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PERSONAL HISTORY

BIRTH:

1952 in Tokyo, Japan

EDUCATION:

1975	B.A. (Biochemistry) Department of Biochemistry, The University of Tokyo
1977	M.A. (Biochemistry) Department of Biochemistry, The University of Tokyo
1980	Ph.D.(Biochemistry) Department of Biochemistry, The University of Tokyo

CARRIER:

1980-1981	Research worker: Department of Biochemistry, The University of Tokyo
1981-1982	Postdoctoral fellow: Department of Biochemistry, and Molecular and Cell Biology, Northwestern University
1982-1983	Research Associate: Department of Biochemistry, and Molecular and Cell Biology, Northwestern University
1983-1987	Assistant Professor: Department of Biochemistry, Faculty of Pharmaceutical Sciences, Setsunan University
1987-1991	Associate Professor: Department of Biochemistry, Faculty of Pharmaceutical Sciences, Setsunan University
1991-1998	Associate Professor: Department of Radiobiochemistry, School of

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Pharmaceutical Sciences, University of Shizuoka
1998-present Professor and Head: Department of Medical Biochemistry, School of Pharmaceutical Sciences, University of Shizuoka

2005-2007 Dean: Graduate School of Pharmaceutical Sciences, University of Shizuoka.
2007-2011 Dean: School of Pharmaceutical Sciences, University of Shizuoka.
2013-2015 Vice-president: University of Shizuoka.
2015-2017 Dean: Graduate Division of Pharmaceutical Sciences, University of Shizuoka.

MEMBERSHIP:

Pharmaceutical Common Achievement Tests organization (Chairperson of the board);
Japan Accreditation Board for Pharmaceutical Education (Board member);
Council on Pharmaceutical Education (Board member)

Pharmaceutical Society of Japan (President of PSJ);
American Association for Cancer Research;
Controlled Release Society;
The Japan Society of Drug Delivery System (Board member);
The Japanese Biochemical Society;
Japanese Cancer Association;
The Academy of Pharmaceutical Sciences and Technology, Japan;
Shizuoka Drug Delivery System Association (manager);
Science Council of Japan

AWARDS:

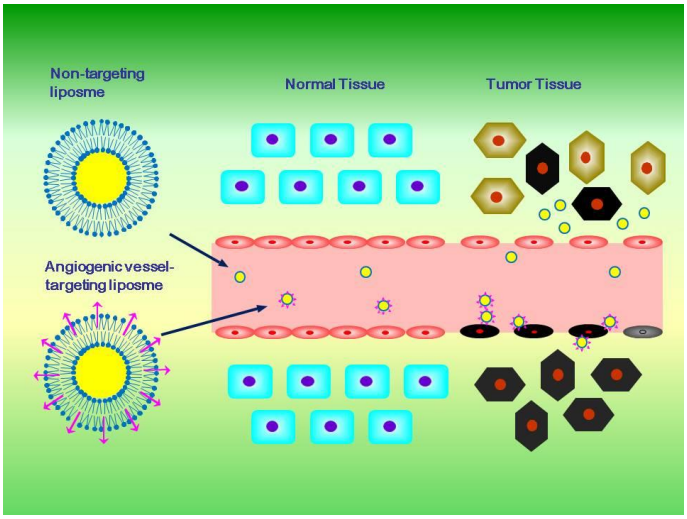
- Pharmaceutical Society of Japan Award for Encouragement of Research (1995)
- Japan Society of Drug Delivery System Nagai Award (2012)
- The APSTJ Takeru & Aya Higuchi Memorial Prize, (The Academy of Pharmaceutical Science and Technology, Japan) (2015)
- Pharmaceutical Society of Japan Award (2016)

RESEARCH

Japan has become a super-aged society. Elderly people often have various diseases. We propose that “health and longevity” does not mean free of disease, but rather maintenance of usual lifestyles with or without appropriate medications. Because cancer, followed by ischemic diseases, is a leading cause of death in aged people, overcoming this disease is important. Severe side effects

that reduce the quality of life (QOL) typically accompany treatment with anticancer drugs. Drug delivery systems (DDS) utilizing nanocarriers not only enhance the therapeutic efficacy but also reduce adverse effects; therefore, therapy that employs DDS should maintain high QOL. Our current research aims at the development of novel DDS medicines focused on cancer and ischemic diseases to support health and longevity.

Angiogenesis is critical to cancer growth. Cancer-associated neovessels are ideal targets for DDS because nanocarriers injected into the bloodstream interact directly with them. We have developed DDS targeted to angiogenic vessels and applied this strategy to nucleic acid medications.



Antineovascular therapy.
Conventional nanocarriers accumulate in the interstitial spaces in tumor tissue and release anticancer drugs that cause tumor cell damage (upper panel). In contrast, anticancer agents encapsulated in neovessel-targeted liposomes damage angiogenic endothelial cells, resulting in eradication of cancer cells through depriving them of oxygen and nutrients.

To develop neovessel-targeted DDS, we first isolated a peptide probe with strong affinity for angiogenic vessels. Liposomes encapsulating anticancer drugs and decorated with the peptide inhibited tumor growth in tumor-bearing animals by damaging angiogenic endothelial cells. In the course of our research, we found that nucleic acid medication interferes with RNA, which suppress expression of specific proteins. Because conventional nanocarriers are not suitable for the delivery of small interfering RNA (siRNA), we developed novel nanocarriers that remain in the circulation for prolonged periods, enabling efficient delivery of siRNA to target cells. We designed novel polycation lipids for preparing polycation liposomes (PCLs) for the efficient delivery of siRNA after systemic injection. We then showed that neovessel-targeted PCLs complexed with certain siRNAs suppressed angiogenesis and cell growth, efficiently suppressing tumor growth in vivo.

Recently, we found that liposomal nanocarriers accumulate in brain ischemic region by use of ischemia/reperfusion rat model. Those liposomes carrying neuro- protective agents efficiently improve the outcome of ischemia/reperfusion injury. We hope that our research results contribute the development of new DDS drugs and “health and longevity”.

RECENT PUBLICATIONS

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