



Master's/Doctoral Program in

# Life Science Innovation

*Tsukuba Science City*

# Welcome to the Life Innovation Degree Program!



Degree Program Leader  
**Sosaku Ichikawa**

Professor,  
Department of Life and Environmental Sciences,  
University of Tsukuba

The University of Tsukuba Life Innovation Degree Program provides opportunities for outstanding students from Japan and around the world to have unique educational and research experiences that will trigger the creation of innovations. The degree program provides excellent learning opportunities in Tsukuba and abroad, and facilitates interaction between students and world-class experts in six specialized areas: bioinformatics, food innovation, environmental management, biomolecular engineering, disease mechanism, and drug discovery. This degree program is unique in that it combines university expertise with practical knowledge from companies and research institutions that belong to the Tsukuba Life Science Promotion Council. Furthermore, not only faculty members from the University of Tsukuba and researchers from various research institutes and private companies in Tsukuba City, but also professors from top-ranked overseas universities such as the Oxford

Stem Cell Institute (UK), Wageningen University (Netherlands), Montpellier University, the University of Bordeaux (France), and ETH Zürich (Switzerland) will participate in this program, and Graduate students will also have the opportunity to receive advice from these world-class professors. You will also have the opportunity to experience an excellent research internship in a world-class laboratory of a company or research institution belonging to the Tsukuba Life Science Promotion Council. The practical skills you will gain from an internship in a company will give you a huge advantage in the competitive international job market.

In this degree program, researchers working in the real world conduct education and research with an image of the kind of human resources they actually want to develop. We sincerely welcome students who wish to acquire the ability to work immediately in society.

## Initiatives of Life Science Promotion Association of Tsukuba

Various national institutes were established in Tsukuba district about 40 years ago to respond to the demands for the promotion of higher education in science and technology. Many research laboratories from the industries were also established. Since then, there have been more than 300 national and industrial institutes in Tsukuba district, serving as the world-leading science city. "Life Science Promotion Association of Tsukuba" was established to promote collaborative research & development in the life science field in Tsukuba Science City. The association also aims to contribute to society by helping in the revitalization of education, research and development, and industry. New businesses will be established through "industry-academic-government collaboration" and by taking advantage of the bioresources made available to the members of the association.



## Akihiro Mizoguchi (Doctoral course, entering in 2020)

Bioinformatics

The Life Innovation degree program is filled with opportunities to learn cross-disciplinary knowledge and ideas from lectures given in English by renowned national and international researchers.

Since the COVID-19 pandemic, people have become more health conscious I believe that people's health-consciousness has become stronger since the COVID-19 pandemic, and in response, expectations for researchers have also increased. In

this program, students will be able to develop their individual technical and thinking skills through interdisciplinary and international research activities and lectures. In addition, there are many international students in this program, and sharing a variety of cultures through communication with them makes us special.

Take the first step toward becoming the person who will support the future with this Life Innovation degree program!

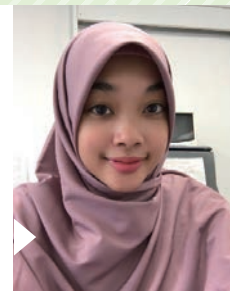
Food Innovation

## (Doctoral course, entering in 2019) Annisa Krama YUDHI

I can't imagine I will have such of great experience being a student in T-LSI program. My dream is to become a researcher that is able to improve human life, then I have found T-LSI is the best choice.

During this program, research and lectures are the key focus in this program, so that we can improve our creativity in life science. Furthermore, this program motivates us to be involved in life science community which has various kinds of specialized

studies. We are also provided a good chance to have quality time with professional researchers coming from university, companies, and research institutes. This learning mechanism makes this program unique. Without any doubt, I believe that studying in T-LSI will be your turning point for your future life. So, let's catch your dream with T-LSI!



## Yike Wang (Doctoral course, entering in 2020)

Environmental Control

"World winds and clouds my generation, and into river the lake years urges." In my 28 years of being alive, 21 years spent in school passed by quickly like a river. The T-LSI program unifies different disciplines and provides us with a variety of academic perspectives. I am very grateful that the program can provide me with a change to be in a battlefield full of challenges dealing with scientific problems and provides me with assistance in pursuing research..

Finally, I want to say to everyone to be determined in walking this road and even when dealing with "storms" in your academic life, to not stop and just go forward!

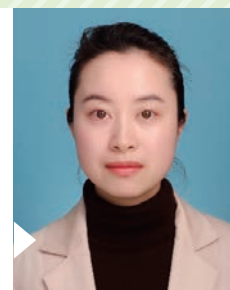
Biomolecular Engineering

## (Master's course, entering in 2020) Yaxi Tian

Being a student of LSI of the University of Tsukuba is one of the greatest treasures in my life.

In the aspect of academic environment, it is such an international university with advanced education resources. LSI master's course provides a broad view of biological science. Professors and students are coming from all throughout the world; what we learned is closely connected to the outside world in real time. Concerning students' living condition and future

career, various national sponsors provide scholarship to LSI students, which is a strong support to hard-working students. In my experience, I setup research related network by internship program, and I can see the future career path from there.



## Mallika Khurana (Master's course, entering in 2020)

Disease Mechanism

I am very pleased to be accepted into Master's in Life Science Innovation (Disease Mechanism) and am very thankful to MEXT that has given me this opportunity to study in Japan, at a world class university with such a prestigious scholarship.

In this program I am being taught 'drug innovation' as a skill -which is the need of the hour- by highly renowned professionals and professors not only from Japan but also from other countries, which makes this program highly international. I am

also experiencing and learning from world class cellular research facilities at AIST, which is a Japanese government science research institute.

Overall, I would say that TSLI is one of the few programs offered in the world that prepares the student for the industry and is not only focused on education but plays a key role in rounding up the student's skill set to be prepared to innovate in a research setting at an industrial scale.

Drug discovery

## (Master's course, entering in 2020) Takumi Suzuki

We believe that the Life Innovation degree program is the best program to acquire a cross-sectional perspective on research fields, internationality, industry, government, and academia.

Our research is divided into six areas: disease mechanism, drug discovery, food innovation, environmental management, bioinformatics, and biomolecular engineering. All of these areas come together in research presentations, and we have lively discussions based on our findings. All classes are held in English,

and more than half of the students are international students, which can be difficult for me as I am not good at English, but it is a good environment for Japanese students who want to learn English. In addition to university professors, there are also lectures by people from companies and research institutes, as well as internships outside of my own laboratory, which allow me to come into contact with perspectives that are not limited to the university.



# Cutting Edge Learning

Tsukuba Science City × Top Overseas Universities

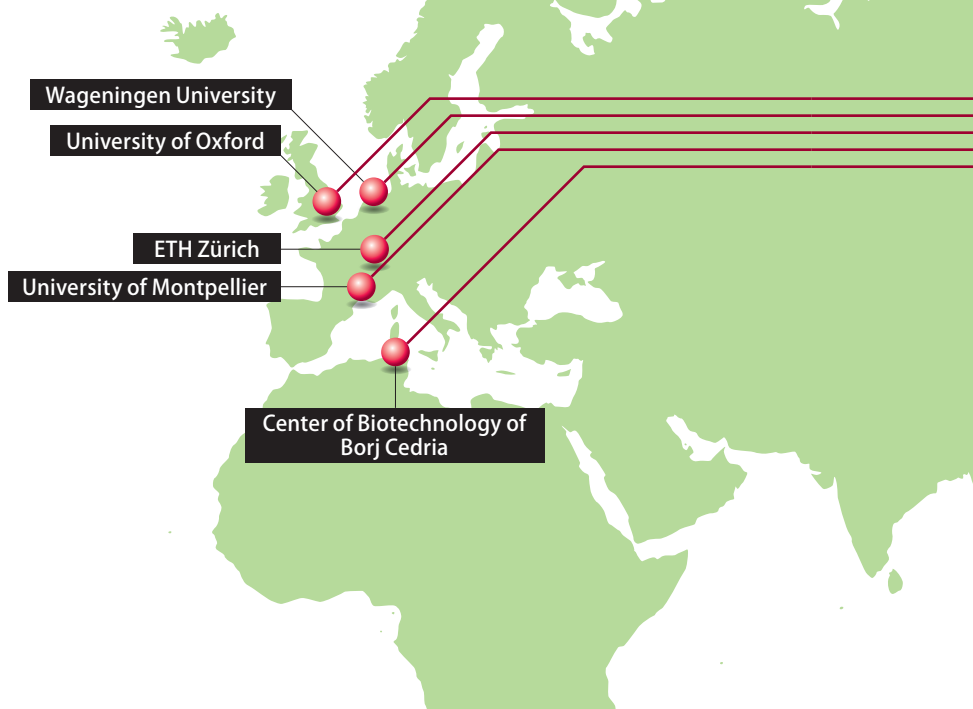
Under the active participation in education and research not only by the faculty of the university but also by the faculty of the collaborative Graduate Student of research institutions belonging to the Tsukuba Life Science Promotion Council, students will study unsolved issues in society and conduct research activities with the aim of opening up new developments in the field of life science.

While being a student affiliated with the University of Tsukuba, you can conduct research at research institutions such as AIST.

Lectures and seminars are given by leading researchers from overseas institutions, giving students not only a world-class learning experience, but also the opportunity to learn about world-standard research skills. All lectures are given in English, as the degree program is designed to be internationally compatible.

## Main Lecturers

- Prof. Colin Goding**  
Ludwig Institute for Cancer Research, University of Oxford
- Prof. Virginie RAGE ANDRIEU**  
University of Montpellier
- Prof. Remko Boom**  
Wageningen University
- Prof. Stephen Mayfield**  
University of California, San Diego
- Prof. Peter Johann Walde**  
ETH Zürich
- Prof. Francesca Meteora Buffa**  
University of Oxford



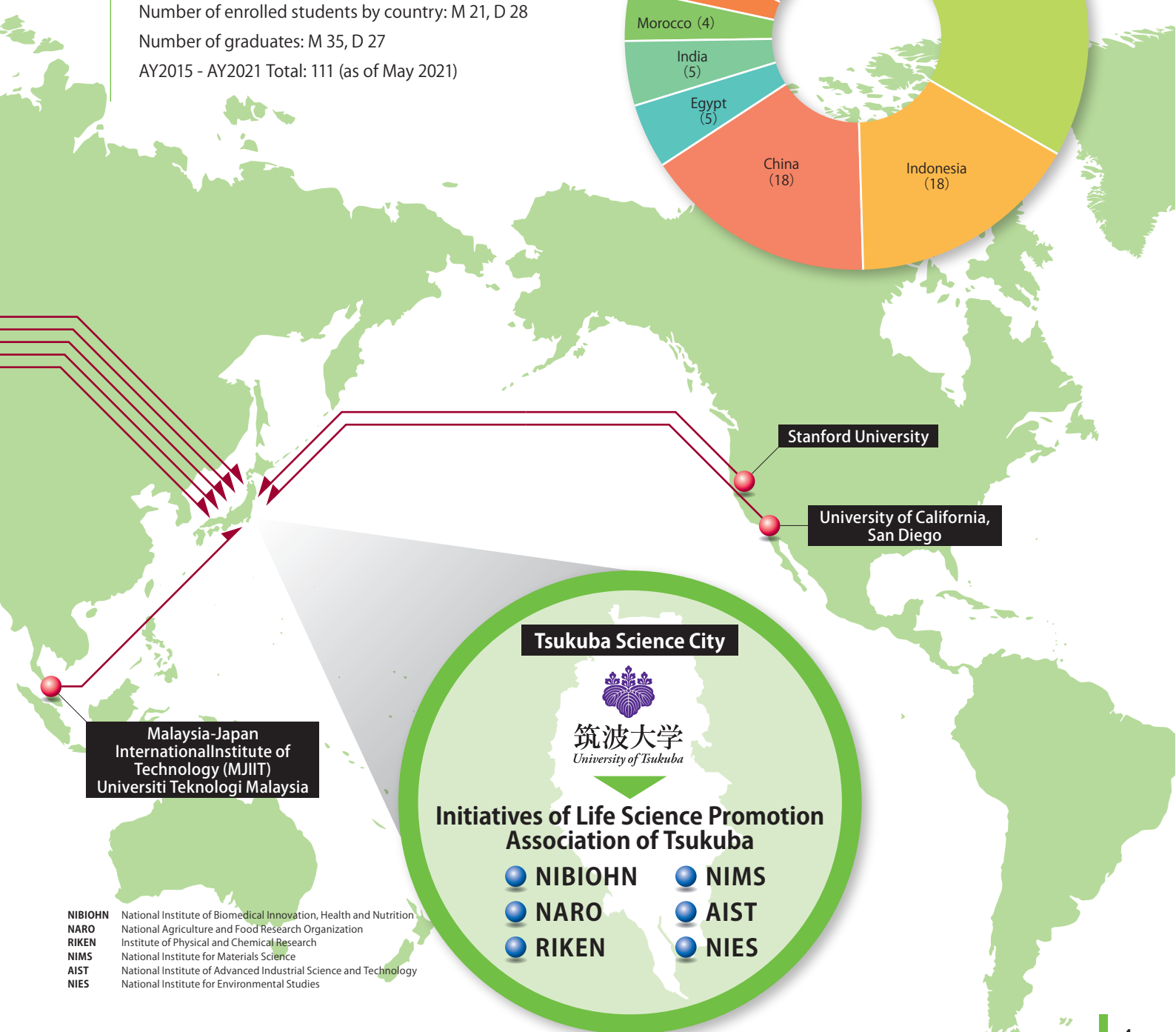
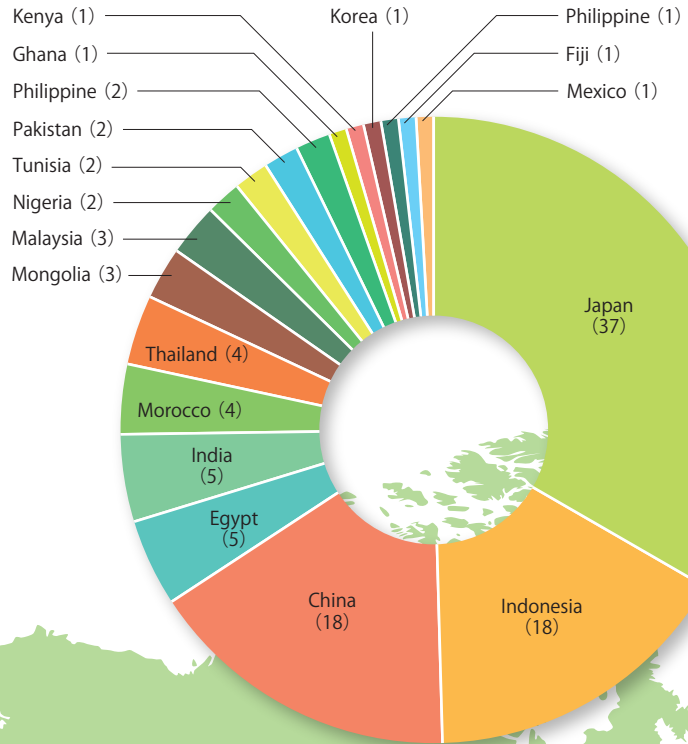


## Students from all over the world gather to seek opportunities around the world.

Number of enrolled students by country: M 21, D 28

Number of graduates: M 35, D 27

AY2015 - AY2021 Total: 111 (as of May 2021)



Malaysia-Japan International Institute of Technology (MJIT)  
Universiti Teknologi Malaysia

Stanford University  
University of California, San Diego

**Tsukuba Science City**

筑波大学  
University of Tsukuba

**Initiatives of Life Science Promotion Association of Tsukuba**

- NIBIOHN
- NARO
- RIKEN
- NIMS
- AIST
- NIES

**NIBIOHN** National Institute of Biomedical Innovation, Health and Nutrition  
**NARO** National Agriculture and Food Research Organization  
**RIKEN** Institute of Physical and Chemical Research  
**NIMS** National Institute for Materials Science  
**AIST** National Institute of Advanced Industrial Science and Technology  
**NIES** National Institute for Environmental Studies

# Six Areas of Expertise

## New Steps in Life Science

TLSI program offers six Fields of Specializations in order to provide an interactive and interdisciplinary environment for the students to master their research skills and obtain relevant degree.

### Bioinformatics



With the advancement of modern technologies robust equipment were being developed in the field of life sciences. This resulted in rapid accumulation of biological data and in turn the demand for computational biologists to solve life science problems increased. In order to address this issue, we aimed at training and producing young bioinformatics scholars. Here, students from diverse backgrounds are encouraged to acquire computational, biological and mathematical skills, and communication skills. Our groups are mainly focused on big data analysis, molecular simulations, genetic regulation and network analysis, and the mathematical modelling of biological systems. Bioinformatics research and training at TLSI help students to explore a wide range of interdisciplinary research areas in Biology and computational sciences.

### Food Innovation



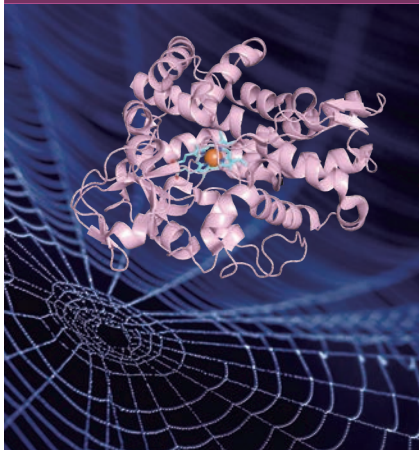
There is a need for globally competitive human resources who have the necessary skills for the creation of a new value for foods. Innovative functional food development will contribute to the realization of a healthy and longevity society that will promote life innovation, and contribute to international competitiveness and economic growth. TLSI's Food Innovation students acquire both a cross-sectional and bird's-eye view of life science innovation and at the same time, gain a world-class and advanced specialized research skills that will enable them to serve as catalysts for new developments in life science research. TLSI students who majored in Food Innovation will be highly specialized professionals can serve an active role in the field of research and development, and management of functional foods and cosmeceuticals.

### Environmental Control



Life, including humanity, is determined to survive and grow depending on the surrounding environmental conditions. In recent years, keywords such as food safety and sustainable use of bioresources, which have attracted social attention, are closely related to appropriate control of the environment. Therefore, we learned widely from the relationship between life survival and growth and environmental conditions, that is, from microscopic environmental physiology to macroscopic environmental ecology on a global scale, and the latest on environmental impact assessment and control. Training human resources who can acquire global expertise and research and can play an active role globally in the field of research and development related to appropriate control of the environment.

## Biomolecular Engineering



The development of materials that focus on the functionality of biomolecules is expected to contribute to the realization of innovative analytical technologies and functional materials with high environmental and biocompatibility. Deepen understanding of the functions of biomolecules, learn widely about the application development of biomolecules to functional materials, acquire project management technology related to them, and develop innovative analytical technologies and functional materials with high environmental and biocompatibility. We train human resources who can accelerate life innovation through realization, that is, human resources who can accelerate innovation through the fusion of biology / medicine and engineering.

## Disease Mechanism



The elucidation of the pathological mechanism is expected not only to develop innovative treatments for diseases, but also to revitalize the economy by creating solutions for the aging society with declining birthrates ahead of the rest of the world. Therefore, we will train human resources who will develop innovative knowledge in the field of biomedical science and human resources who will be active in the medical field with a wide range of knowledge, with the goal of returning research results to society.

## Drug discovery



There is a need for innovative medicines that can solve unmet medical needs in response to social conditions. Therefore, by grasping the trend of medical needs according to the times, we have acquired the ability to design drugs and the ability to verify the effects of drugs through regulatory science, organic chemistry, drug discovery chemistry, and pharmacology. Train human resources who can contribute to the creation of innovative drugs by acquiring the ability to design drugs and the ability to verify the effects of drugs through regulatory science, organic chemistry, drug discovery chemistry, and pharmacology.

# Educational Policy and Curriculum

## Degree Awarding Policy (Diploma Policy)

The degrees will be conferred to the candidates who meet the academic requirements set by the TLSI program (the required units of coursework and thesis in the student's research field) and obtain research results for their thesis that builds upon the student's concentration, either for master's or doctoral degrees, in Disease Mechanism, Drug Discovery, Food Innovation, Environmental Management, Biomolecular Engineering, and Bioinformatics. The thesis will be reviewed by the thesis committee in a final examination to validate that the student has the following competencies.

### Master's Program

#### [Generic Competences]

- 1 Ability to use knowledge :**  
Ability to put advanced knowledge to use in society
- 2 Management ability :**  
Ability to appropriately address challenges from every angle
- 3 Communication ability :**  
Ability to express expert knowledge accurately and clearly
- 4 Group skill :**  
Ability to cooperate and actively contribute to the achievement of goals as a team
- 5 Global competency :**  
Awareness to contribute to international society

#### [Specific Competences]

- 1 Innovation potential :**  
Creative thinking ability for use in the field of life sciences
- 2 Expertise :**  
Excellent knowledge and operation skills in one's own specialized field
- 3 English language proficiency :**  
Proficiency in the use of the English language for communicating, understanding, and expressing ideas in life science field

### Doctoral Program

#### [Generic Competences]

- 1 Ability to create knowledge :**  
Ability to create new knowledge to be able to contribute to future society
- 2 Management ability :**  
Ability to plan and implement measures to identify and solve challenges from a higher perspective
- 3 Communication ability :**  
Ability to express the nature of academic findings positively and clearly
- 4 Leadership ability :**  
Ability to accomplish objectives under one's leadership
- 5 International character :**  
High level of awareness and motivation to be internationally active and contribute to international society

#### [Specific Competences]

- 1 Innovation potential :**  
Ability to produce novel innovations in the field of life sciences
- 2 Expertise :**  
The latest knowledge on the specialized field
- 3 English language proficiency :**  
Ability to communicate using the English language when carry out all research-related activities in international setting

## Curriculum Policy

To develop cross-disciplinary and holistic view on world-class advanced and specialized research skills, aside from the lectures conducted by the members of the faculty of the university, seminars are also given by renowned researchers from overseas research institutions and from Tsukuba Life Science Promotion Council. The course curriculum was organized into two categories:

1. Common subjects to learn basic concepts, and
2. Specialized subjects to develop specialized skills in each field.

In addition, internship courses that are part of career education and courses for studying business contents of research institutions are organized.


Students take not only these courses but also acquire the knowledge and competencies set forth in the Diploma Policy and assessed through achievement assessment, Master's thesis submission, conference presentations, attendance in workshops among others. In line with these, recently, we have organized several workshops and visits to private companies for TLSI students.



# Course list and Degree Awarding

## Course List

## Degree to be awarded

	Course List	Degree to be awarded	
Master's Program	<b>Basic Subjects</b> Introduction to Medicine Introduction to Drug Discovery Introduction to Food Science Introduction to Bioresource Introduction to Natural History Basic Bioinformatics Management in Pharmaceuticals and Food Regulatory Science Practices in Life Science Innovation Team Learning in Life Science Innovation Responsible Conduct of Research Master's Life Science Innovation Seminar Master's Internship		
	<b>Specialized Subjects (Common)</b> Life Science Innovation Master's Special Seminar I/II Spring/Fall Life Science Innovation Master's Special Research I/II Spring/Fall		<b>Disease Mechanism</b> Master of Disease Mechanism
	<b>Specialized Subjects (Bioinformatics)</b> Computational Biology Biomolecule and Medical informatics Gene analysis and Functional genomics		<b>Drug Discovery</b> Master of Medical Science
	<b>Specialized Subjects (Food Innovation)</b> Food Process Engineering Food Functionality Food Safety		<b>Food Innovation</b> Master of Food Innovation
	<b>Specialized Subjects (Environmental Management)</b> Habitat and Functional Compound Biomass Science Water Environment and Life Science		<b>Environmental Management</b> Master of Environmental Management
	<b>Specialized Subjects (Biomolecular Engineering)</b> Biomaterials Science Biomolecular Engineering Project Management		<b>Biomolecular Engineering</b> Master of Bioengineering
	<b>Specialized Subjects (Disease Mechanism)</b> Molecular and Cellular Biology of Disease I Molecular and Cellular Biology of Disease II Advances in Cellular Regulation		<b>Bioinformatics</b> Master of Bioinformatics
	<b>Specialized Subjects (Drug Discovery)</b> Introduction to Medicinal Chemistry Translational Science in Drug Discovery Pharmaceutical Design Engineering		
Doctoral Program	<b>Basic Subjects</b> Human Subjects Research: Basic Doctor's life science innovation seminar Doctor's Internship I/II	<b>Disease Mechanism</b> Doctor of Philosophy in Disease Mechanism	
	<b>Specialized Subjects</b> Life Science Innovation Doctor's Special Seminar I/II/III Spring/Fall Life Science Innovation Doctor's Special Research I/II/III Spring/Fall	<b>Drug Discovery</b> Doctor of Philosophy in Medical Science	
		<b>Food Innovation</b> Doctor of Philosophy in Food Innovation	
		<b>Environmental Management</b> Doctor of Philosophy in Environmental Management	
		<b>Biomolecular Engineering</b> Doctor of Philosophy in Bioengineering	
		<b>Bioinformatics</b> Doctor of Philosophy in Bioinformatics	

# Timeline

Before entrance examination

Applicants contact a faculty member who supervises their graduation researches

## Master's program

1st year	Enrollment in April	Enrollment in October
Orientation Assignment of Vice Supervisors	April	October
Achievement Evaluation I ※1	February	September
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2nd year	Enrollment in April	Enrollment in October
Mid-term Presentation (T-LSI Student Workshop) ※2	September	February
Achievement Evaluation II	December	May
Submission of master's thesis	January	June
Public Presentation (Final examination, T-LSI Student Workshop)	February	September
Degree award	March	September

## Doctoral program

1st year	Enrollment in April	Enrollment in October
Orientation Assignment of Vice Supervisors	April	October
Achievement Evaluation I	February	September
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2nd year	Enrollment in April	Enrollment in October
Mid-term Presentation (T-LSI Student Workshop)	September	February
Achievement Evaluation II	February	September
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3rd year	Enrollment in April	Enrollment in October
Preliminary examination / achievement evaluation III	October	April
Doctoral dissertation submission	December	May
Final examination (Defense)	January	June
Degree award	March	September

### ※1 Achievement Evaluation

The achievement evaluation committee, which consists of a main supervisor and two sub supervisors, evaluates the status of learning toward the acquisition of competence. Students are encouraged to self-evaluate their academic achievements in the self-evaluation sheet. The Achievement Evaluation Committee performs evaluation based on the self-assessment submitted by students and their presentations on research progress. The evaluation results are fed back to the students and the competencies are acquired more reliably.

### ※2 T-LSI Student Workshop

Every September and February, our program organizes a workshop for all TLSI students and faculty members. In this workshop, all students will present research activities, discuss and communicate with students and researchers with different backgrounds. In addition, our program gives the best presentation award to the student who makes excellent presentation.

## University of Tsukuba Doctoral Program Early Completion Program for Working People

<https://www.tsukuba.ac.jp/en/academics/g-courses-s-program/>

●Please download the brochure from the program's website for more information, including application guidelines, screening requirements, and the admission process.



# Admissions

We are looking for students who have ability to innovate!

## Admission Policy

### Master's Program

We seek students who are highly motivated and open to take up new challenges in the specialized fields. To get admitted into the program students should be able to demonstrate their research expertise, knowledge and innovative potential on the specialized field of interest. In addition, student's English language ability to communicate, acquire and publish advanced practical skills and scientific innovations is welcomed.

#### (Admission criteria)

- Document review will assess whether you have the bachelor level knowledge necessary to study in this degree program and whether you have the ability to explain the research background and future prospects in English.
- The English proficiency test will be used to assess whether you have the English proficiency (B2 or higher according to CEFR standards) required for studying in this degree program.
- The oral examination will evaluate your creativity and willingness to welcome innovative thoughts in your specialized field and your ability to explain and discuss in English.

### Doctoral Program

We seek students who are highly motivated and open to take up new challenges in the specialized fields. To get admitted into the program students should have their research expertise, knowledge and innovative potential on the specialized field of interest. In addition, the students need English language ability to communicate, acquire and publish advanced practical skills and scientific innovations.

#### (Admission criteria)

- Evaluation committee will assess whether you have master's level expertise (excellent grades in the enrolled course), ability to explain the research background, research plan, and social return of research results in English.
- The English proficiency test will be used to assess whether you have the English proficiency (B2 or higher according to CEFR standards) required for conducting research activities in this degree program.<sup>※1</sup>
- The oral examination will evaluate innovative potential and the willingness to achieve novelty in specialized fields.

※1 To take an entrance examinee, you need TOEIC Listening & Reading Test Official Score Certificate with photo identification, TOEFL-PBT or iBT Examinee' s Score Record with photo identification, or IELTS (Academic Module) Official Test Report Form with photo identification of either of the examination you took in the past two years.

## Entrance examination information



- Examination season: August (April admission), January-February (April or October admission)
- Enrollment Capacity: 12 (Master's program), 9 (Doctoral program)
- Application guidelines are posted on the University of Tsukuba Graduate School Application Guidelines website (<https://eng.ap-graduate.tsukuba.ac.jp/course>).

## Q&A

### Q Can you introduce my perspective supervisor before the entrance examination?

**A** You can check the research fields and research content of your academic advisor on the Life Innovation Degree Program website. In addition, there will be time for a question-and-answer session at the entrance exam briefing session, so please come and join our briefing session.

### Q Should I visit to University of Tsukuba to take the oral examination?

**A** The applicants living overseas can take the oral examination using ZOOM.

### Q I would like to receive a scholarship.

**A** TLSI does not offer any financial support to its students but incoming and current students are encouraged to apply for scholarship grants offered by Japan Student Services Organization (JASSO), by local governments, and private organizations. For more details, please access the "Student Support" page of our HP and the Official HP of the University of Tsukuba.

### Q Can I choose the time of admission?

**A** You can choose to enroll in April or October of the following year only when you take the entrance examination in January-February.

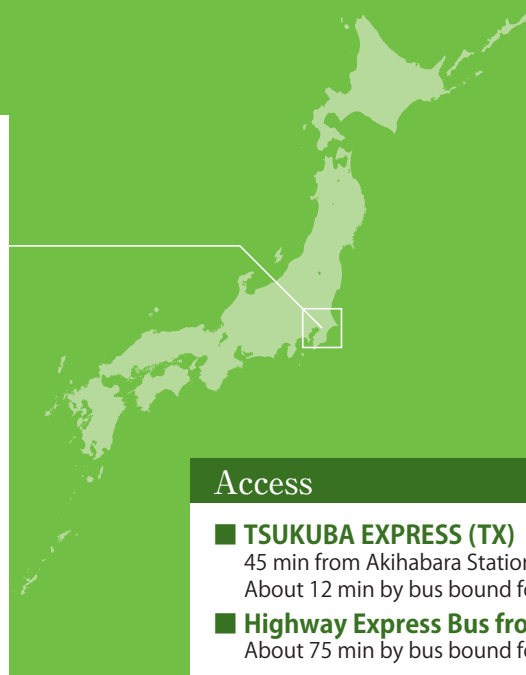
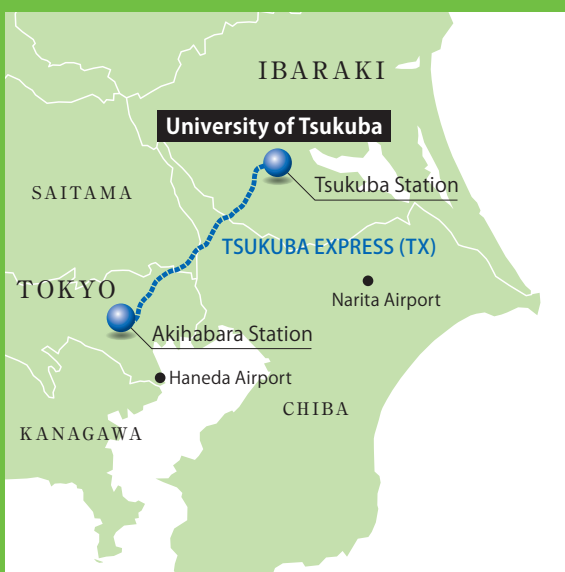
### Q What is required for the English proficiency test?

**A** You will need to submit the results of either the TOEIC public test, TOFEL-iBT, or IELTS academic module within the past two years.

For detail, please see the "Admissions" page of our website.

# IMAGINE THE FUTURE.

## Breakthrough Innovation Across Border



**Access**

- **TSUKUBA EXPRESS (TX)**  
45 min from Akihabara Station to Tsukuba Station by rapid train.  
About 12 min by bus bound for "Tsukuba Daigaku Chuo"
- **Highway Express Bus from Tokyo Station**  
About 75 min by bus bound for "Tsukuba Daigaku"

