

Research outline (Draft)

※An extension number follows our standard phone number (055-981, or +81-55-981).

(Updated: July 1st,2017)

Department	Division	Faculty	Ext.	Research outline
Molecular Genetics	Centrosome Biology	KITAGAWA, Daiju / Professor TAKAO, Daisuke /Assistant Professor YOSHIBA, Satoko /Assistant Ptofessor	5828 5828 5828	We mainly focus on understanding the mechanisms of centrosome duplication by using the combination of innovative and multi-disciplinary approaches. We are utilizing <i>C. elegans</i> embryos and human cell culture as model systems.
	Molecular Cell Engineering	KANEMAKI, Masato / Professor NATSUME, Toyoaki / Assistant Professor	5830 5866	To understand DNA transactions in human cells, we generate conditional cells using the auxin-inducible degron technology for genetic and cytological analyses. We also develop new technologies for construction of mutant human cells.
Cell Genetics	Microbial Genetics	ARAKI, Hiroyuki / Professor HIZUME, Kohji / Assistant Professor	6754 6757	Genetic and biochemical approach to elucidate molecular mechanism and regulation of eukaryotic DNA replication and checkpoint control using budding yeast
	Symbiosis and Cell Evolution	MIYAGISHIMA, Shin-ya / Professor FUJIWARA, Takayuki / Assistant Professor	9411 9414	In order to understand endosymbiotic evolution of eukaryotes, we are studying coordinating mechanisms of eukaryotic cell and organelle/endosymbiont proliferation using algae, plants, and protists.
Developmental Genetics	Neurogenetics	IWASATO, Takuji / Professor MIZUNO, Hidenobu / Assistant Professor	6773 6777	We are studying molecular and cellular mechanisms of neuronal circuit development in the mammals, using mouse genetics and other related methods.
	Molecular and Developmental Biology	KAWAKAMI, Koichi / Professor ASAKAWA, Kazuhide / Assistant Professor MUTO, Akira / Assistant Professor	6740 6739 6739	Genetic studies on development, morphogenesis and behaviors by using a model vertebrate zebrafish.
Population Genetics	Population Genetics	SAITOU, Naruya / Professor JINAM, Timothy / Assistant Professor	6790 6787	We study evolution of genes and genomes, in particular human evolution. We also develop methods for study of genome evolution.
	Evolutionary Genetics	AKASHI, Hiroshi / Professor MATSUMOTO, Tomotaka / Assistant Professor	6793 5820	Mechanisms of genome evolution. Especially weak selection and biosynthetic constraints.
	Ecological Genetics	KITANO, Jun / Professor ISHIKAWA, Asano / Assistant Professor	9415 9416	We use threespine stickleback fishes to investigate the genetic and molecular mechanisms underlying adaptation and speciation.

Integrated Genetics	Human Genetics	INOUE, Ituro / Professor NAKAOKA, Hirofumi / Assistant Professor	6795 6796	Medical genomic study using high-throughput sequencing data is a promising procedure to create an innovate healthcare system and open a new aspect of population genetics.
	Agricultural Genetics	KAKUTANI, Tetsuji / Professor TARUTANI, Yoshiaki / Assistant Professor INAGAKI, Soichi / Assistant Professor	6801 6807 6807	Control and function of epigenetic gene modifications in Arabidopsis.
	Brain Function	HIRATA, Tatsumi / Professor KAWASAKI, Takahiko / Assistant Professor YAN, Zhu / Assistant Professor	6721 6721 6721	Development of the vertebrate nervous system with special focus on neuronal network formation.
Center for Frontier Research	Cell Dynamics and Organization	ODA, Yoshihisa / Associate Professor	6800	To understand the mechanism underlying plant cell wall patterning, we study the dynamic behavior of cortical cytoskeletons and small GTPases in xylem cells.
	Quantitative Mechanobiology	SHIMAMOTO, Yuta / Associate Professor	6784	Our laboratory studies mechanisms of force-based regulation in the mitotic spindle and the cell nucleus. Using our expertise of controlled mechanical manipulation and high-resolution fluorescence imaging, the micro-mechanics of these intracellular structures, assembled in Xenopus egg extracts, are quantitatively analyzed.
	Chromosome Biochemistry	MURAYAMA, Yasuto / Associate Professor	6810	We investigate molecular mechanism underling regulation of chromosome organization and dynamics by recapitulating their biochemical reactions using purified proteins. We now especially focus on SMC complexes.
Genetic Strains Research Center	Mammalian Genetics	SHIROISHI, Toshihiko / Professor TAKADA, Toyoyuki / Assistant Professor AMANO, Takanori / Assistant Professor	6818 6820 6816	In order to understand genetic regulation of complex traits, such as morphogenesis and energy metabolism, we are conducting genetic analyses using mouse spontaneous mutants (variants) and genetically modified mutants.

	Mammalian Development	SAGA, Yumiko / Professor KATO, Yuzuru / Assistant Professor AJIMA, Rieko / Assistant Professor	6829 6832 6832	We study the early developmental events and the regulatory mechanisms during mouse embryogenesis through generation and analyses of gene-knockout and transgenic mice. We are especially interested in the organs derived from mesoderm (heart, lung, somite), and the germ cell system.
	Mouse Genomics Resource	KOIDE, Tsuyoshi / Associate Professor	5843	For understanding genetic basis of behavioral diversity, behavioral and genetic analyses are applied on a variety of mouse resources including wild-derived strains. We are developing genome editing methods in mice for analyzing function of genes.
	Model Fish Genomics Resource	SAKAI, Noriyoshi / Associate Professor KAWASAKI, Toshihiro / Assistant Professor	5848 5849	We establish reliable protocols for genetically modification of zebrafish using sperm, and analyze the molecular mechanisms of spermatogenesis and early development in zebrafish.
	Plant Genetics	SATO, Yutaka, / Professor TAKAHASHI, Misuzu / Assistant Professor SUZUKI, Toshiya / Assistant Professor	6808 6802 6803	The goal of our research is to understand molecular mechanisms governing early processes of plant development using a series of rice embryogenesis defective mutants. Currently we are focusing on the mechanism of regulating the cell division pattern and plasticity in cellular differentiation in rice embryo.
	Microbial Genetics	NIKI, Hironori / Professor AOKI, Keita /Assistant Professor	6870 6827	We investigate higher order structure of chromosomes and their dynamics in yeast and bacteria through genetic and cell biological analysis.
	Invertebrate Genetics	SAITO, Kuniaki / Professor KONDO, Shu / Assistant Professor	6823 6824	We investigate molecular mechanisms of Drosophila gene expression and repression through biochemical and genetic techniques. Especially, we are focusing on the small RNA pathways and chromatin regulation during germ cell development.
	Genetic Informatics	KAWAMOTO, Shoko /Associate Professor	6885	We are working on research and development of databases and information retrieval system for the national bio-resource project(NBRP).
	Genome Biology	ANDACHI, Yoshiki / Assistant Professor	6860	We are performing a systematic analysis of expression and function of the genome of the nematode C.elegans, aiming at understanding of the gene network for development.

Structural Biology Center	Biological Macromolecules	MAESHIMA, Kazuhiro / Professor IDE, Satoru / Assistant Professor HIBINO, Kayo / Assistant Professor	6864 6878 6878	Our research interest lies in determining how a long string of genomic DNA is three-dimensionally organized in mitotic chromosomes and the nucleus, and how the organized genome functions during cellular proliferation, differentiation, and development. We are using a novel combination of molecular cell biology and biophysics to elucidate 3D-organization and dynamics of human genome chromatin.
	Cell Architecture	KIMURA, Akatsuki / Professor KIMURA, Kenji / Assistant Professor	5854 5854	To understand the three-dimensional architecture of the cell and its dynamics, quantitative imaging and modeling approaches are employed. Specific targets of the research are size and shape of organelles, the mechanics of cytokinesis, and cytoplasmic streaming in the <i>C. elegans</i> embryo.
	Multicellular Organization	SAWA, Hitoshi / Professor	6845	We are studying the mechanisms that produce a variety of cell types through asymmetric cell divisions using the nematode <i>C.elegans</i> .
	Gene Network	SUZUKI, Emiko / Associate Professor TAMORI, Yoichiro / Assistant Professor	6812 6813	Combinations of molecular genetics of <i>Drosophila</i> and high-resolution light and electron microscopy are employed to study functional implication of structural and molecular organization of cells, currently focusing on nervous tissue, imaginal discs and follicle epithelia.
Center for Information Biology	DNA Data Analysis	IKEO, Kazuho / Associate Professor	6851	Evolutionary study of genomic structure and gene expression pattern of animals to elucidate the evolutionary mechanism of central nervous system and sensory organs. Evolutionary genomics analysis of various species such as <i>Drosophila</i> and viruses. Aquatic metagenome analysis. Developing databases and computer software for biological research.
	Biological Networks	ARITA, Masanori / Professor KAWASHIMA, Takeshi / Assistant Professor	9449 9449	Network analysis of metabolic pathways based on comprehensive identification and quantification of metabolites (metabolomics); Bioinformatics related to plant secondary metabolism and lipid metabolism
	Genome Informatics	NAKAMURA, Yasukazu / Professor KAMINUMA, Eli / Assistant Professor	6859 6859	Intelligent information technology for structural and functional annotations of large-scale nucleotide sequences.

	Research and Development of Biological Databases	TAKAGI, Toshihisa / Professor	5821	We are researching to apply distributed database technology and/or parallel-distributed computing technology to huge life science databases including DDBJ. Studies on analyzing biological data with using supercomputer.
	Gene- Expression Analysis	OKUBO, Kousaku / Professor HARA, Kazuo / Assistant Professor	5838 5836	“How can we make use of data and information at our finger-tip in making smarter decisions in our own contexts?” Without solving this question, all analytical and descriptive efforts that digitalize the reality end up in vain. Our tentative answer/goal for this is to develop method to enhance “fluidity” and “utility”of medical knowledge among humans and machines.
	Comparative Genomics	TOYODA, Atsushi / Project Professor	6788	We have been conducting advanced genomics research on the plasticity of genome structure and functions using most advanced genome technology such as New-Generation Sequencers.
	Genome Evolution	KUROKAWA, Ken / Professor MORI, Hiroshi / Assistant Professor	9437 9438	We are interested in understanding about microbial genome evolution and microbial community dynamics, and we are currently reaching out in the following two major research directions; I. Facilitate the development of an integrated database “MicrobeDB.jp”, II. Microbial community dynamics.
Experimental Farm		NONOMURA, Ken-ichi / Associate Professor TSUDA, Katsutoshi / Assistant Professor	6872 6874	We aim to elucidate the regulatory system of plant germ-cell development and chromosome kinetics, mainly using seed-sterile rice mutants.
Center for Advanced Genomics		FUJIYAMA, Asao / Project Professor NOGUCHI, Hideki / Project Professor	6788 9459	Development of new algorithms for <i>de novo</i> sequence assemblies, and analytical tools for comparative genomics employing massive data produced from next generation sequencers.