Appendix

# Research outline

(Updated: September 1st,2016)

| Department | Division | Faculty | Ext. | Research outline |
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| Molecular Gentics | Centrosome Biology | **KITAGAWA, Daiju** / Professor<br>**TAKAO, Daisuke**/Assistant Professor | 5828<br>5828 | We mainly focus on understanding the mechanisms of centrosome duplication by using the combination of innovative and multi-disciplinary approaches. We are utilizing *C. elegans* embryos and human cell culture as model systems. |
| | Molecular Cell Engineering | **KANEMAKI, Masato** / Professor<br>**NATSUME, Toyoaki** / Assistant Professor | 5830<br>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<br>**TANAKA, Seiji** / Assistant Professor<br>**HIZUME Kohji** / Assistant Professor | 6754<br>6758<br>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<br>**FUJIWARA, Takayuki /** Assistant Professor | 9411<br>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<br>**MIZUNO, Hidenobu** / Assistant Professor | 6773<br>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<br>**ASAKAWA, Kazuhide** / Assistant Professor<br>**MUTO, Akira** / Assistant Professor | 6740<br>6739<br>6739 | Genetic studies on development, morphogenesis and behaviors by using a model vertebrate zebrafish. |
| Population Genetics | Population Genetics | **SAITOU, Naruya** / Professor<br>**JINAM, Timothy** / Assistant Professor | 6790<br>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<br>**MATSUMOTO, Tomotaka** / Assistant Professor | 6793<br>5820 | Mechanisms of genome evolution. Especially weak selection and biosynthetic constraints. |
| | Ecological Genetics | **KITANO, Jun** / Professor<br>**ISHIKAWA, Asano** / Assistant Professor | 9415<br>9416 | We use threespine stickleback fishes to investigate the genetic and molecular mechanisms underlying adaptation and speciation. |

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| **Integrated Genetics** | **Human Genetics** | **INOUE, Ituro** /Professor<br>**NAKAOKA, Hirofumi** / Assistant Professor | 6795<br>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<br>**TARUTANI, Yoshiaki** / Assistant Professor<br>**INAGAKI, Soichi** / Assistant Professor | 6801<br>6807<br>6807 | Control and function of epigenetic gene modifications in Arabidopsis. |
| | **Brain Function** | **HIRATA, Tatsumi** / Professor<br>**KAWASAKI, Takahiko** / Assistant Professor<br>**YAN, Zhu** / Assistant Professor | 6721<br>6721<br>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. |
| **Genetic Strains Research Center** | **Mammalian Genetics** | **SHIROISHI, Toshihiko** / Professor<br>**TAKADA, Toyoyuki** / Assistant Professor<br>**AMANO,Takanori** / Assistant Professor | 6818<br>6820<br>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<br>**KATO, Yuzuru** / Assistant Professor<br>**AJIMA, Rieko** / Assistant Professor | 6829<br>6832<br>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. |

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| | **Mouse Genomics Resource** | **KOIDE, Tsuyoshi** / Associate Professor<br>**YOSHIMI, Kazuto** / Assistant Professor | 5843<br>5845 | For understanding genetic basis of behavioral diversity, behavioral and genetic analyses are applied on a variety of mouse resources including wild-derived strains. |
| | **Model Fish Genomics Resource** | **SAKAI, Noriyoshi** / Associate Professor<br>**KAWASAKI, Toshihiro** / Assistant Professor | 5848<br>5849 | We establish reliable protocols for genetically modification of zebarafish using sperm, and analyze the molecular mechanisms of spermatogenesis and early development in zebrafish. |
| | **Plant Genetics** | **SATO, Yutaka,** / Professor | 6808 | 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<br>**AOKI, Keita** /Assistant Professor | 6870<br>6827 | We investigate higher order structure of chromosomes and their dynamics in yeast and bacteria through genetic and cell biological analysis. |
| | **Invertebrate Genetics** | **UEDA, Ryu /** Project Professor<br>**KONDO, Syu** / Assistant Professor | 6823<br>6824 | Genome-wide RNAi mutant fly library is established to study genome function in a variety of biological traits of fly development. |
| | **Genetic Informatics** | **YAMAZAKI, Yukiko** /Associate Professor | 6885 | As the information center of the genetic resources, we have been constructing databases and continuously inventing better way to distribute data in order to utilize the resources to its fullest potential. |
| | **Genome Biology** | **KOHARA,Yuji** / Project Professor<br>**ANDACHI, Yoshiki** / Assistant Professor | 6854<br>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<br>**IDE, Satoru /** Assistant Professor<br>**HIBINO, Kayo** / Assistant Professor | 6864<br>6878<br>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. |

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| | **Cell Architecture** | **KIMURA, Akatsuki** / Professor<br>**KIMURA, Kenji** / Assistant Professor | 5854<br>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 *C. elegans* embryo. |
| | **Multicellular Organization** | **SAWA, Hitoshi** / Professor<br>**IHARA, Shinji** / Assistant Professor | 6845<br>6844 | We are studying the mechanisms that produce a variety of cell types through asymmetric cell divisions using the nematode *C.elegans*. |
| | **Gene Network** | **SUZUKI, Emiko** / Associate Professor<br>**TAMORI, Yoichiro /** Assistant Professor | 6812<br>6813 | Combinations of molecular genetics of Drosophila 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 *Drosophila* and viruses. Aquatic metagenome analysis. Developing databases and computer software for biological research. |
| | **Biological Networks** | **ARITA, Masanori** / Professor | 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<br>**KAMINUMA, Eli** / Assistant Professor | 6859<br>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 software technology and/or parallel-distributed computing software technology to huge life science databases including DDBJ. Studies on analyzing biological data with using supercomputer. |
| | **Gene- Expression Analysis** | **OKUBO, Kousaku** / Professor<br>**HARA, Kazuo** / Assistant Professor | 5838<br>5836 | Representation of Bio Medical knowledge.<br>Analysis of gene expression data, and construction of integrated omics databases, database of data analysis methods, construction of theoretical models of gene expression evolution. |

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| | **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<br>**MORI, Hiroshi** / Assistant Professor | 9437<br>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<br>**TSUDA, Katsutoshi** / Assistant Professor | 6872<br>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<br>**NOGUCHI, Hideki** / Associate Professor | 6788<br>9459 | Development of new algorithms for *de novo* sequence assemblies, and analytical tools for comparative genomics employing massive data produced from next generation sequencers. |