

## Department of Molecular Biotechnology

Position	Name	Subjects of Research
Professors	ONO, Kazuhisa	Toward overcoming allergic disorders, we are studying on novel functional substances, which play a crucial role on immune response and arachidonic acid metabolism, and their application to pharmaceuticals.
	KATO, Junichi	Environmental Biotechnology: Development of new biotechnology for bio-remediation, bioprevention, and biomonitoring. Chemical Biotechnology: Development of bioprocess for production of fine and commodity chemicals using solvent tolerant bacteria
	KINASHI, Haruyasu	<i>Streptomyces</i> are interesting bacteria in respect of antibiotic-producing ability, morphological differentiation, and linear chromosome structure. We are studying the structures and functions of <i>Streptomyces</i> linear chromosomes and plasmids, regulation of gene expression, and biosynthesis of polyketide antibiotics.
	KURODA, Akio	Basic studies on cellular functions of inorganic polyphosphate and their applications to environmental and medical biotechnologies. Development of an ultra-sensitive ATP detection method and its application to biosensors. Silicon biotechnology, interdisciplinary study between semiconductor- and bio-technology
	TSUCHIYA, Eiko	We study the structure and function of cellular machinery, especially that of cell nucleus. Now we are focusing on the regulation of chromatin structure and function during the cell growth and differentiation. In addition, we aim to apply our results for developing novel anti-carcinogen.
	※ NISHIO, Naomichi	Research subjects in environmental biotechnology and metabolic engineering fields are: 1) development of hydrogen and/or methane fermentation system of organic solid wastes and animal feces, 2) hydrogen fermentation by engineered bacteria, 3) acetate and/or ethanol fermentation from carbon dioxide.
	HIRATA, Dai	To understand neuronal morphogenesis and behavior plasticity, we study cell-polarity control and olfactory adaptation using the genetically amenable fission yeast and the nematode <i>Caenorhabditis elegans</i> .
	YAMADA, Takashi	Elucidation of molecular mechanisms involved in development, morphogenesis, and environmental responses of plants; especially plant-microbe interactions resulting in symbiosis or pathogenesis. Outcomes of the researches should bring useful technology in breeding, resource-energy production, and biocontrol processes.
	TANAKA, Nobukazu	Studies on elucidation of protein networks involved in the mechanism of organ differentiation on plants and molecular approach to comprehend the strategy for parasitism by plant pathogenic bacteria.
YAMASHITA, Ichiro	We aim to elucidate molecular mechanisms for the regulation of development and differentiation in vertebrates. Specific research projects are on vascular, bone, and body-axis formation and sex determination in medaka fish, and on the cell division and size control in yeast.	
Visiting Professors	GOTO, Kuniyasu	Studies on minute substances in alcoholic beverages and on their analysis methods suited for alcoholic beverages. Search for usefulness food functional components and for decreasing the risk by harmful minute components.
	SHIMOI, Hitoshi	Characterization of sake yeast by molecular biological methods and its application to breeding of strains with new characteristics. Analysis of genes and proteins involved in cell wall synthesis of yeast.
Associate Professors	AKI, Tsunehiro	Basic researches and practical application of lipid-involved physiological reactions in living organisms, and studies on diagnosis and therapy for allergic diseases.
	UENO, Masaru	Study on molecular mechanisms of telomere maintenance and DNA repair and their applications for development of anti-cancer and anti-ageing agents.
	USAMI, Shoji	Analysis and application of signal transduction pathways regulating cell growth of microalgae, development of biological control method for plant pathogens, and search of useful genes by genomic informatics methods

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Associate Professors	KAKIZONO, Toshihide	Development of microbial fuel cell system for high-yield electricity generation from biomass waste. Enhanced carotenoid (astaxanthin) production system by green algae and yeasts through optimization of cultivation conditions, and high throughput screening for higher carotenoid producing mutants.
	KAWAMOTO, Seiji	We are interested in the molecular mechanisms underlying the pathogenesis of allergic disorders. We are also searching for anti-allergic foodstuffs, which are able to prevent atopic eczema or seasonal pollinosis. Another ongoing project is to elucidate immune mechanisms involved in the establishment of liver transplantation tolerance.
	NAKASHIMADA, Yutaka	The subject of research in a field of energy metabolic engineering for production of bio-fuels such as methane, hydrogen and alcohols, and bio-materials from biomass derived stocks based on fermentation technology and genetic engineering of microorganisms
Visiting Associate Professor	IWASHITA, Kazuhiro	The genomics and proteomics study of industrial microorganisms (Koji mold, sake yeast, and lactic acid bacteria) to illustrate the primitive molecular networks characterized strains. The outcome of our researches should be applied to the genomic design for new industrial strains and the investigation of cell factory.
Associate Professors (Special Appointment)	NODA, Kenichi	Research and development of basic technology for high-sensitive and high-speed detection of biological molecule. Development of bio-materials that have high signal intensity using genetic engineering and their application to environmental and medical biotechnologies.
	MURAKAMI, Yuji	Development of novel biosensors combining micro-/nanofabrication technologies and bioscience/biotechnologies. Microfluidics, microTAS and other biochip with enhanced mass transport and with reduced total system size for point-of-care applications.
Assistant Professors	ARAKAWA, Kenji	We aim to characterize the mechanism for the biosynthesis of bioactive compounds and their regulatory system in <i>Streptomyces</i> species. Isolation of new metabolites and characterization of biosynthetic enzymes are also studied in our laboratory.
	KUME, Kazunori	Using the model organisms (yeast and nematode), we study the following subjects: (1) Coordinated regulation of cell polarity and cell cycle in yeast. (2) Olfactory adaptation in nematode.
	TAKIGUCHI, Noboru	To establish the strategies to apply the information processing system in the environmental reaction of the organism to the bioprocess control, we attempt to construct the novel bioprocess control system from the olfactory information processing mechanism.
	HIROTA, Ryuichi	Basic studies on cellular functions of inorganic polyphosphate and their applications to environmental and medical biotechnologies. Development of an ultra-sensitive ATP detection method and its application to biosensors. Environmental microbiology.
	FUJIE, Makoto	The interaction between microorganisms and higher plants. <i>Lotus japonicus</i> is used as a model plant of nitrogen fixation. The control of higher plant meristem is also studied using Arabidopsis as a model plant.
	MIZUNUMA, Masaki	We focus on mechanisms of Ca <sup>2+</sup> -dependent signaling using the unicellular eukaryote, <i>Saccharomyces cerevisiae</i> , as a model system. In particular, we are currently investigating aspects of calcium-dependent signal transduction in yeast, including cell-cycle, life span, and apoptosis.
	YUKAWA, Masashi	Our research interests are the role of chromatin structure in the control of eukaryotic gene transcription. The research projects involve the use of molecular biology, genetics, and biochemistry to characterize the function of proteins involved in the organization of yeast chromatin structure.
	KITAMURA, Kenji	Molecular genetics and cellular biology of an ubiquitin/proteasome-dependent proteolysis in cell proliferation, differentiation, and response to extracellular stimuli using a model organism, fission yeast.

※ Staff who is expected to retire in March 2009