

Plant Stem Cell Regulation and Floral Patterning /

Ito Lab's HP



Well come to Ito Laboratory!

We are interested in a holistic view of gene regulation in plant reproduction, which leads to developmental robustness and coordination.

We explore signaling and epigenetic control in stem cell maintenance, environmental response and fertilization.

These studies will serve as a basis of plant growth optimization for improved crop plant yields.

Our students work at the frontiers of plant molecular genetics, developing their research, presentation and writing skills.

- Prof. Toshiro Ito in NAIST since 2015. 1997 Ph. D., Kyoto Univ
- Research Theme/Control of floral stem cell proliferation and differentiation, and epigenetic regulatory mechanisms underlying environmental responses.
- Publication/*Nature, Science, Genes & Dev., PloS Bio., Plant Cell, Current Bio., Nature Comm., Nature Genetics, PNAS, Development* etc



Wild-type Arabidopsis flowers (left) and, mutant flower (right). In the mutant, stem cell petals and sepals continue to increase. Let's work together with us to clarify molecular mechanisms of flower development.

Things do always work out!



Professor Toshiro Ito.

Introduction of the Ito Laboratory Staff

Elucidation of gene function in response to environmental changes

Histone modifying enzyme



High temperature responsive gene

We study how plants memorize environmental temperature and light conditions and reveal the molecular mechanisms that confer the plasticity and robustness of the cascades under various environmental stimuli.



Please join us and explore the mechanism of transcription.

Associate Professor (2015 ~)

Nobutoshi Yamaguchi

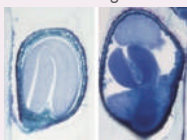
2009 Ph.D., Tokyo Univ.

<Publication>

Science 2014, *Dev Cell*, *e-life*, *PNAS*, *Development* etc

Epigenetics of dominant/recessive relationships

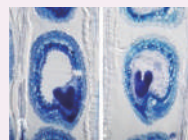
Seed enlargement



Wild type

Parental double knockout mutant

Seed size reduction



Wild type

Paternal gene knockout mutant

Pollen factors functioning for self-incompatibility are governed by a complex dominance hierarchy. We study the mechanisms of these dominant / recessive relationships regulated by a small RNA-based epigenetic mechanism and its evolution in Brassicaceae.



Let's explore plant epigenetics!

Assist Professor (2017 ~)

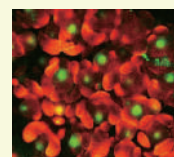
Yuko Wada

2003 Ph.D., NAIST.

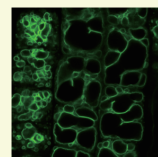
<Publication>

Nature Plants, *PNAS*, *Genetics*, *JBC*, *PCP* etc

Elucidating the role of organelles in the control of flower development



Floral stem cells



Plant vacuole

The vacuole, the largest organelle in plant cells, plays essential roles in plant growth and development. By investigating the functions of proteins localized in the vacuole, we aim to understand the molecular mechanisms by which plants regulate flowering.



Let's unravel the world of plant cells together.

Assist Professor (2026 ~)

Yihong FENG

2020 Ph.D., Kyoto Univ.

<Publication>

Nature Plants, *FEBS Letters*, *Chemistry-A*, *European Journal*, *JACS* etc

Translational research were topics by Ito Laboratory

Contributing to sustainable food production in a global arming.

Fundamental Technologies for Increased Food Production

- 1 Fruit size and numbers seed
- 2 Life span of flowers
- 3 Global warming-resistant plants
- 4 Substance enabling flowering time control

Access to Ito Laboratory

BIOLOGICAL SCIENCE Building C, 3rd floor / C315, C316

<https://bsw3.naist.jp/ito/>



2021, 2022, 2023, 2025

Master's Thesis Best Student Award

2023, 2024, 2025

& Best Doctoral Thesis Student Award

CONSECUTIVE YEARS!!

2025



Outstanding Student Award / Rin Ishiyama
Outstanding Student Award(PhD)/ Yuki Furuta

2024



Outstanding Student Award(PhD)/ Nana Otsuka

2023



Outstanding Student Award / Nagisa Miyajima
Outstanding Student Award(PhD)/ Risa Kobayashi

2022



Yano Prize / Yuki Furuta
Outstanding Student Award / Ryoko Ebihara

2021



Yano Prize/ Nana Otsuka
Outstanding Student Award/ Tamaki Shitabo

2026

Ito Laboratory M1 Schedule

4/9 (Thu)

Main Lecture Hall / L11

Lecture on Research Topics
General Laboratory Introduction

17:44 - 18:02 Introduction by Ito Laboratory

4/10 (Fri)

Refresh Corner, 3rd Floor, Building C

Social Gathering Hosted by

17:50 - 20:00 Senior Members of the Ito Lab



The Welcome Social Event requires advance registration due to pizza ordering arrangements. Please register by April 10(12:00)! Free!!

4/13 (Mon)

First Preference Survey for Laboratory Assignment

C315 Laboratory Visit Laboratory Tour with Current Students

16:50 - 17:30 (Prof. Ito/Assistant Prof. Wada)

17:40 - 18:20 (Prof. Ito/Assistant Prof. Feng)

4/14 (Tue)

Individual Interview with the Academic

4/15 (Wed)

C315 Laboratory Visit Laboratory Tour with Current Students

16:10 - 17:00 (Prof. Ito/Assistant Prof. Wada)

17:10 - 18:00 (Prof. Ito/Assistant Prof. Feng)

4/16 (Thu)

Second Preference Survey for Laboratory Assignment



C315 Individual Visits Available Anytime

Visits by Appointment Required

Please make a reservation by email to the Ito Laboratory

※The following dates and time slots are subject to consultation

4/17 (Fri)

16:10 - 18:00 Consultation Required

20-21 (Mon) (Tue)

Consultation Required

4/22 (Wed)

Final Preference Survey for Laboratory Assignment

Dec.

Presentation at the 49th Annual Meeting of the MBSJ (Pacifco Yokohama)

'27 Mar.

M1 Pre-Master's Thesis Presentation; Presentation at the 68th Annual Meeting of the JSPF

'28 Feb.

Master's Thesis Presentation

For Students Advancing to the Doctoral Program Only

Voices of Graduate 2025 (excerpt)

Check out what our past graduates have to say!



Best Student Award



Rin Ishiyama / Employment

In the laboratory, you are surrounded by professors, caring and supportive technical staff, dependable peers, and warm-hearted senior and junior members. When you encounter difficulties, do not shoulder everything on your own—please rely on those around you.



Yuka Ousaka / Employment

The experience of devoting yourself fully to your research will become a valuable asset for you and will surely prove useful at some point in the future. Please cherish your time at Ito Laboratory and enjoy it.



Sena Harada / Employment

At Ito Lab, there are professors and technical assistants who are always willing to offer guidance when you need advice, as well as senior members and peers with whom you can learn from and inspire one another. In such a supportive and enriching environment, make the most of your time and lead a fulfilling research life without regrets.



Sayaka Okamoto / Employment

The two years will pass by in the blink of an eye. Make the most of your time and give it your all, so you have no regrets. The everyday moments you spend with your peers will support you more than you might expect. Enjoy your two years in the Ito Lab.



Hikari Kitani / Enrollment at another university

Ito Lab provides an environment where you can fully dedicate yourself to your efforts. Although the two years were short, I believe I was able to gain a wealth of experience and grow significantly.



Seiu Yamazaki / Enrollment at another university

Ito Laboratory is well equipped with advanced instruments, and both the faculty members and fellow lab members are always willing to offer sincere support and advice, making it an excellent research environment.



Ryosuke Ota / Enrollment at NAIAT

Many of you may feel anxious about moving into a different field; however, the faculty members provide kind and attentive support, carefully guiding you from the basics. Please feel at ease and take on the challenge of a new field.

Main places of employment

Astellas Pharma Inc./Advantec Co., Ltd./Asakura Publishing Co., Ltd./IQVIA Services Japan G.K./EPS Co., Ltd./NTT DATA KANSAI CORPORATION/NTT WEST, Inc./AIR WATER INC./Kazusa DNA Research Institute/DNA Chip Research Inc./Oyatsu Company, Ltd./Noevir Co., Ltd./FUJI YAKUHIN CO., LTD./The Musashino Seed Co., Ltd./KAMEDA SEIKA CO., LTD./KENKO Mayonnaise Co., Ltd./SANYO FOODS Co., Ltd./Sato Pharmaceutical Co., Ltd./SANYO FOODS Co., Ltd./Shikibo Ltd./Sumitomo Rubber Industries, Ltd./Takii & Co., Ltd./WDB Co., Ltd./TSUNO CO., LTD./Nanto Seed Co., Ltd./Japan Corn Starch Co., Ltd./Nippon Paper Industries Co., Ltd./Nosan Corporation./House Foods Corporation/ZACROS Corporation/Mitsubishi Corporation Life Sciences Limited/METAWATER Co., Ltd./Morishita Jintan Co., Ltd./ABeam Consulting Ltd./Hokko Chemical Industry Co., Ltd./Kaigen Pharma Co., Ltd./Nihon Kolmar Co., Ltd./Foundation for Promotion of Material Science and Technology of Japan/A2 Healthcare Corporation/Medisience Planning Inc./NTT DOCOMO, INC./DAITO CACAO CO., LTD./Asahi Breweries, Ltd.