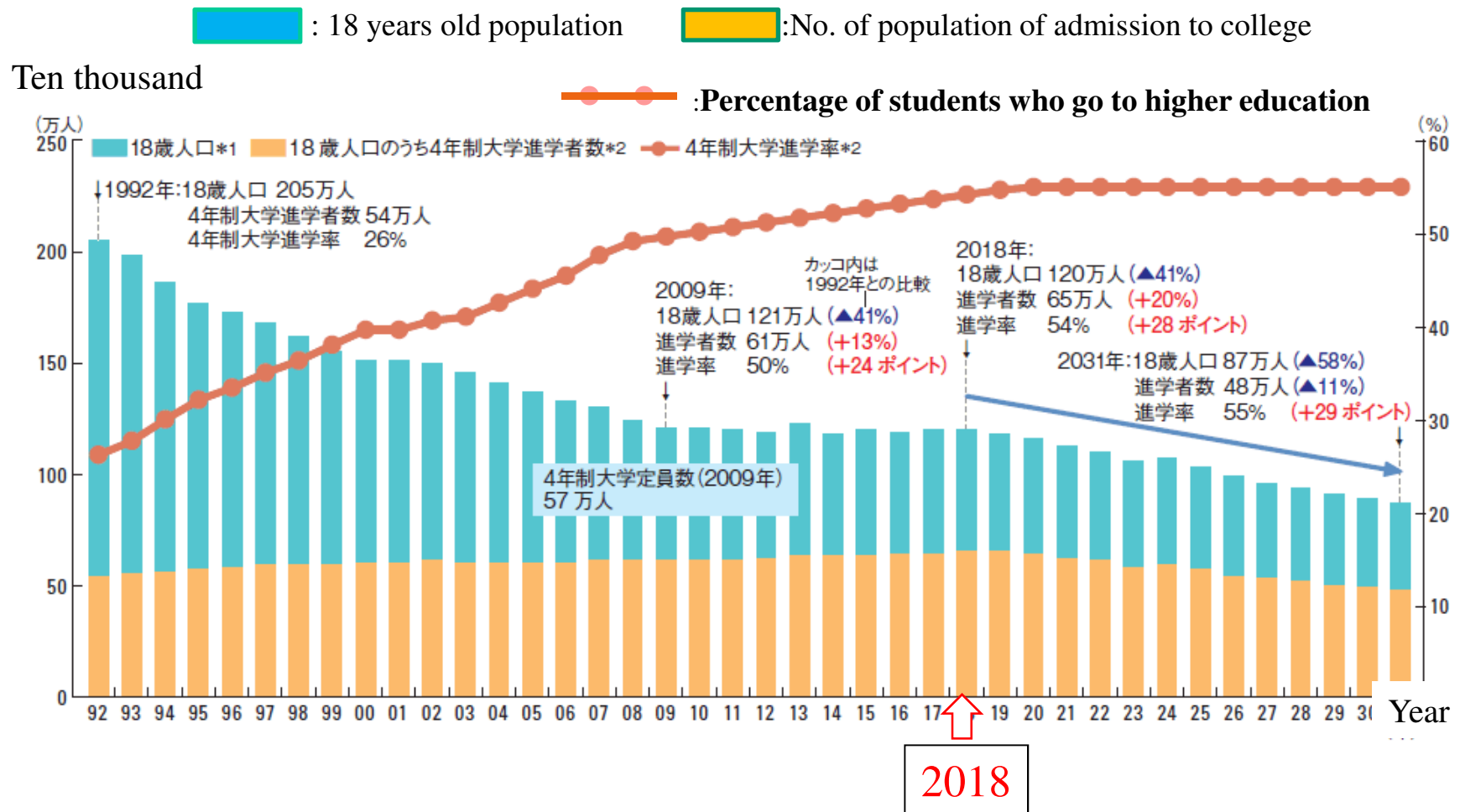
65.6% in total income  
Government subsidy: 5.9%



# **Problematic Issues that University Education is facing in Japan**

1. Aging society
2. Declining regional economy
3. Increasing medical demand for aging welfare
4. Decreasing youth population that causes financial difficulties in medium and small sized regional universities
5. Decrease of governmental financial support to higher education caused by budget deficits

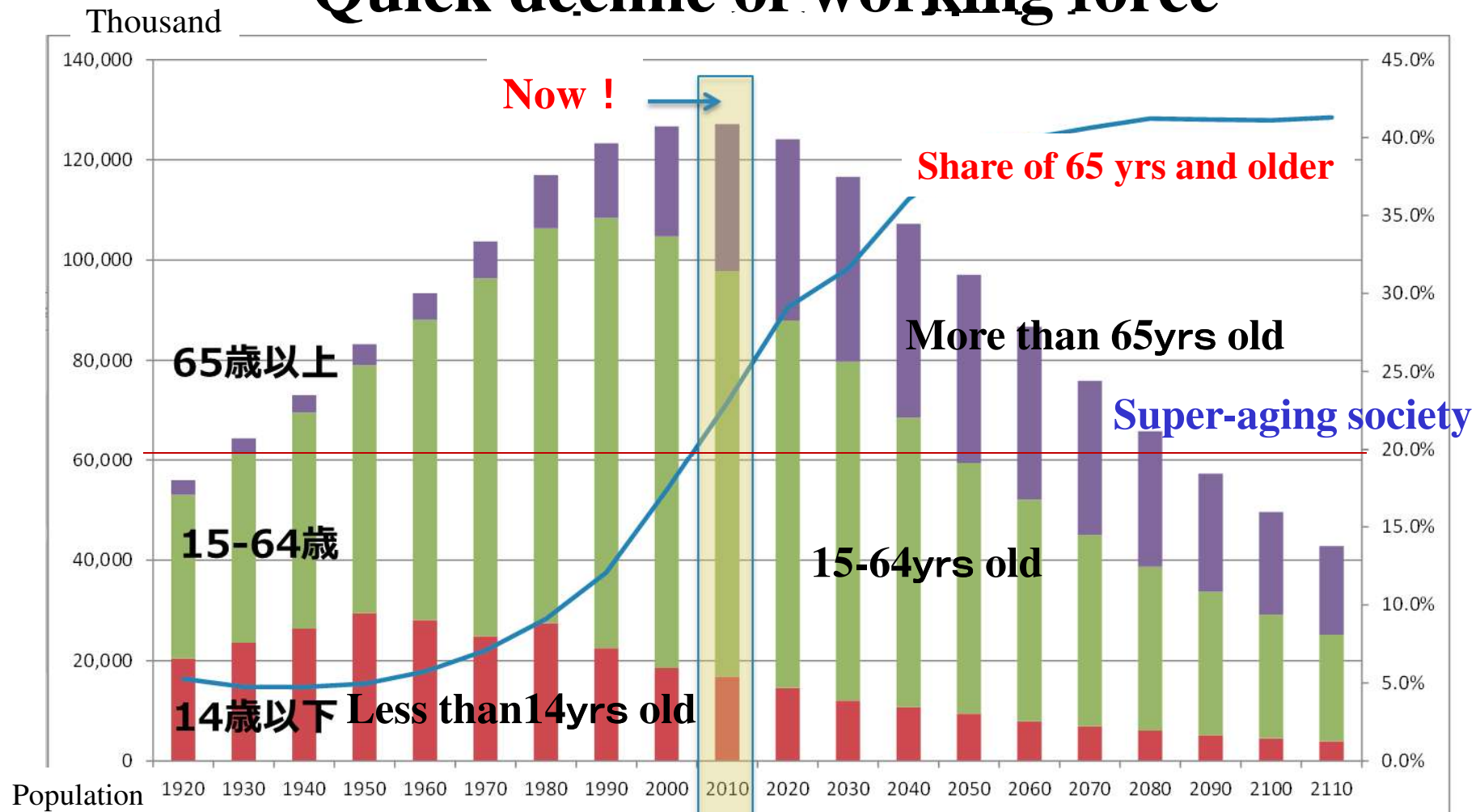
# Trends and prediction of 18 years old population and the college applicants for admission



(Source: Ministry of Education)



# Predicted trends in population until 2110: Quick decline of working force



Source: Prime Minister Office and National Research Institute for Asocial Welfare (2012)

Birthrate (2016) : Japan 1.42, German 1.40, Maintain rate of population: 2.07

# Declining Regional Economy

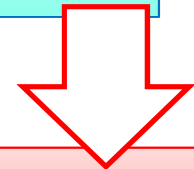
Economy and politics in Japan - Over-concentration to Tokyo



**Declining regional economy and public investment to region**



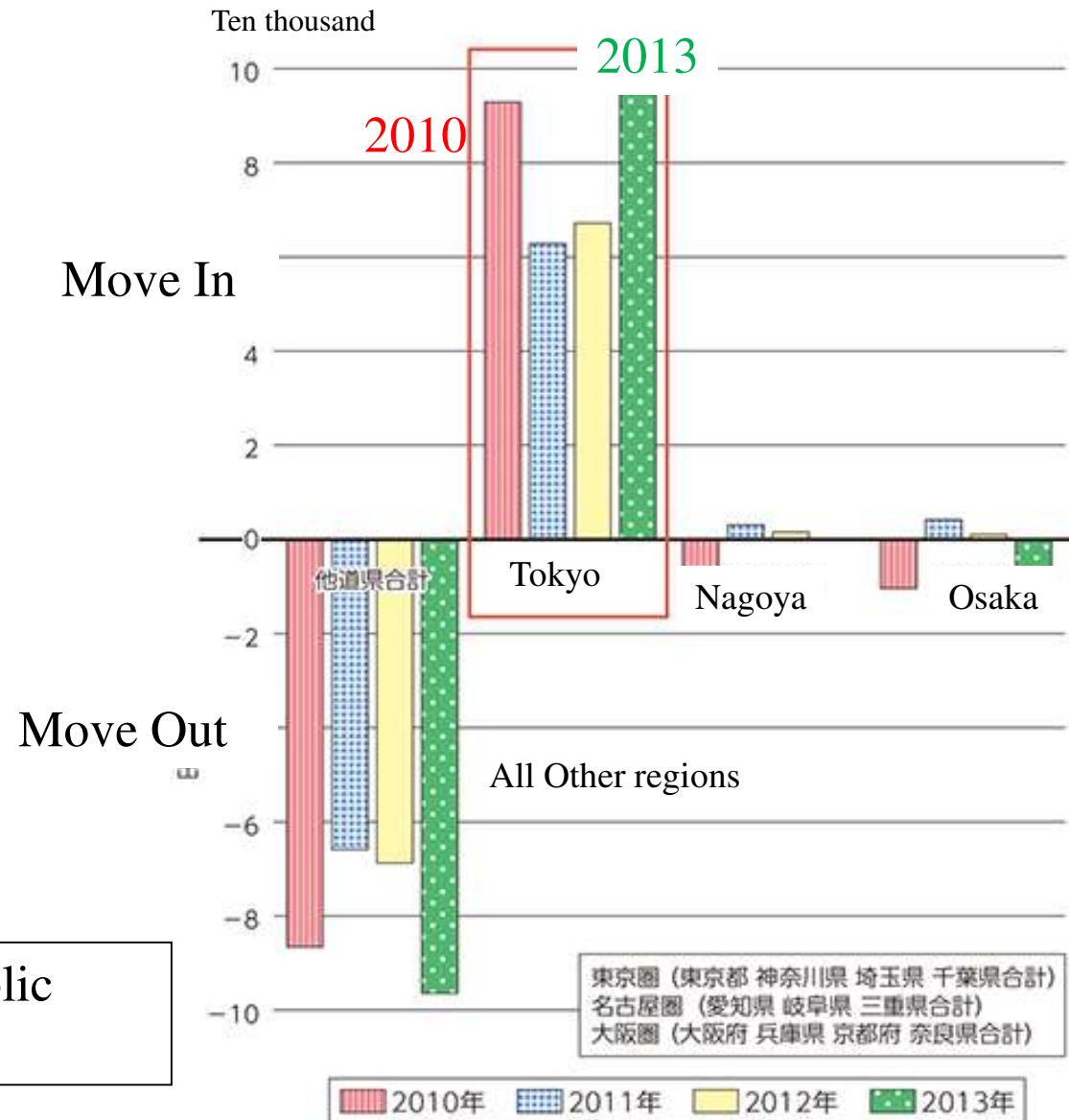
**Long slump of local business and industry →  
Decreasing employment opportunity in region**



**Regional University should become the  
leading forth for regional revitalization**



# Overconcentration of population to Tokyo: Region to Tokyo metropolitan area



Source: Minster of Public  
Management in 2015

# Profiles of Kurume University

- Kurume University consists of:
  - 5 faculties with 11 departments
  - 5 graduate school
  - 14 research centers.

## **Student application for admittance in the last 12 years (2004-2016):**

**Increasing applicants to Kurume University Medical School; about 138 ~ 174%.**

A similar trend is observed in other medical schools;

The number of medical school in Japan; 81 (30: private) each admitting 100 ~120 students yearly.

## **In contrast:**

**Decreasing applicants to the other (non-medical) faculties; 39%-68% (av. 53%).**

**In the non-medical schools of private universities the number of applicants is far lower than the enrolment limit; 46% of 578 Univ., and 64.7% of 320 junior college. (Data in 2014 , Japan)**

## **Innovative Education in the Regional Medical School:**

- Provide talented medical practitioners to the region
- This requires real regional, not central, innovation

### **I . Principal goal of Kurume university → Medical welfare for aging people resulting in longer health span in the region**

- 1) Meet increasing medical demand for the sake of aging welfare
- 2) Provide talented medical practitioners contributing to develop regional economy and culture, resulting in globalization of the region
- 3) Contribution to regional medical service:
  - Higher level of medical service; inducing solutions for aging problems in the areas such as cancer research and regenerative medicine
- 4) Educate human resources talented in the management of regional hospitals and clinics



# Current Topics of Kurume Univ. School of Medicine

## Numbers of Management position of Hospitals (more than 20 beds) and Clinics (less than 19 beds)

(Source: Investigation of the school from which one graduated  
by Teikoku Data bank in 19th.Jun.2014.)

Hospital	No	Clinic	No
1. Kurume Univ.	224	1. Kurume Univ.	711
2. Nihon Univ.	182	2. Nagasaki Univ.	491
3. Nippon Med.	161	3. Tokyo Med. Univ.	477
4. Showa Univ.	133	4. Nihon Univ.	463
4. Tokyo Med.Univ.	133	5. Showa Univ.	448

**Kurume Univ. school of Med. is the leading Univ.  
contributing to regional medical service in Japan.**

## **Toward Innovative Education at Kurume University:**

- Provide talented medical practitioners to the region
- This requires real regional, not central, innovation

### **II . Innovation in education and research**

- 1) Active interaction between the regional industries that deal with medical issues
- 2) Translational clinical research in cancer medicine and regenerative medicine (Establishment of ARO in Dec. 2015)
- 3) Establishment of Faculty of Human Health (Department of Child Studies, Department of Sports Medicine and Science)  
~ April 2017
- 4) Toward the refinement of infrastructure in medical welfare for aging and child care → Maintaining one's health, development of regional employment → Solving social problems

We will establish New Faculty  
from April 2017

## **Our innovative attempts:**

Integrating Liberal arts and Medical science  
Health + Support of child-care = Regional contribution

## **Faculty of Human Health**

**Department of Child Studies**

**Department of Sports Medicine and Science**

Department of Child Studies : 50 students

Department of Sports Medicine and Science : 70 students



## The Average Life Expectancy

Japan has the longest in the world  $\Rightarrow$  Av. 83.7 yrs (F, 86.8; M, 80.5)

However, there is a gap between the life expectancy and healthspan:

Average healthspan, F, 73.6 (12.7 yrs shorter); M, 70.4 (9.1 yrs shorter)

- The medical expenses for the 75 yrs or older (who passed healthspan) are estimated to be about 13 trillion Yen (10.8 billion Euro) per year in 2015; it was 10 trillion yen in 2010.
  - These costs are paid by almost entirely from the public funds in Japan, depriving resources for many other policies, especially those directed toward younger generations, causing conflicts between the medical policy and the social policy.
  - We believe that our scarce resources should be allocated evenly for the childcare and the education for younger generation as well.
- 
- These are the problems we face in Japan now. But, this is also a world-wide problem, too; the average life expectancy in the world is 71.4 yrs in 2016; 5 yrs longer than 10 years ago.

# **Innovation Meeting of Comprehensive Scientific Technology**

(Ministry of Internal Affairs and Communications in Dec. 10<sup>th</sup>. 2015)

## **The 5<sup>th</sup> Basic Plan of the Scientific Technology in Japan (Society 5.0)**

**Realizing “Super Smart Society” should be our ultimate goal as a front-runner in the world social reform.**

**Facts:** Scientific technologies in all areas developed rapidly in the 21 century. Especially, the abrupt development of ICT has promoted the integration of the information, human organization, physical distribution, finance, and many other socio-economic components, resulting in a complex and closely interacting society.

### **Super Smart Society as Our Goal:**

**Necessities and service in healthcare are provided timely and adequately to the people who need them.**

**Any social needs are supported kindly with high quality service.**

**As a result, people can live actively and comfortably despite the differences such as gender, age, race, language and religion.**

# **Innovation in the medical care through life sciences and natural sciences will support “Super Smart Society”**

## **Super Smart Society:**

Necessities and service in healthcare are provided timely and adequately to the people who need them. Any social needs are supported kindly with high quality service. As a result, people can live actively and comfortably despite the differences such as gender, age, race, language and religion.

### **Examples of Innovation:**

**Internet of Thing (IoT):** Navigation surgery (ICT +Robot +AI) →Instrumentation surgery,  
Link up with hospitals using HER (Electric Health Record) of patients,  
Life support business, Sport training using GPS

**Robot:** Robot surgery using Da Vinci, Assist of rehabilitation for motor dysfunction by Robot

**Artificial Intelligence (AI) :** Program into computer for medical care

**Radiotherapy:** Particle therapy (carbon ion radiotherapy), Cyber knife for cancer therapy

**Regenerative Medicine:** Nobel prize of Prof. Yamanaka (Induction of Pluripotent Stem Cells, IPS )

**Intervention therapy:** Catheter therapy for blood circulation disorders

**Dr. Car and Dr. Helicopter:** Improvement of lifesaving rate, Kurume university is the fifth/9 hospital which introduced Dr. helicopter in Japan.



# Challenge to medical education and research

- Shifting emphasis from medical welfare of aged people to all generation
- Medical research goal to improving quality of life
- Integration of medical research and education with ICT (Information and Communication Technology)
- Facing globalization

# **Innovation and Societal Impact through Research, Teaching and Learning: What Do We Mean by it and How Do We Achieve it?**

**A viewpoint from the Life Science and Natural Science**

## **- Summary & Conclusion-**

- **We discussed our experiments in Kurume university.**
- **It is important to understand the concerns of young generation on socio-economical issues in the region.**
- **We have to solve them through innovation in education and research.**

# Our Mission: Regional Revitalization

Kurume Univ. develops with Kurume City.  
Kurume Univ. supports Kurume City progressively.



# Epilogue

Collaboration in education and research between German and Japanese Universities will significantly contribute to sustainable development of the world.

Keep up with the trend of times.

“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.” by/ Charles Darwin

Thank you very much  
for your attention!!



**Kurume Univ. School of Medicine  
Establishment in 1928**