

**SAITAMA UNIVERSITY**  
**Graduate School of Science and Engineering**

**Saitama University-RIKEN International Joint Graduate School**

**1. General overview**

Saitama University and RIKEN (<http://www.riken.jp/engn/index.html>), one of Japan's leading advanced research institutes began the Saitama University-RIKEN International Joint Graduate School on October 1, 2008. This school offers Saitama University students from overseas the opportunity to enroll in a doctoral program at Saitama University's Graduate School of Science and Engineering, and to pursue their studies under the supervision of faculty with concurrent appointments at RIKEN and Saitama University. RIKEN will provide its research resources covering the fields of physics, chemistry, biology, medicine and engineering, and financial support for a part of the student's living and accommodation costs. Enrollment is once per year in the autumn. The fourth year of this program will begin in October, 2011.

**2. Program**

The Saitama University-RIKEN International Joint Graduate School is a part of RIKEN's Joint Graduate School Program. Graduate students from abroad participating in the Saitama University-RIKEN International Joint Graduate School are supervised by faculty in the six departments of Saitama University's Graduate School of Science and Engineering and the Saitama University Brain Science Institute. The six departments include the Department of Bioscience; the Department of Material Sciences; the Department of Mathematics; Electronics and Informatics; the Department of Human Support and Production Sciences; the Department of Civil and Environmental Engineering; and the Department of Advanced Collaborative Research. The faculty members listed on the table at the end of this program description hold concurrent appointments with RIKEN and Saitama University and have their research laboratory at RIKEN's Wako campus. Successful candidates will pursue their PhD study at RIKEN as Saitama University student and will receive some financial support in the form of a living and accommodation allowance.

**3. Eligibility**

Non-Japanese students who satisfy the qualifications to apply for the PhD courses of the six departments and one institute listed above are eligible to apply.

Applicants must also have the following qualifications:

- A Master's Degree or equivalent research experience
- A high TOEFL or IELTS score (indicative minimum scores are 550 (PBT) and 5.5, respectively)

Note: International applicants whose original language of instruction is not English must take TOEFL.

- Be in good mental and physical health

If admitted, the applicant must be able to come to Saitama University by October 6, 2011.

#### 4. How to Apply

Applicants for this program should first contact by email the faculty member who they would like to have as the supervisor of their studies. Application must be made through one of the faculty listed on the table at the end of this program description.

- Evaluation of applications will be based on the candidate's scholastic ability and research potential assessed from previous credentials, recommendation letters and essays on selected topics. A screening committee will review all applications and the faculty member who has been contacted will inform the applicant of the screening results. Successful applicants must have an internet or telephone interview with one of the six departments and one institute listed above according to a pre-determined time schedule. The details of this interview will be sent out to short-listed candidates. The final selection is based on the performance at the interview and the successful candidate must be accepted as a regular PhD course student at Saitama University. Applicants who fail to meet these criteria will not be accepted.

- Schedule of applications for October 2011 admissions

April 8, 2011	Application deadline
April 11– May 13, 2011	Screening of applicants
June 20, 2011	Notification of results to applicants
October 3-6, 2011	arrival date for international students enrolling in 2011

- Required documents (refer to the following Saitama University's application forms)
  - Completed application form: Form 1 ([pdf:141kb](#))([word:80kb](#))(4 pages)  
(Concise resume and certificates of degrees (BSc & MSc) including official copies of academic records and grades obtained during previous undergraduate and graduate studies as well as list of publications and copies of refereed papers, if any.)
  - Completed application form: Form 2 ([pdf:84kb](#)) ([word:39kb](#))(1 page)
  - Completed application form: Form 3 ([pdf:79kb](#)) ([word:40kb](#))(2 pages or more)  
(Including essays on field of study and study program in Japan)
  - Two letters of recommendation including one from the dean of your Master's course
  - Certificate of English proficiency: Official score of TOEFL, IELTS or equivalent
  - Statement of source of funding  
(The forms are available at the websites of the individual courses listed at the end of this

program description.)

### **5. Financial Support**

The successful applicant will hold the position of International Program Associate (IPA) at RIKEN; RIKEN shall be paid the following for IPA:

1. JPY 5,200 per day for living expenses
2. Accommodation costs: If campus housing is unavailable, up to JPY 70,000 per month (utilities and telephone not included)

Note: If RIKEN campus housing is available, rent is not charged

3. Discounted economy round-trip airfare from home country

### **6. Application, Admission, and Tuition Fees**

Applicants to Saitama University's PhD course are required to pay JPY 30,000 application fee. An additional JPY 282,000 admission fee must be paid upon acceptance. One-half of the annual tuition fee (JPY 535,800) for the PhD course must be paid prior to enrollment.

### **Contacts**

Saitama University Graduate School of Science and Engineering

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RIKEN Global Relations Office

[jpa-info@riken.jp](mailto:jpa-info@riken.jp)

URL : <http://www.riken.jp/engn/r-world/riken/organ/ipa.html>

Graduate School of Science and Engineering departments and faculty with concurrent appointments for Saitama University-RIKEN International Joint Graduate School

(as of January 2011)

Department	Type of Degree	Department Outline
Bioscience	Doctor of Philosophy or Doctor of Science	Chemical biology, recombinant DNA in eukaryotes, molecular cell biology relating to nucleocytoplasmic exchange, the growth and differentiation of insects, the physiology of the cell cycle and posttranslational modification  <a href="http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/life.html">http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/life.html</a>
Faculty	Email	Key words & comments
Yukishige Ito	yukito(at)riken.jp	Carbohydrate Chemistry, Glycobiology, Apply synthetic organic chemistry to clarify functions of glycoconjugates and oligo(poly)saccharides  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/synthetic/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/synthetic/index.html</a>
Hiroyuki Osada	hisyo(at)riken.jp	Chemical Biology, Drug Discovery Our research starts from the discovery of the bioactive compounds that regulate the mammalian cell function. Then, the research will be expanded to the following subjects. 1) Biosynthesis of microbial metabolites. 2) Identification of molecular targets of bioactive compounds. 3) Mining and functional analysis of molecular targets of bioactive compounds.  <a href="http://www.antibiotics.riken.go.jp/english/ess_eng.html">http://www.antibiotics.riken.go.jp/english/ess_eng.html</a>
Naoko Imamoto	nimamoto(at)riken.jp	In eukaryotic cells, most of genomic information is stored in the cell nucleus. The main subject of our laboratory is to understand the nucleocytoplasmic transport and organization of cell nucleus to uncover new aspects and principles on regulation and maintenance of nuclear function. Our current effort has been focused on dissecting the dynamic behavior of nucleocytoplasmic transport machinery, transport pathways, and functional relation between nuclear envelope and chromatin structure in the context of live cells and cell-free reconstituted systems. We are taking cell biological, molecular biological, and biochemical approaches coupled with newly developed imaging techniques.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/cell-dyna/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/cell-dyna/index.html</a>
Toshihide Kobayashi	kobayasi(at)riken.jp	Lipid Biology Laboratory focuses on the elucidation of molecular organization of lipids and lipid domains that are involved in cellular signaling. Our strategy is to visualize cellular lipids <i>in vivo</i> and reconstitute the lipid membranes <i>in vitro</i> . In order to visualize lipids, we develop proteins, peptides and small molecules that recognize specific lipids. The reconstituted membranes are evaluated by a variety of biophysical techniques. Those who have background in biochemistry, cell

		biology, molecular biology, biophysics and organic chemistry are encouraged to apply to the laboratory.  <a href="http://www.riken.jp/lbl/mainpagebl.html">http://www.riken.jp/lbl/mainpagebl.html</a>
Tadashi Suzuki	tsuzuki_gm(at)riken.jp	Research Subjects: (1) studies on mechanism of novel catabolic pathway for glycans; (2) functional role and evolutionary diversion of the cytoplasmic PNGase. Research Background Desired: Biochemistry; Cell Biology; Genetics; Mammalian Genomics.  <a href="http://www.riken.jp/engn/r-world/research/lab/frontier/sys-gly/glyco/index.html">http://www.riken.jp/engn/r-world/research/lab/frontier/sys-gly/glyco/index.html</a>
Naoshi Dohmae	dohmae(at)riken.jp	Biomolecular characterization. We develop high quality structural characterization methods to the biological science, aiming to further understand the mechanism and action of biological molecules.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/adsc/bio/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/adsc/bio/index.html</a>
Minoru Yoshida	yoshidam(at)riken.jp	Chemical genetics, a new approach to drug and drug target discovery in the post-genomic era. In our laboratory, biological functions of a number of proteins targeted by small molecules are studied by chemical genetics, functional genomics and proteomics. In particular, we focus on protein subcellular localization and protein modifications and their interplays such as acetylation, methylation ubiquitination, and sumoylation, which are regulated by small molecules.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/chemi-gene/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/chemi-gene/index.html</a>
Shogo Matsumoto	smatsu(at)riken.jp	Molecular Entomology. Using two principal model insects, the silkworm, <i>Bombyx mori</i> , and the fruit fly, <i>Drosophila melanogaster</i> , we direct our efforts towards elucidating molecular mechanisms underlying fundamental biological events exhibited by insects.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/entomology/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/entomology/index.html</a>

Department	Type of Degree	Department Outline
<b>Material Sciences</b>	Doctor of Philosophy or Doctor of Science or Doctor of Engineering	<a href="http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/material.html">http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/material.html</a>
Faculty	Email	Key words & comments
Zhaomin Hou	houz(at)riken.jp	Organometallic Chemistry, Molecular Catalysis, Polymer Chemistry. Our research interest includes development of more efficient, selective catalysts for olefin polymerization and organic synthesis, organometallic complexes having novel structures or properties, and organic functional materials.

		<a href="http://www.riken.jp/lab-www/organometallic/eng/index_e.html">http://www.riken.jp/lab-www/organometallic/eng/index_e.html</a>
Satoshi Kamiguchi	Kamigu(at)riken.jp	Inorganic chemistry and catalytic chemistry. Our research interest is synthesis of multi-nuclear transition metal cluster complexes and their application to functional materials. Recent study is especially focused on utilization of sulfide cluster complexes as catalysts.
Yoshio Sakaguchi	ysakaguc(at)riken.jp	Spin-chemistry and photochemistry applied to the emission/conduction process of organic EL materials and organic semiconductors. The external magnetic field and the resonant microwave field control the goal of spin dependent reactions.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/adsc/chemi/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/adsc/chemi/index.html</a>
Tahei Tahara	tahei(at)riken.jp	Ultrafast Spectroscopy, Nonlinear Spectroscopy, and Single Molecule & Correlation Spectroscopy. We study 'complicated systems' in the condensed phase using advanced molecular spectroscopy. Especially, we now focus on (1) elucidation and control of ultrafast phenomena using advanced time-resolved spectroscopy, (2) study of soft interfaces using new nonlinear spectroscopy, and (3) study of the dynamics of complex systems in the femtosecond - millisecond time region. In the course of these researches, we develop new methods in molecular spectroscopy.  <a href="http://www.riken.go.jp/lab-www/spectroscopy/en/index.html">http://www.riken.go.jp/lab-www/spectroscopy/en/index.html</a>
Reizo Kato	reizo(at)riken.jp	Chemistry and physics of molecular materials, especially molecular conductors. The basic concept of our science is <i>organization of electrons, molecules, and crystals</i> . In order to reveal its mechanisms and develop methods for its control, we are carrying out basic studies on organization of electrons in strongly correlated electron systems, self assembling of molecules through supramolecular interactions, and fabrication of micro/nano-scaled crystals in the molecular device.  <a href="http://www.riken.jp/lab-www/molecule/index-e.html">http://www.riken.jp/lab-www/molecule/index-e.html</a>
Mikiko Sodeoka	sodeoka(at)riken.jp	Synthetic Organic Chemistry and Chemical Biology. Our research interests cover from transition metal-catalyzed enantioselective reactions to design and synthesis of intracellular signal transduction modulators and their application to the cell biology research.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/organic/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/organic/index.html</a>
Hiroshi Abe	h-abe(at)riken.jp	Development of medicine and diagnosis method based on organic chemistry. We create new functional molecule inspired from natural system. Especially, artificial nucleic acids are designed and synthesized. Specific subjects are: RNA interference technology for RNA medicine, bio-probe for imaging RNA or protein in living cells,

		new fluorescent compound, bio-molecular catalyst for organic chemical reaction. Students can learn organic chemistry, synthetic chemistry and molecular biology through the research.
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Department	Type of Degree	Department Outline
<b>Mathematics, Electronics and Informatics</b>	Doctor of Philosophy or Doctor of Engineering	This course takes the harmony of humanity, science, and technology as its theme and deals comprehensively with education and research on underlying theoretical concepts, hardware and software.  <a href="http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/mathematic.html">http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/mathematic.html</a>
Faculty	Email	Key words & comments
Katsumi Midorikawa	kmidori(at)riken.jp	Laser Physics and Engineering. Novel nonlinear phenomena caused by interaction of ultrashort intense laser pulses with matters are investigated for creation of coherent x-ray sources. Nonlinear optical phenomena in the soft x-ray region and generation of attosecond pulses are also pursued by use of high-order harmonics. In addition, applications of short wavelength and ultrashort laser pulses to material processing are studied.  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/laser-tech/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/laser-tech/index.html</a>
Hideki Hirayama	hirayama(at)riken.jp	We are studying on terahertz (THz) quantum devices and deep-UV emitting devices. Especially, we recently aim to develop 1-10 THz-band quantum cascade laser (QCL) and THz photo detector using semiconductor superlattices (SLs) and also 230-350nm-band deep-ultraviolet (UV) light-emitting diodes (LEDs) and laser diodes (LDs) using group III nitride semiconductors.  <a href="http://www.riken.jp/engn/r-world/research/lab/frontier/tera-wave/quantum/index.html">http://www.riken.jp/engn/r-world/research/lab/frontier/tera-wave/quantum/index.html</a>
Tetsuya Aoyama	taoyama(at)riken.jp	Organic semiconductor devices such as transistor, photovoltaic device and electroluminescence. Soft-optoelectronics with aggregated, aligned, or organized organic materials, which takes advantage of softness and flexibility in organic materials.
Keiji Ono	k-ono(at)riken.jp	Low temperature electron transport experiments on semiconductor nanostructures, especially quantum dots. Recently, we focus on electron-spin and nuclear-spin related effects in quantum dots.
Tomohiro Yamaguchi	tyamag(at)riken.jp	Physics and engineering of quantum nanoscale devices. Our main interest involves a search for novel phenomena in nanoscale devices based on carbon nanotubes, semiconductor nanowires or superconducting materials and its application to quantum functional devices.

Department	Type of Degree	Department Outline
<b>Human Support and Production Sciences</b>	Doctor of Philosophy or Doctor of Engineering	This course is divided into the two areas of manufacturing science and human support engineering. The area of manufacturing science deals mostly with materials science, manufacturing science, and thermal-fluid science, and the area of human support engineering deals with robotics and mechatronics, and mechanics and design.  <a href="http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/mechanical.html">http://www.saitama-u.ac.jp/rikogaku/english/education/doctor/mechanical.html</a>
Faculty	Email	Key words & comments
Hitoshi Ohmori	Tuelid(at)mvd.biglobe.ne.jp	Micro-mechanical fabrication, micro-mechanics, IT assisted fabrication  <a href="http://www.riken.jp/engn/r-world/research/lab/wako/materials/index.html">http://www.riken.jp/engn/r-world/research/lab/wako/materials/index.html</a>
Yusuke Tajima	tajima(at)riken.jp	Chemistry and physics of nanocomposite materials. We utilize the so called "nano-integration" approach for the construction of progressive composite materials from conventional materials and functionalized nanocarbons.

Department	Type of Degree	Department Outline
<b>Advanced Collaborative Research</b>	Doctor of Philosophy or Doctor of Engineering	<a href="http://www.saitama-u.ac.jp/rikogaku/content/dept_002_07_coll.html">http://www.saitama-u.ac.jp/rikogaku/content/dept_002_07_coll.html</a>
Faculty	Email	Key words & comments
Particle Physics		
Hiroyoshi Sakurai	sakurai(at)rarfap.riken.go.jp	Nuclear structure and dynamics of exotic nuclei, studied experimentally with fast radioactive ion beams through developing new methods.  <a href="http://www.riken.jp/engn/r-world/research/lab/nishina/isotope/index.html">http://www.riken.jp/engn/r-world/research/lab/nishina/isotope/index.html</a>
Tohru Motobayashi	motobaya(at)riken.jp	Experimental nuclear physics and nuclear astrophysics  <a href="http://www.riken.jp/engn/r-world/research/lab/nishina/samurai/index.html">http://www.riken.jp/engn/r-world/research/lab/nishina/samurai/index.html</a>
Yuko Motizuki	motizuki(at)riken.jp	Theoretical nuclear astrophysics; computer simulations of element synthesis and supernova explosions.

Institute	Type of Degree	Department Outline
<b>Saitama University Brain Science Institute</b>	Doctor of Philosophy or Doctor of Science	<a href="http://www.saitama-u.ac.jp/iron/hP-kenkyo/shinkou/nou.htm">http://www.saitama-u.ac.jp/iron/hP-kenkyo/shinkou/nou.htm</a>

Faculty	E-mail	Key Words & Comments
Jun Aruga	jaruga(at)brain.riken.jp	Neurodevelopmental disorders, Systematic behavioral analysis, Comparative genomics, Neuriteogenesis, Synapse formation, Signal transduction, Transcriptional regulation  <a href="http://lcn.brain.riken.jp/index.html">http://lcn.brain.riken.jp/index.html</a>
Kazuhiro Yamakawa	yamakawa(at)brain.riken.jp	Molecular Genetics of Neurological diseases. The laboratory is focusing on the researches of epilepsy and Down syndrome by using genetics, molecular biology, histology, mouse disease models.  <a href="http://www.riken.jp/engn/r-world/research/lab/nokagaku/cause/neuro/index.html">http://www.riken.jp/engn/r-world/research/lab/nokagaku/cause/neuro/index.html</a>
Kang Cheng	kcheng(at)riken.jp	Neuro Imaging, Functional Magnetic Resonance Imaging (fMRI), Neurophysiology, Cognition, Vision  <a href="http://www.riken.jp/engn/r-world/research/lab/nokagaku/rrc/func/index.html">http://www.riken.jp/engn/r-world/research/lab/nokagaku/rrc/func/index.html</a>
Hajime Hirase	hirase(at)brain.riken.jp	Neuron-glia communication; in vivo electrophysiology and imaging to investigate glial role in neural processing. astrocytes, synapses  <a href="http://www.riken.jp/engn/r-world/research/lab/nokagaku/circuit/senior/hirase/index.html">http://www.riken.jp/engn/r-world/research/lab/nokagaku/circuit/senior/hirase/index.html</a>

\*Replace (at) with @