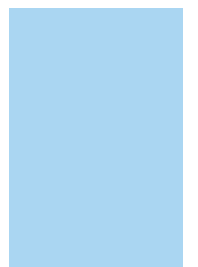


Research Centers





Vice Director
Hideya KAWAJI

Hideya KAWAJI has been the vice director of Center for Genome & Medical Sciences since 2020. He received Ph.D from the Graduate School of Engineering Science, Osaka University in 2003. He started his research in information science, development of a method to explore conserved sequence domain in uncharacterized amino acid sequences. He then moved to RIKEN to study transcriptome and its regulation through transcription starting site (TSS) profiles at base-pair levels, with development of computational and experimental methodologies. After working as researcher, unit leader, coordinator at RIKEN and visiting associate professor at Yokohama City University, he moved to the current position. His current interest is the logic of gene regulation encoded in the human genome sequences, impacting our health and diseases.

Genome & Medical Sciences

<https://www.igakuken.or.jp/genome-center/>

Staff

Director

Hisao MASAI

Senior Researcher

Keisuke OBOKI

Researcher

Naoko YOSHIZAWA

Yuichiro HARA

Saki SAITO

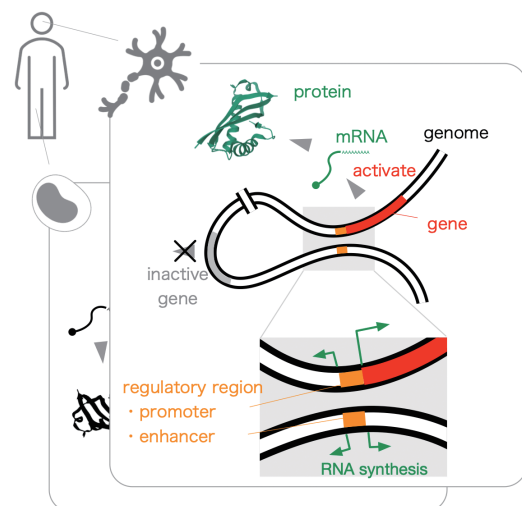
Naoki HIROSE

Research Summary

Our body consists of around thirty-seven trillion cells, each of them carries almost identical genetic information composed of three billion base-pairs. Meanwhile, individual cells express a unique subset of genes, not all, and the expressed ones comprise the molecular basis within (or outside sometimes) the cells. Our genomes carry the structural information specifying both expressed molecules (genes), and the regulatory signals orchestrating molecules to be present in the cells (regulatory elements).

Given that such protein coding sequences occupy only 1 ~ 2% of the genome, identification of functional regions within the remaining 98 ~ 99% is crucial in understanding human biology as well as in interpretation of human diseases. Through a unique RNA profiling technology, called CAGE (Cap Analysis Of Gene Expression), that determines frequency of transcription initiation at the base-pair resolution across the genome, we discovered a series of regulatory regions, called promoters and enhancers, 10-fold or more than the protein coding genes. It indicates presence of still uncovered regulatory regions, and raises a challenge to assess their contribution to the expression of genes. We are going to tackle these challenges by combining high-throughput

genome-wide experiments with large-scale computing. We will also seek the opportunities of collaborations with other research groups in TMIMS to accelerate medical science in individual fields, and with hospitals to understand diseases and to develop new diagnostics and therapeutic tools.



Selected Publications

Hirabayashi S, et al. (2019) 'NET-CAGE characterizes the dynamics and topology of human transcribed cis-regulatory elements.' *Nat Genet.* 51(9):1369-1379.

Yoshida T, et al. (2019) 'Evaluation of off-target effects of gapmer antisense oligonucleotides using human cells.' *Genes Cells.* 24(12):827-835.

Yoshida, E., et al. (2017) 'Promoter-level transcriptome in primary lesions of endometrial cancer identified biomarkers associated with lymph node metastasis.' *Sci Rep.* 7, 14160

Takamochi, K., et al. (2016) 'Novel biomarkers that assist in accurate discrimination of squamous cell carcinoma from adenocarcinoma of the lung.' *BMC Cancer* 16, 760.

Kawaji, H., et al. (2014) 'Comparison of CAGE and RNA-seq transcriptome profiling using clonally amplified and single-molecule next-generation sequencing.' *Genome Res.* 24, 708-717.

Forrest, A.R.R., Kawaji, H., et al. (2014) 'A promoter-level mammalian expression atlas.' *Nature.* 507, 462-70.



Director Unit Leader
Atsushi NISHIDA

Atsushi Nishida has been the leader of the Unit for Mental Health Promotion and the director of the Research Center for Social Science and Medicine since 2020. Previously he worked as a research scientist from 2008 to 2010 at the Tokyo Institute of Psychiatry, and from 2010 to 2014 at the Tokyo Metropolitan Institute of Medical Science. He was a visiting scientist at University College of London MRC Unit in Lifelong Health & Aging from 2012 to 2014, and the project leader for the Mental Health Promotion Project at the Tokyo Metropolitan Institute of Medical Science from 2015 to 2020.

Mental Health Promotion

https://www.igakuken.or.jp/english/r-center_en/rc-social_e/unit-mhp.html

Staff

Researcher Syudo YAMASAKI	Researcher Miharu NAKANISHI
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Research Summary

Mental health is important for one's quality of life (QOL). During adolescence, healthy physical and mental development lays the foundations for a better QOL and is also an integral part of a flourishing society. On the other end of the spectrum, since we live in a hyper-aging society where it is not uncommon for people to live to 100, more and more old people are experience dementia. It is therefore necessary to create a social system that allows people with dementia to live happy healthy lives. The Unit for Mental Health Promotion examines mental health

issues that have a direct impact on the health and livelihoods of Tokyo residents, from childhood mental health issues to dementias affecting the elderly. We use research methods from both social and clinical epidemiology, including cohort studies and randomized controlled trials, to better understand the societal and environmental conditions which will enrich people's mental well-being from birth to old age. In this way, we aim to contribute towards building a society which promotes the mental health needs of the people of Tokyo and elsewhere.



思春期
Teen Cohort is a project that scientifically examines how to support young people as they face the future and grow into adults.

成人期
We are promoting the participation of people with mental illnesses in creating a platform for them to participate in research and service planning.

高齢期
We have developed a care program to support people with dementia, and are verifying the effectiveness of the program and promoting it to all municipalities in Tokyo.

Selected Publications

Nakanishi M, et al. (2020) "Time investment for program implementation to manage neuropsychiatric symptoms: an observational longitudinal study in in-home and residential care settings." *J Alzheimer's Dis*.

Yamasaki S, et al. (2020) "Interaction of adolescent aspirations and self-control on wellbeing in old age: Evidence from a six-decade longitudinal UK birth cohort." *J Positive Psychol*.

Yamasaki S, et al. (2019) "Maternal diabetes in early pregnancy, and psychotic

experiences and depressive symptoms in 10-year-old offspring: A population-based birth cohort study." *Schizophr Res*, 206:52-57.

Ando S, et al. (2019) "Cohort profile: The Tokyo Teen Cohort study (TTC)." *Int J Epidemiol*, 48(5):1414-1414g.

Nishida A et al.(2018) "A randomized controlled trial of comprehensive early intervention care in patients with first-episode psychosis in Japan: 1.5-year outcomes from the J-CAP study." *J Psychiatr Res*, 102:136-141.



Unit Leader
Yuki NAKAYAMA

Career

Yuki Nakayama received her Ph.D. from Tokyo University of Health and Science in 2006 after working as a nurse. She joined the Tokyo Metropolitan Institute of Medical Science in 2007.

She has been a project leader for intractable disease care nursing since 2015.

Her specialty is the nursing research for intractable diseases, and she has carried out research on the support of the social participation of ventilator users and research activities contributing to respiratory management and improvement of QOL.

Intractable Disease Nursing Care

<https://nambyocare.jp/>

https://www.igakuken.or.jp/english/r-center_en/rc-social_e/unit-idnc.html

Staff

Researchers

Michiko HARAGUCHI
Chiharu MATSUDA
Akiko OGURA
Yumi ITAGAKI
Yasuyo KASAHARA

Research Assistants

Saori KAWAMURA
Sachiko KOBAYASHI
Kaoru MORISHITA
Kayoko SHIMIZU
Kazuyo SHIMIZU
Yoshie SANO
Chizu MAEDA

Research Summary

Since the establishment of our laboratory, we have pursued methods for alleviating sufferings related to human dignity such as difficulty in breathing, inability to swallow food, and inability to communicate, as well as support systems for living a safe and secure life for recuperation in familiar areas, targeting ALS (amyotrophic lateral sclerosis) patients who are said to have the most severe medical and disability needs. This unit aims to contribute to the improvement of the quality of life of people living with incurable diseases by presenting a home care support model in Japan, which is facing a super-aging society, while inheriting this tradition.

Our Research Objectives are,

To promote the practical application of new communications support technologies and create a support system that can be used when needed

To improve nursing care that will lead to the dignity and life maintenance of patients with ALS and other severe disabilities

To promote the enhancement of a safe care environment and support system through the promotion of home care safety and health activities for patients with intractable diseases



Selected Publications

Nakayama Y, Shimizu T, Matsuda C, Haraguchi M, et al. (2019) "Body weight variation predicts disease progression after invasive ventilation in amyotrophic lateral sclerosis." *Scientific Reports* volume 9, Article number: 12262

Shimizu T, Nakayama Y, Matsuda C, Haraguchi M, et al. (2019) "Prognostic significance of body weight variation after diagnosis in ALS: a single-centre prospective cohort study." *Journal of Neurology* 266(6), 1412-1420

Matsuda C, Shimizu T, Nakayama Y, Haraguchi M. (2019) "Cough peak flow decline rate predicts survival in patients with amyotrophic lateral sclerosis" *Muscle & Nerve*. 59(2)

168-173.

Shimizu T, Nakayama Y, et al. (2018) "Sensory cortex hyperexcitability predicts short survival in amyotrophic lateral sclerosis." *Neurology* 1,90(18): e1578-e1587.

Nakayama Y, Shimizu T, Matsuda C, et al. (2018) "Non-Motor Manifestations in ALS Patients with Tracheostomy and invasive ventilation." *Muscle and Nerve*. 57(5):735-741.

Nakayama Y, Shimizu T, Matsuda C, et al. (2016) "Predictors of impaired communication in amyotrophic lateral sclerosis patients with tracheostomy invasive ventilation." *Amyotroph Lateral Scler Frontotemporal Degener*. 17(1-2):38-46