## Graduate School of Pharmaceutical Sciences, Kyushu University
### -Research Organization and Topics-

<table>
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<tr>
<th>Laboratory</th>
<th>Research projects</th>
<th>Staff members</th>
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| Clinical Pharmacokinetics | Pharmacogenomics & Pharmacogenetics  
- Drug metabolizing enzyme gene polymorphisms and their clinical impacts  
- Drug transporter gene polymorphisms and their clinical impacts  
- Mechanisms for an inter-individual variability in CYP3A4 activities  
- Inter-ethnic differences in pharmacokinetics of drugs  
- Mechanisms for gene expression and their clinical impacts  
- Epigenomics  
Pharmacokinetic modelings and their utilities in drug development  
- Population PK/PD/PGx analysis  
- Population PK/PD analysis in special populations (infants, elderly)  
- Population PK/PD modeling and simulation | Professor: Ichiro Ieiri  
Assistant Professor: Takeshi Hirota |
| Pharmaceutics |  
- Chrono-drug delivery system based on molecular biological clock.  
- Development of the strategy for overcoming drug-induced disturbance of biological rhythms.  
- Genetic diagnosis of biological rhythms.  
- Study on molecular mechanism underlying circadian rhythms in the drug susceptibility (receptors and enzymatic activity) and pharmacokinetics (P450-dependent metabolism and drug transport)  
- Mathematical analysis of the pharmacokinetic-pharmacodynamic behavior of medical drugs.  
- Development of drug evaluation system covering the area from drug discovery to appropriate use. | Professor: Shigehiro Ohdo  
Associate Professor: Satoru Koyanagi  
Assistant Professor: Naoya Matsunaga |
| Clinical Pharmacology and Pharmaceutical Care |  
- Establishment of Pharmaceutical Education and Evaluation System  
- Study on Prevention and Treatment of Diseases by Various Drugs, Food and Herbs  
- Study on Circadian Rhythm and Treatment for Circadian Disorder  
- Study on Prevention and Improvement of Drug-induced Side Effects  
- Establishment of Patient Education in Various Cases  
- Establishment of Patient Education and Evaluation System using Psychological Approach for Cancer Patients | Associate Professor: Takao Shimazoe  
Associate Professor: Toshio Kubota  
Assistant Professor: Daisuke Kobayashi |
| Protein Structure, Function and Design |  
- Structure biology  
- Fundamental study on the development for protein medicines  
- Study on protein folding and protein misfolding leading to conformational diseases  
- Improvement of protein function | Professor: Tadashi Ueda  
Associate Professor: Yoshito Abe  
Assistant Professor: Mitsunori Shiroishi |
| Pathophysiology |  
- Ion channels and Receptors  
- Electrophysiology and biochemistry of pathologic conditions in the central nervous system  
- Signal transduction in neuron-glia interaction  
- Drug targets for Alzheimer’s disease and Parkinson’s disease  
- Antioxidants  
- Neuroimmunology and chronic fatigue  
- Brain metastasis of peripheral cancer cells | Associate Professor: Mami Noda |
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| Molecular and System       | • Roles of ATP receptors and glial cells in chronic pain caused by nerve injury (neuropathic pain) and their applications to drug discovery  
  Pharmacology               • Roles of ATP receptors and glial cells in brain homeostasis  
  • Molecular mechanisms underlying chemotaxis and phagocytosis of microglial cells  
  • Mechanisms of the production and release of cytokines and chemokines from microglia and astrocytes  
  • Role of cannabinoids in the nervous system and its application to drug discovery  
  • Discovery of novel pharmacological actions from already-approved drugs (Eco-Pharma)                                                                                     | Professor:  
  Kazuhide Inoue,  
  Associate Professor:  
  Makoto Tsuda  
  Assistant Professor:  
  Hidetoshi  
  Tozaki-Saitoh |
| Molecular Biology          | • Molecular biology of the Escherichia coli genome  
  • Biochemistry and molecular biology of the genomic DNA replication and its regulation  
  • Biochemistry and molecular biology of the bacterial cell cycle and its regulation  
  • Biochemistry and synthetic biology of the regulatory systems for the genomic DNA replication cycle  
  • Basic pharmaceutical molecular biology on the genomic DNA replication and its regulation                                                                                     | Professor:  
  Tsutomu Katayama  
  Assistant Professor:  
  Masayuki Suetsugu |
| Molecular Life Sciences    | • Mechanism underlying the imprinting of defects in the acquirement of gender-specific phenotypes by exposing fetuses to environmental pollutants  
  • Mechanism whereby environmental pollutants reduce nursing behaviors of dams bringing up their infants  
  • Mechanism whereby tumor promoters stimulate cell proliferation  
  • Study on functional interactions between different sorts of drug-metabolizing enzymes: a new concept distinct from genetic polymorphism for inter-individual difference in drug-metabolizing capacity  
  • Study for a change in the function of drug-metabolizing enzymes by alteration of nutritional and physiological conditions  
  • Biotransformation and analytical methods of abused drugs                                                                                                                  | Professor:  
  Hideyuki Yamada  
  Associate Professor:  
  Yuji Ishii  
  Assistant Professor:  
  Tomoki Takeda |
| Bio-analytical Chemistry   | • Creation of new functional molecules through molecular design  
  • Development of molecular probes and their application for elucidation of biological functions  
  • High sensitive analysis of D-amino acids and its biological and clinical applications  
  • Development of sensitive analytical methods for melatonin and related compounds and its clinical applications                                                                 | Professor:  
  Akio Ohjida  
  Associate Professor:  
  Kenji Hamase  
  Assistant Professor:  
  Manabu Nakazono |
| Pharmaceutical Informatics | • Antimicrobial agents-induced renal damage  
  (Cooperative Laboratory)  
  • Anticancer drugs-induced peripheral neuropathy  
  • Cisplatin-induced renal damage  
  • Anticancer drugs-induced vascular injury                                                                                                                                 | Professor:  
  Ryozo Oishi  
  Associate Professor:  
  Nobuaki Egashira |
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| Drug Delivery System (Cooperative Laboratory) | This is a joint cooperative laboratory with the pharmaceutical companies (Astellas, Eisai, Hisamitsu) which have close relevance to the Faculty of Pharmaceutical Sciences.  
  - Development of new drug delivery system (DDS) to increase the drug efficacy, to decrease the side effect of drug and to improve the quality of life.  
  - Research on injectable drug delivery system  
  - Research on oral drug delivery system.  
  - Research on transdermal drug delivery system.  
  - Research on several technologies for drug controlled-release and drug targeting to show the drug's ability to the full and delivery at the target organ of the drug | 1) Professor: Kazuhiro Sako  
  2) Professor: Hiroshi Kikuchi  
  3) Assistant Professor: Takaaki Terahara |
| Kampo-Medicinal Chemistry                      |                                                                                                                                                                                                                     |                                                   |
| Pharmacology and Toxicology                   |  
  - Research in signaling mechanism of cardiac hypertrophy and heart failure  
  - Research in the roles of cysteine modification in regulation of cardiac function  
  - Research in regulation of receptor regulation  
  - Research in ischemic heart disease and apoptosis | Professor: Hitoshi Kurose  
  Associate Professor: Motohiro Nishida  
  Assistant Professor: Michio Nakaya |
| Pharmaceutical Cell Biology                  |  
  - Studies on the biogenesis of intracellular organelles (lysosomes, Golgi complex, and endosomes)  
  - Studies on the mechanisms of biosynthesis and intracellular transport of lysosomal enzymes and membrane proteins  
  - Studies on the mechanisms of biosynthesis and intracellular transport of plasma membrane proteins  
  - Studies on the mechanism of intracellular protein degradation | Professor: Yoshitaka Tanaka  
  Associate Professor: Yukio Nishimura  
  Assistant Professor: Hideaki Fujita |
| Biomolecular Recognition Chemistry *(Green Pharmaceutical Chemistry)* |  
  - Development of Environmentally Benign Synthetic Process  
  - Development of New Catalytic Control Method of Chemoselectivity  
  - Total Synthesis of Biologically Active Compounds Using Catalytic Domino Reaction  
  - Research for Development of New Anticancer Drugs  
  - Development and Application of Molecular Imaging Probes | Professor: Takashi Ohshima  
  Associate Professor: Hiroyuki Morimoto |
| Bio-functional Science                        |  
  - Mechanistic Analysis of Oxidative Stress Diseases  
  - Development and Application of Functional Organic Molecules  
  - Design and Evaluation of Antioxidant | Associate Professor: Kenichi Yamada  
  Assistant Professor: Keiji Yasukawa |
| Bioorganic and Synthetic Chemistry            |  
  - Design of New DNA-Binding Molecules  
  - Design of Intelligent Oligonucleotides with Highly Selective Reactivity and their Application to Regulation of Gene Expression (Functionality-Transfer and Cross-linking Oligonucleotides)  
  - Expansion of Triplex Recognition Codes with W-shaped Nucleoside Analogues (WNA)  
  - Developments of Selective Fluorescence Probes for 8-Oxo-2'-deoxyguanosine in Solution and in DNA | Professor: Shigeki Sasaki,  
  Associate Professor: Yosuke Taniguchi,  
  Assistant Professor: Yukiko Abe, |
| Pharmaceutical Synthetic Chemistry           |  
  - Molecular Design of Nucleosides with Function  
  - Development of Methodology of Asymmetric Synthesis  
  - Utilization of Metal Complexes in Medicinal Chemistry  
  - Design of Non-proteinogenic Amino Acids and Their Utilization in Medicinal Chemistry | Professor: Hiroshi Suemune  
  Associate Professor: Mariko Aso  
  Assistant Professor: Kazuteru Usui |
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| Natural Products Chemistry *(Cellular Biochemistry)* | • Elucidation of cell cycle regulation of DNA replication initiation  
• Elucidation of telomere and centromere chromatin dynamics  
• Mechanism of chromosomal instability and eventual carcinogenesis as a consequence of perturbation of the regulations  
• Application of the basic research to development of novel anti-neoplastic drugs  
• Search for new medicinal seeds from natural resources with the molecular targeted screenings  
• Studies on the chemical ecology in marine life and its application for drug-kinetics  
• Development of the new bio-probes using natural products | Professor: Masatoshi Fujita  
Associate Professor: Tomofumi Miyamoto  
Assistant Professor: Chiaki Tanaka |
| Medicinal Resource Regulation           | • Study on marihuana  
• Study on physiological functions of natural products in plants  
• Molecular breeding of medicinal plants  
• Development of high-sensitive assays for natural products  
• Study on synthetic pathway of natural products | Professor: Satoshi Morimoto  
Associate Professor: Hiroyuki Tanaka  
Assistant Professor: Futoshi Taura |
| Functional Molecular Science            | • Preparation and Magnetic Properties of Photoresponsive Molecular Magnets in Heterospin System  
• Magnetism in Functional Molecular Self-Assemblies  
• Development of Macromolecular MRI Agents  
• Studies on Solid-State Emitting Molecules Responsible to External-Stimuli | Professor: Noboru Koga  
Associate Professor: Satoru Karasawa  
Assistant Professor: Takeyuki Akita |
| Molecular Recognition of Chemotherapy   | This is a collaborative laboratory with the Institute for Clinical Research, National Kyushu Cancer Center in Fukuoka and the Matsunaga Cardiology Hospital in Oita.  
• The Research Institute has faculty members, both clinicians and basic researchers, who are working in different discipline such as pathology, immunology, genetics, biochemistry, molecular biology and statistics. We are focusing on various aspects of cancer (metastasis, resistance to chemotherapy and genetic alteration) and their clinical applications (National Kyushu Cancer Center; Takiguchi).  
• Developing clinical trial designs and interpretation of safety & efficacy data (Matsunaga cardiology hospital; Nakashima) | Professor: Soichi Takiguchi  
Professor: Hajime Nakashima |
| Pharmaceutical Oncology                | • Elucidation of tumor stromal responses that affect invasion and metastasis by cancer cells  
• Elucidation of novel genes that affect angiogenesis and lymphangiogenesis by cancer cells  
• Elucidation of inflammation related genes that promote malignant progression by cancer cells  
• Establishment of molecular basis for personalized therapeutics against molecular targeted and other cytotoxic anticancer drugs | Professor: Mayumi Ono  
Assistant Professor: Yuichi Murakami |

(Cooperative Laboratory)  Department of Pharmacy, Kyushu University Hospital  
(Collaborative Laboratory) 1) Astellas Pharm Inc. 2) Eisai Co., Ltd. 3) Hisamitsu Pharmaceutical Co. Inc.  
(Collaborative Laboratory)  National Kyushu Cancer Center  
Matsumaga Cardiovascular Hospital  

□ The application procedures are outlined in Application Guidelines  
* The name of laboratory marked with asterisk will be changed to that given in parenthesis from April 1, 2012