

**Toward the Realization of Medical Care
that Enables People to Live Healthy Even at Age 100
-Moonshot Goal 7 Symposium 2022-**

Moonshot Goal 7 Introduction to the Program

July 16, 2022

Moonshot Program Director

HIRANO Toshio

(President of National Institutes for Quantum and Radiological Science and Technology (QST))

1. Self-introduction
2. Program Structure

(Background) Changes in Diseases Causing Death

Unhealthy Period

Moonshot Goal 7 promoted by AMED

Chronic Inflammation

3. Summary of Moonshot Goal 7



1. Self-introduction

I currently serve as President of National Institutes for Quantum and Radiological Science and Technology (QST). As one of QST's goals, **We aim for a society with Zero cancer deaths, Zero dementia, and Healthy longevity.**

This goal is consistent with the Moonshot goal, **“Realization of Medical Care that Enables People to Live Healthy Even at Age 100”.**

● Field of Specialty

Immunology and life science; PhD.

Discovered Interleukin 6 and opened new ways to treat autoimmune diseases.

Draws on deep and wide-ranging knowledge and experience, from work promoting cutting edge multidisciplinary research to basic medical research to medical applications; served as head of Osaka University and of QST.

● International Prize

- The Sandoz Prize for Immunology (1992)
- The Crafoord Prize (2009)
- The Japan Prize (2011)



Moonshot Program Director

HIRANO Toshio

2. Program Structure

(Background) Changes in Diseases Causing Death

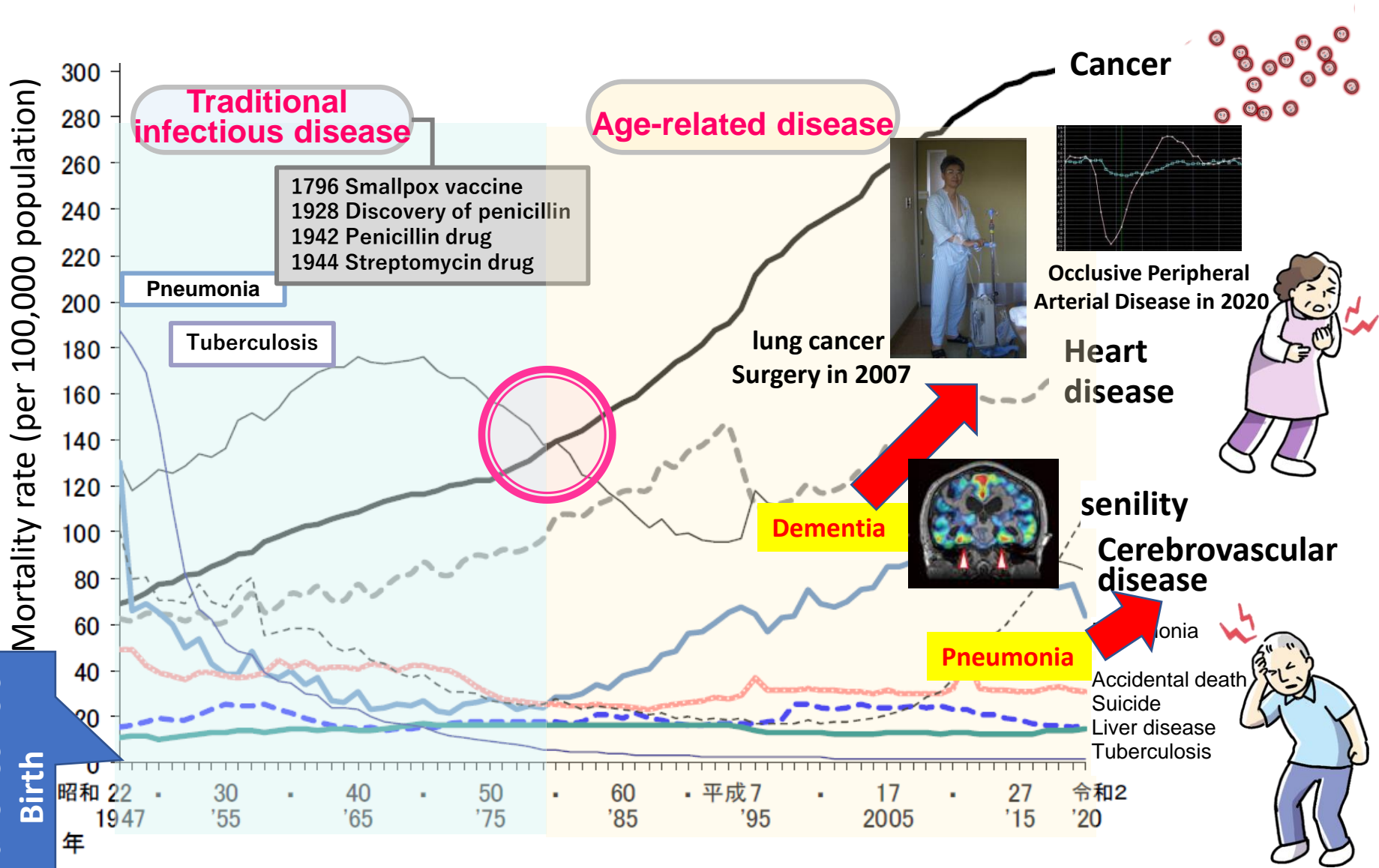
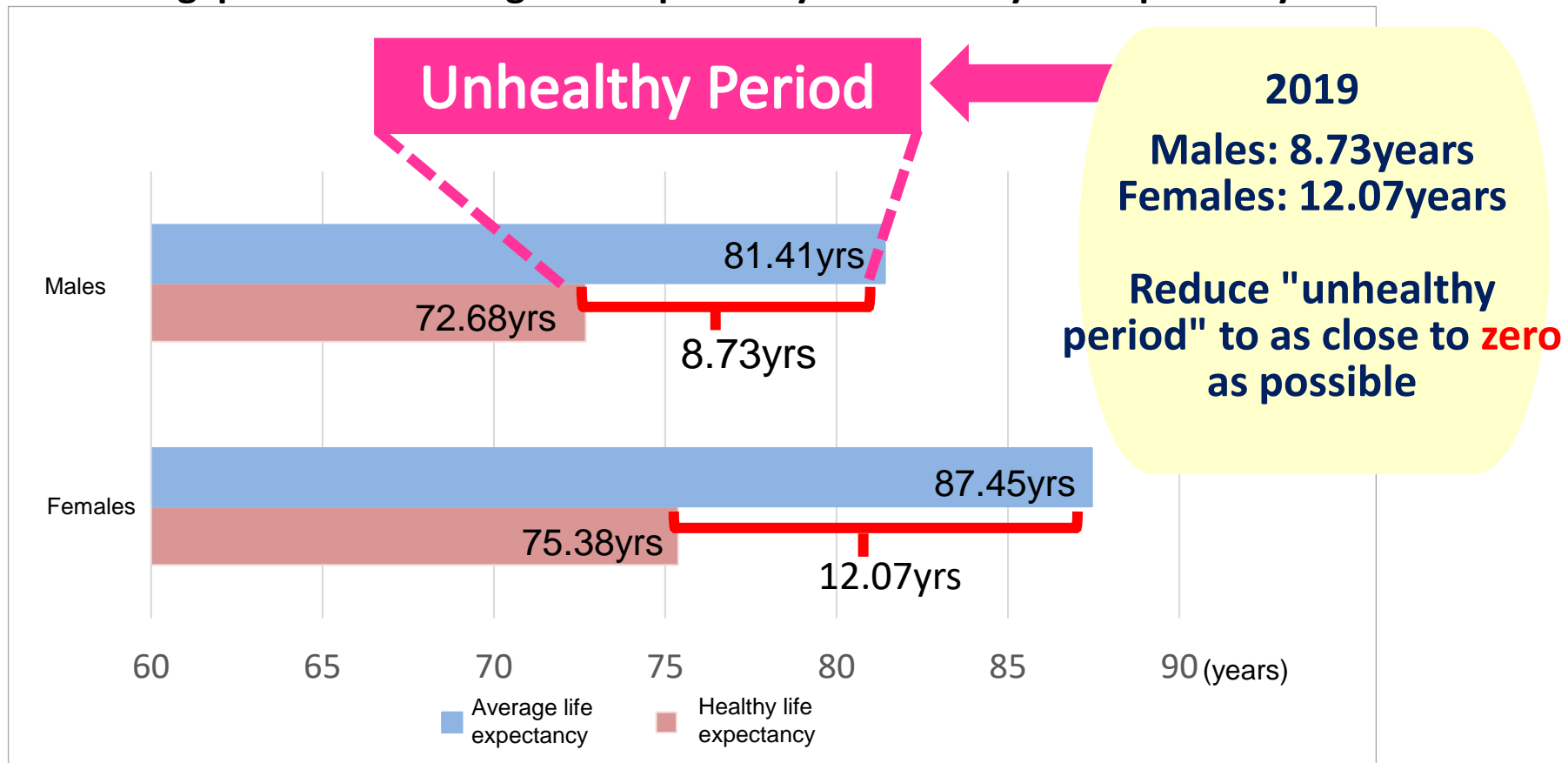


Figure: Annual mortality rates by leading causes of death (per 100,000 population)
 Source: Ministry of Health, Labour and Welfare, "2020 Vital Statistics Monthly Report and Yearly Total (Summary)"

2. Program Structure

Unhealthy Period:

The gap between average life expectancy and healthy life expectancy



Source: Average Life expectancy data from Ministry of Health, Labour and Welfare, "Life Tables 2020". Healthy Life expectancy data calculated by AMED from Report on the collaborative research "Research on the calculation and evaluation of healthy life expectancy and projection of the possibility of extending it", "Comprehensive Evaluation of Health Japan 21 (the second term) and Research for the Next Health Promotion Campaign", "Subsidy for research project to promote health and labor administration 2021(Comprehensive Research Project for Measures against Cardiovascular Diseases, Diabetes and Other Lifestyle Related Diseases)".

Healthy life expectancy refers to the period of time a person survives in good health or a generic term for that indicator.

(State of : **No activity limitations, Subjective health, No need for nursing care, No chronic diseases**, etc.)

2. Program Structure

Moonshot Goal 7 promoted by AMED

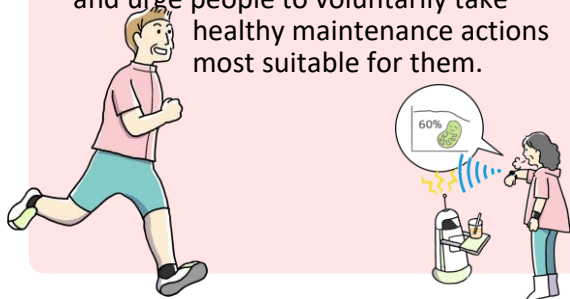
What is “Realization of sustainable care systems to overcome major diseases, for enjoying one’s life with relief and release from health concerns until 100 years old”?

- The average life expectancy of Japanese people has indeed increased, but the important thing is healthy life expectancy. Currently, there is a gap of about 10 years between the average life expectancy and "healthy life expectancy," the period during which a person can live in good health without the need for nursing care or suffering from chronic diseases associated with aging.
- Medical care that cures illness while putting emphasis on "quality of life" and Preventive medicine that prevents unhealthy conditions are becoming important.
- “Release from health concern until 100 years old” means, in other words, making the gap between average life expectancy and healthy life expectancy as close to zero as possible.
- If it realizes in 2040 that you are able to live to be 100 years old in good health, it will enable you to live a second life that is completely different from your first one.

Target 1

Realization of a society where everyone can prevent diseases spontaneously in daily life.

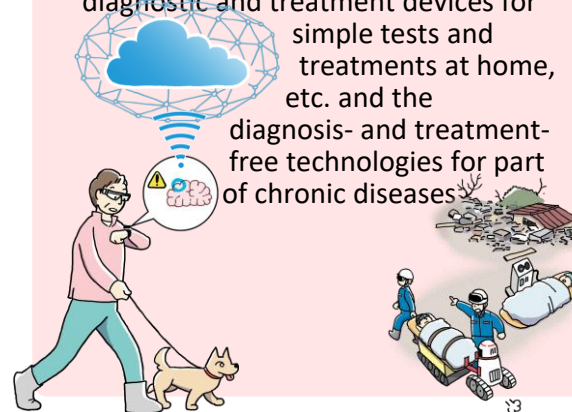
To be able to establish infrastructure to maintain good mental and physical health by developing technologies, in order to stay healthy and prevent the onset and aggravation of diseases by regulation of immune systems or sleep, etc., and to visualize individual physical and mental state in daily life and urge people to voluntarily take healthy maintenance actions most suitable for them.



Target 2

Realization of a medical network accessible for anyone from anywhere in the world.

To be able to receive the same level of medical care as a normal time regardless of region and even upon disasters and emergencies by the diagnostic and treatment devices for simple tests and treatments at home, etc. and the diagnosis- and treatment-free technologies for part of chronic diseases



Target 3

Realization of drastic improvement of QoL without feeling load (realization of an inclusive society without health disparity)

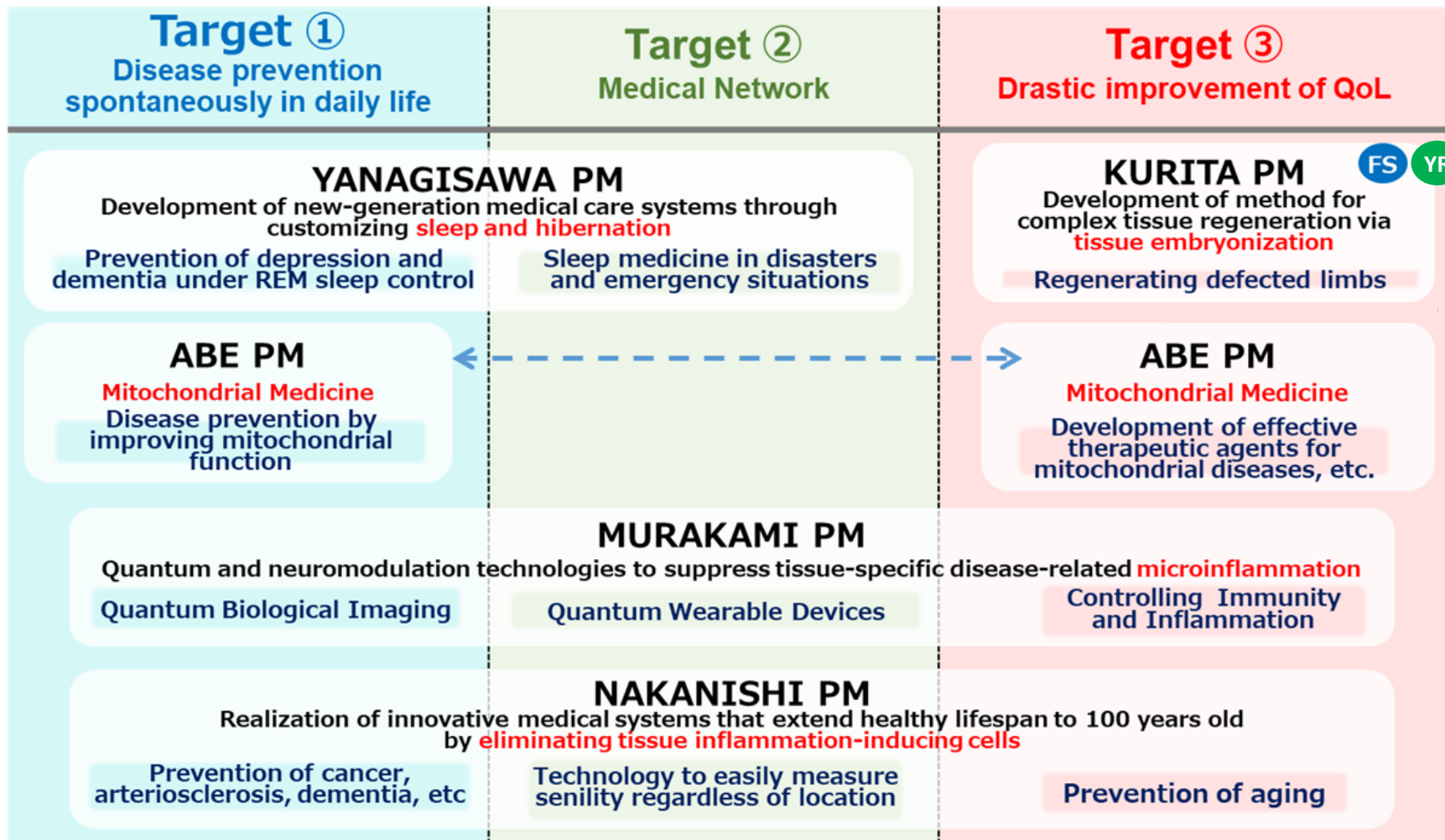
To enable self-reliant life at home without depending on nursing care by developing such technologies as the recovery of body function with rehabilitation without feeling load, normalization of ailing biocontrol systems, regeneration or substitution of weakened organs and so forth.



2. Program Structure

Moonshot Goal #7

Realization of sustainable care systems to overcome major diseases by 2040, for enjoying one's life with relief and release from health concerns until 100 years old: **Achieving A Society with Health and Longevity.**



FS : feasibility study

YR : Young Researcher

2. Program Structure

Chronic inflammation is the basis for age-related diseases

Trigger

Infection Tissue damage Aging Stress Mutation Pre-cancerous cells Smoking
Obesity Neurostimulation / sleep debt, etc. Air pollution etc.

Chronic inflammation

Auto-immune disease

Rheumatoid arthritis
Lupus erythematosus
Thyroiditis
Type 1 diabetes mellitus
Multiple sclerosis
etc.

Inflamm-atory disease

Alzheimer's disease
Type 2 diabetes
Hepatitis
Cardiovascular disease
Arteriosclerosis
Nephritis, etc.

Cancer

Lung cancer
Liver cancer
Stomach cancer
Colon cancer
Pancreatic cancer
Breast cancer
Prostate cancer, etc.

2. Program Structure

Point Control of Chronic Inflammation

Gut flora Immunity Engineering

1. Chronic inflammation is a persistent inflammatory response that deviates from control and is **a major cause of age-related diseases**.
2. If chronic inflammation can be controlled, disease itself can be dramatically reduced and **healthy life expectancy can be extended**.
3. The research and approach will be begun with five projects on sleeping, mitochondria, microinflammation, senescent cells, and reprogramming.

ABE Takaaki

Mitochondrial Medicine

YANAGISAWA Masashi

**Sleep and Hibernation:
Deciphering the Mysteries**

KURITA Masakazu

**Development of method for
complex tissue regeneration
via tissue embryonization**

NAKANISHI Makoto

**Extending healthy lifespan
by elimination of senescent cells**

MURAKAMI Masaaki

**Elimination of Microinflammation
(seed of disease) by Quantum
Technology and Neural Pathways**

**Control of
Chronic Inflammation**
The basis of Achieving A Society
with Health and Longevity

3. Summary of Moonshot Goal 7

- Not decrease the quality of life significantly before and after sickness.
(Aim for **medical treatment with emphasis on the quality of life.**)
- **Control chronic inflammation** which is a key of diseases associated with aging.
- **Enjoy a healthy life during the almost period of our life span.**

We aim for
**the Realization of Medical Care
that Enables People to Live Healthy
Even at Age 100**

