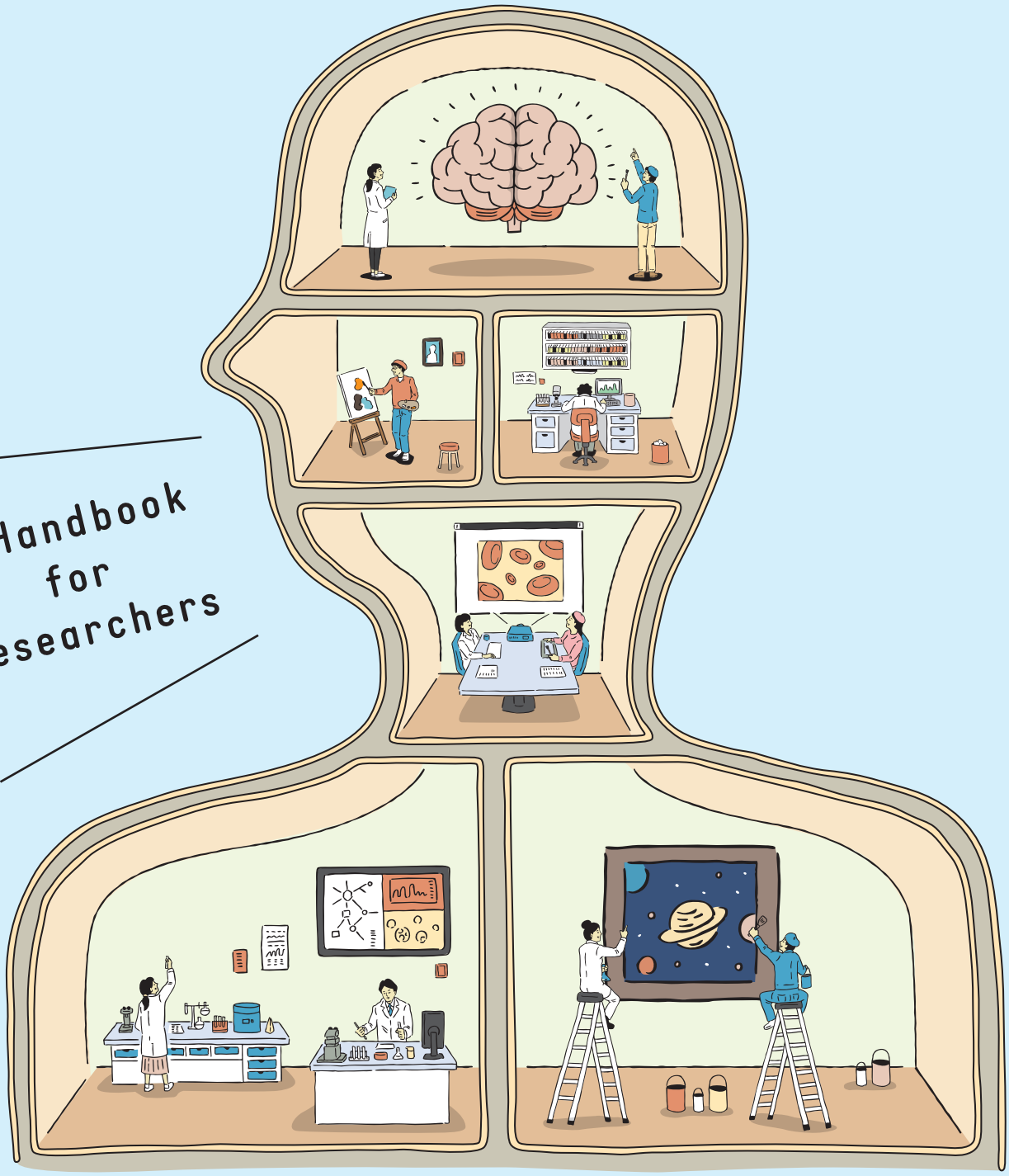
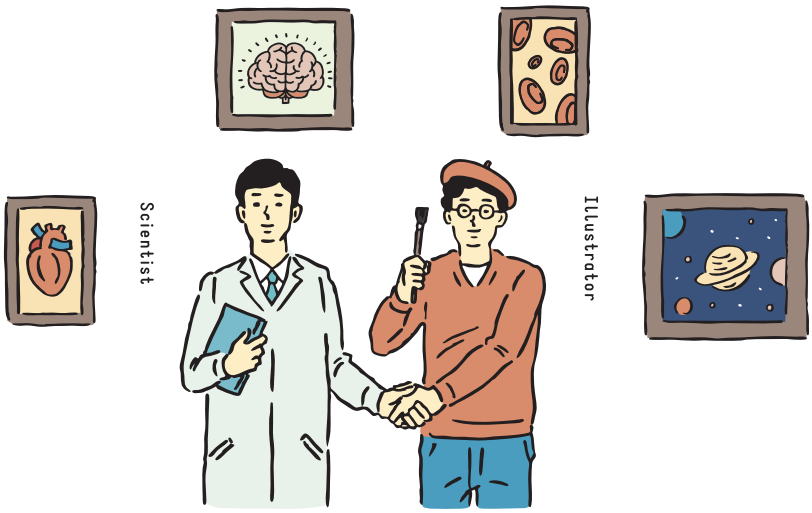
Working with
Professional Illustrators to

Visualize Your Science

A Handbook
for
Researchers



Let's collaborate with science illustrators



Contents

Preface

A scientific illustration is an image that presents scientific knowledge or concepts in a manner that is easy to understand. It is an excellent form of media for conveying the essence of your research to non-specialists at a glance. Good examples of illustrations can be found in general scientific magazines and textbooks.

In recent years, outreach has become increasingly important for the appeal of your research to reach beyond scientific audiences and to the greater public. Science illustrations are an excellent means of efficient and effective outreach.

Maybe you already know this. Perhaps you already want to promote your research through scientific illustration, but don't know where to start.

The purpose of this booklet is to provide the information necessary for commissioning and producing scientific illustrations. Specifically, you will find examples of scientific illustrations, expected fees, schedules, points of caution when making a commission, and introductions to several scientific illustrators and production companies.

We hope you will find this booklet a useful guide for the production of scientific illustrations and a helpful resource to extend the reach of your research to an even greater audience.

1 Examples of Scientific Illustrations in Practice

In the next several pages, you will find specific examples of published scientific illustrations. By transcribing the essence of the research into an illustration, it becomes possible to convey results simply and with minimal words. Compare the illustrations to the figures taken from the research papers. The section “Basic Illustrations” will explore examples from a variety of research fields, and the section "Advanced Illustrations" gives examples of cover art for scientific journals, and manga to explain complex concepts.

Basic Illustrations

Life science

Research Results

Researchers succeeded in real-time imaging of endocytosis by using a newly-developed high-speed scanning probe microscope.

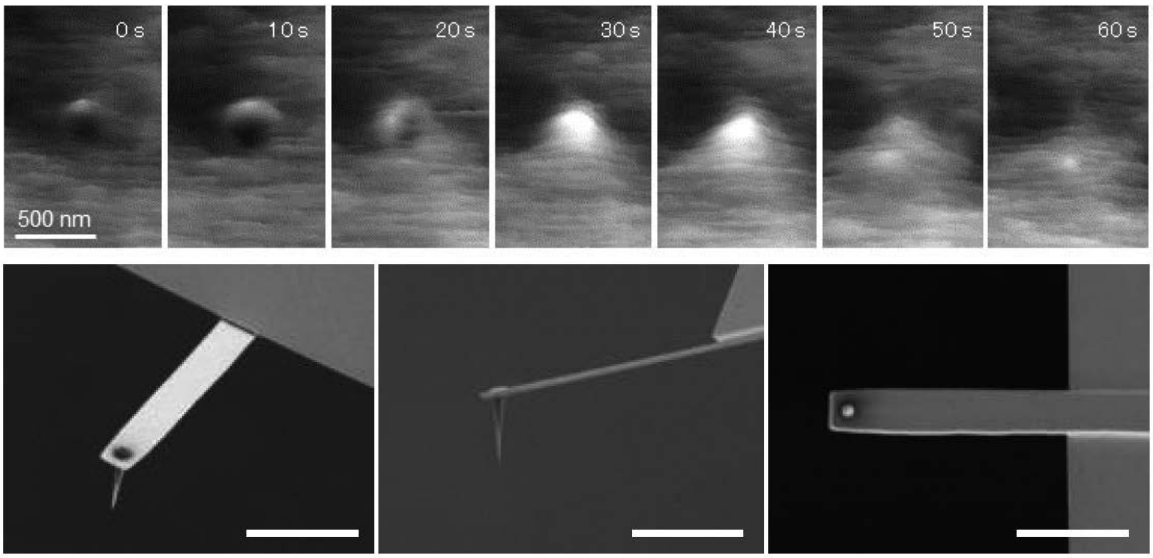
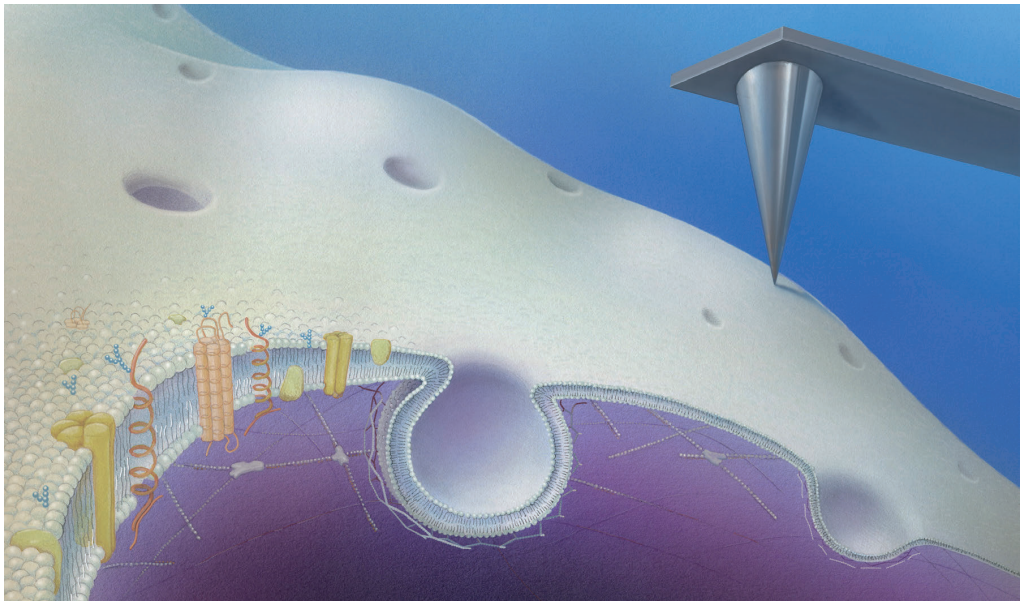


Figure 1

Images of endocytosis (above) and the probe microscope (below) published in the paper.

Illustration from the press release



(Credit: S. Yoshimura, Kyoto University / Art: TomoNarashima)

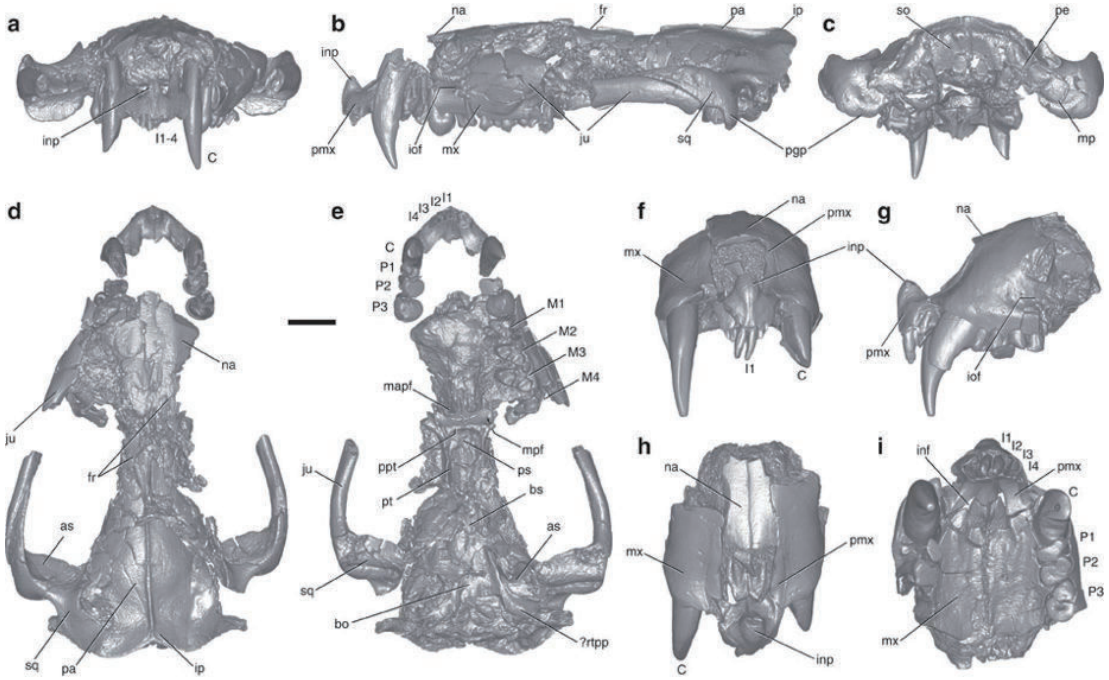
POINT

The illustration provides a clear image of the angle at which the probe contacts the surface of the cell membrane. The process of endocytosis is drawn accurately and in a way that makes it easy to understand the scientific concept. This drawing provides a clear image of endocytosis and the technology behind the microscope to readers unfamiliar with either.

Figure 2

Research Results

Researchers analyzed the fossilized head of a Late Cretaceous metatherian Didelphodon vorax discovered in the Hell Creek Formation in the central United States in 2012. Through this analysis, researchers successfully identified the creature's lifestyle and phylogenetic distribution.



Fossil microscans from the research paper.

Figure 3

Illustration used in a news article

Figure 4

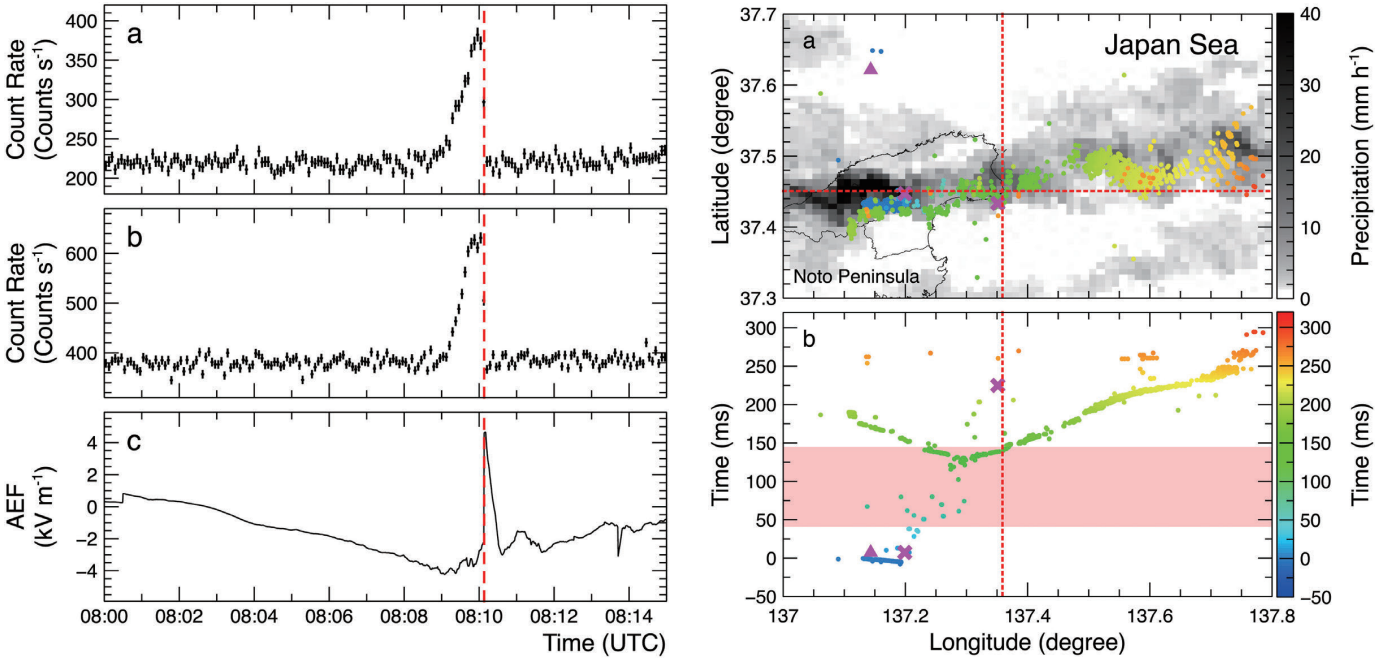
(Credit : Misaki Ouchida)

POINT

Based on the fossil interpretation, the artist has drawn a transparent view of the animal's head, depicting the muscles of the neck area to vividly illustrate the strength of the bite that characterizes this animal's predatory style.

Research Results

Researchers find that the gamma ray burst (a temporary increase in the emission of gamma rays) that occur when thunderclouds pass by is interrupted by lightning.



Graphs from the research paper showing the disruption of gamma ray bursts.

Figure 5

Illustration from the press release

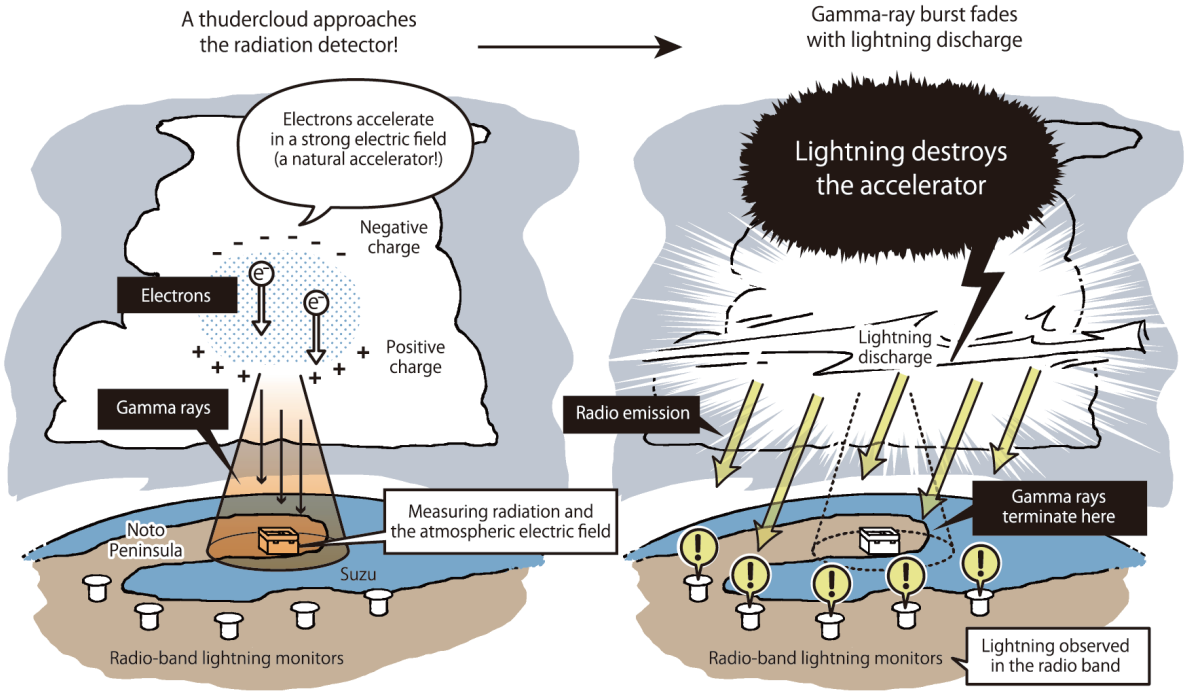


Figure 6

Wada et al., "Termination of Electron Acceleration in Thundercloud by Intra/Inter-cloud Discharge", *Geophys. Res. Lett.* (2018)
Illustration by Hayanon's Science Manga Studio

(Credit: Hayanon's Science Manga Studio)

POINT

The illustration presents in one drawing a clear explanation of the research, including the phenomenon and the research methods used.

Research Results

Researchers succeeded in aligning the direction of blue laser light and fluorescence emission directions using a "nano antenna" (a metal nanocylinder array) to develop a next-generation white light source with high fluorescence intensity.

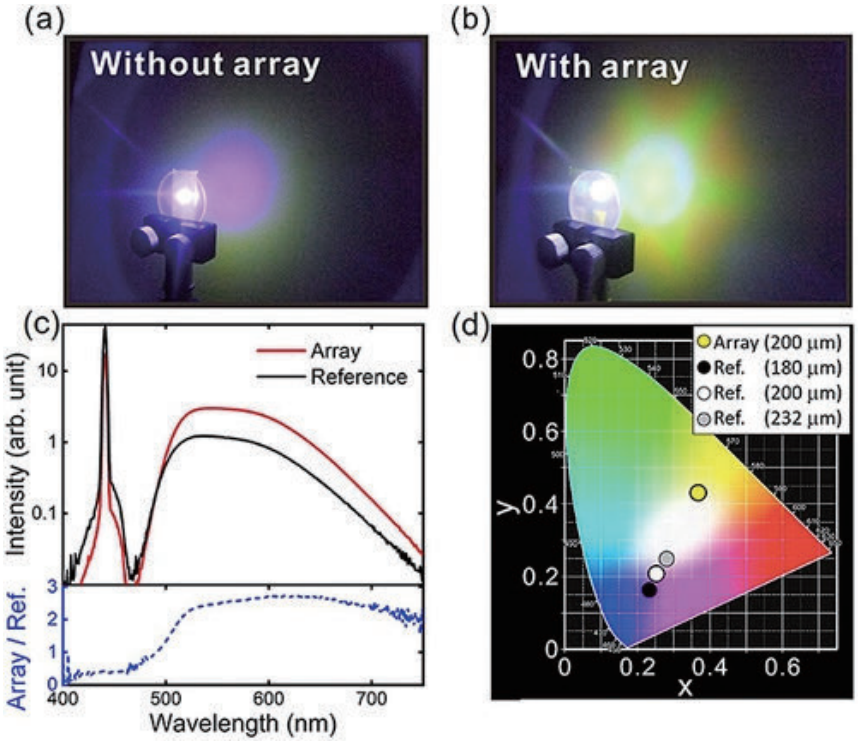


Figure 7

Photos and graphs from the paper depicting the effect of the nano-antenna.

Illustration from the press release

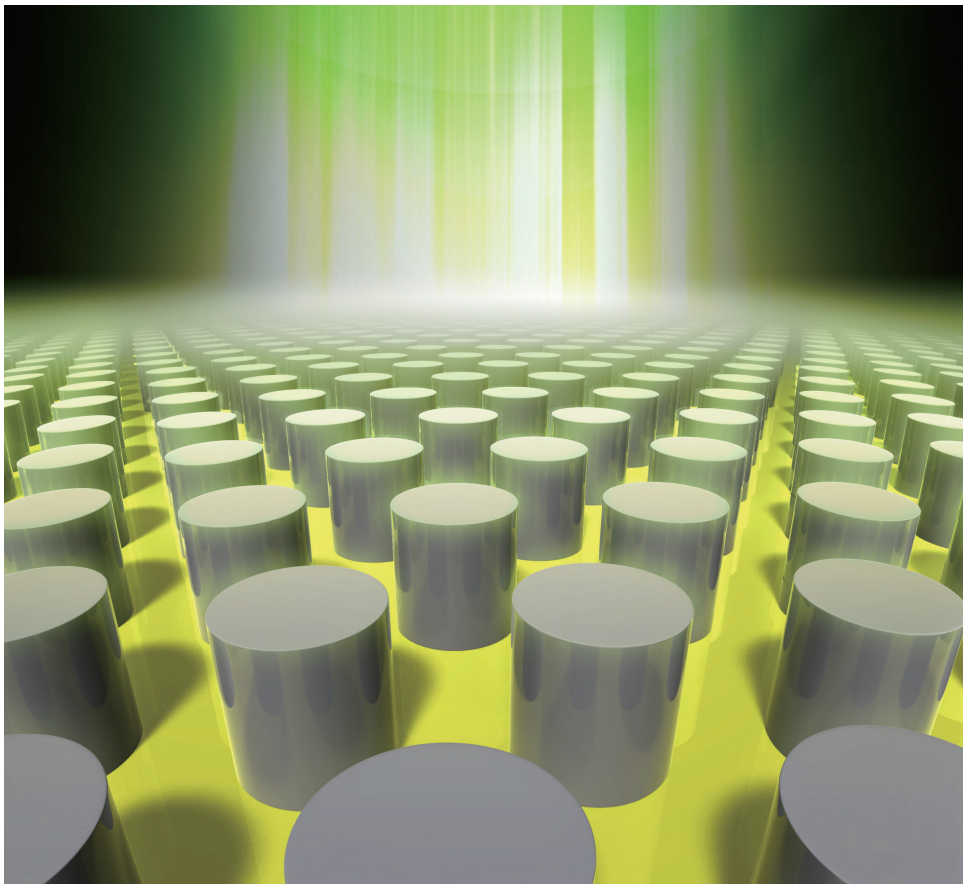


Figure 8

(Credit: Science Graphics. Co., Ltd.)

POINT

The "nano-antenna" constructed on the fluorescent surface aligning the direction of the light emissions. The illustration makes it easy for readers to visualize and understand what is happening at the nanometer scale.

Research Results

Researchers discover a supernova that produced a gamma-ray burst, accompanied by an ultra-high-speed "cocoon" component traveling at speeds up to 30% the speed of light.

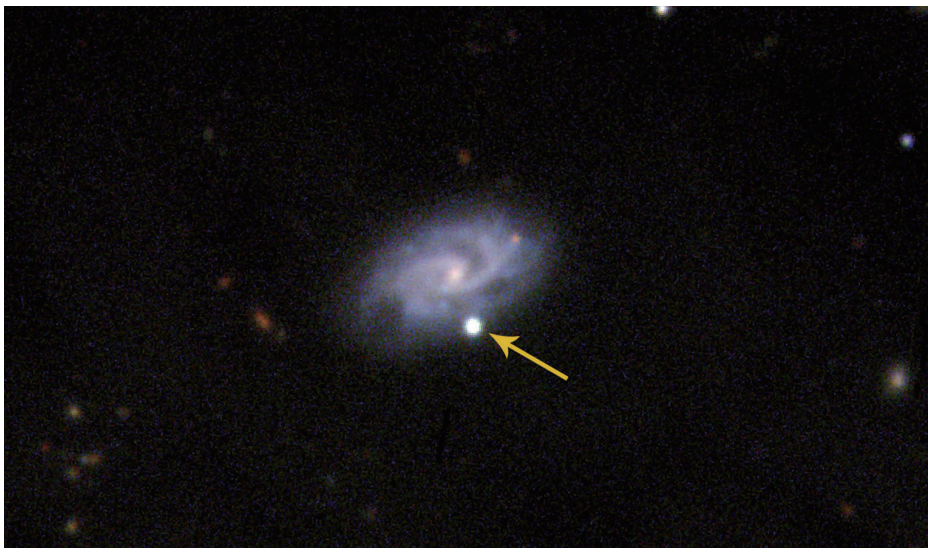


Figure 9
An image from the research paper based on observation and photographs (the arrow indicates the supernova)

Illustration from the press release

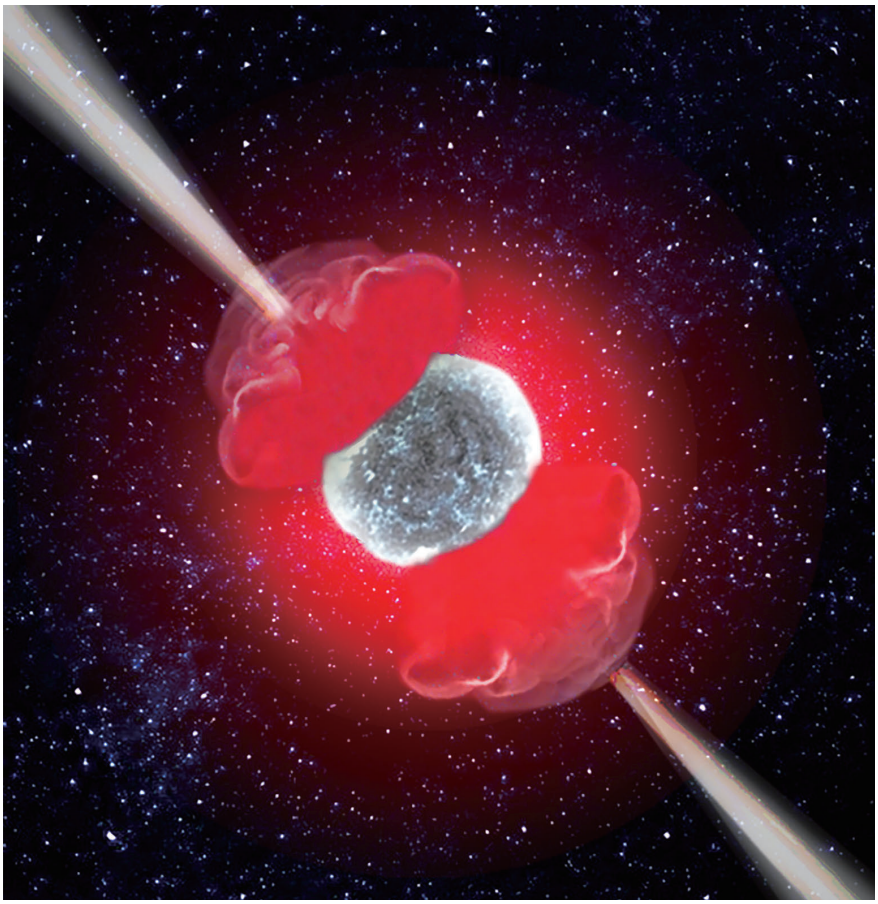


Figure 10
(Credit: Anna Serena Esposito)

POINT The illustration provides readers with an idea of the astronomical phenomenon this supernova entails.

Research Results

Researchers report that consuming green tea polyphenol can prevent the enlargement of abdominal aortic aneurysms.

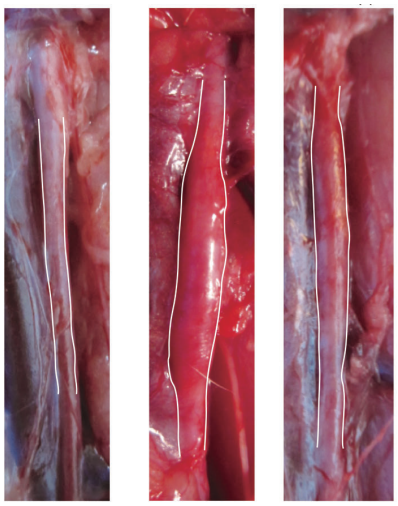


Figure 11
Dissection of a rat's abdominal aorta

Illustration from the press release

Figure 12
(Credit : Robin Hoshino)

POINT

Graphic photos like dissections may turn off general readers. An alternative illustration provides a softer image of a gory event while still conveying the main findings.

The use of manga as a means to effectively engage readers with research results is becoming more common. Please see the examples below.

Research Results

By developing a new method to produce high quality semiconductor film with a high degree of uniformity, researchers created a technique to manufacture perovskite solar cells that are easily reproducible and have high energy efficiency.

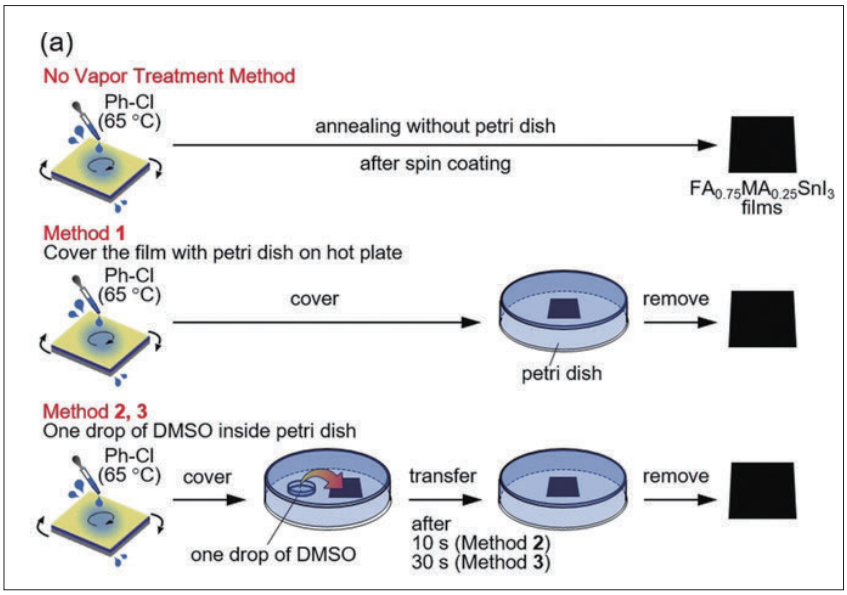


Figure 13

Figure from the research paper

Manga from the press release

Figure 14

(Credit : Hayanon's Science Manga Studio)

POINT

Manga harnesses the unique qualities of the art style to explain the scientific phenomenon and the research results. Additionally, presenting the research in manga form can spark a greater interest in reading the scientific material.

As with books and magazines, you will often see colorful illustrations and bold compositions to draw readers' attention on the covers of academic journals. Finding your work on the cover is one of the best ways to catch a reader's interest.

Research Results

Researchers determined that physical turbulence generated in the bone marrow and blood vessels is key to platelet production and used this new information to produce large quantities of high-quality platelets.

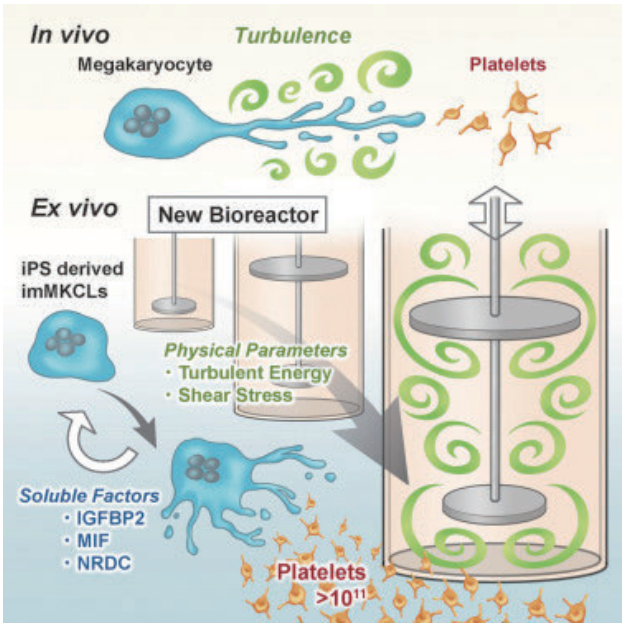
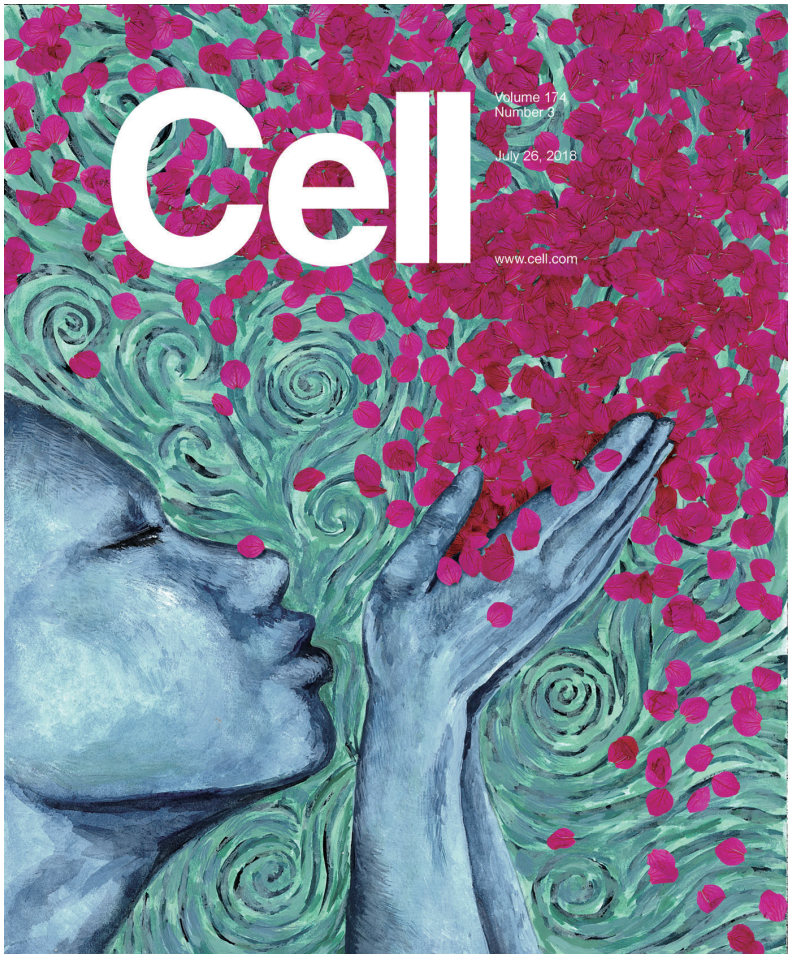


Figure 15

The graphical abstract of the research paper.

A rough design of a girl blowing on flower petals, inspired by the content of the research.

The illustration published on the cover of Cell



(Credit : Misaki Ouchida)

The idea grew from a pink evening primrose blooming close to Kyoto University.

POINT

In this illustration, the woman represents a megakaryocyte, the flower petals fluttering away represent platelets, and the blue swirls represent the turbulent background. The finished work artfully shows how turbulence induces a megakaryocyte to release platelets.

Figure 16

❷ How to commission a scientific illustrator

Ordering and production process

01 Choose an illustrator

Selecting the right illustrator is very important, because different illustrators have different styles and strengths in different research fields.
(Please see Section 3 “List of Illustrators" in this booklet)

02 Make an inquiry and order

The following points should be discussed.

- Purpose of the illustration (press release, website, etc.)
- Price
- Production schedule/submission deadline
- Size (be sure to order in a size suitable for printing if you plan to print the illustration)
- Handling of copyright

03 Meet the Illustrator

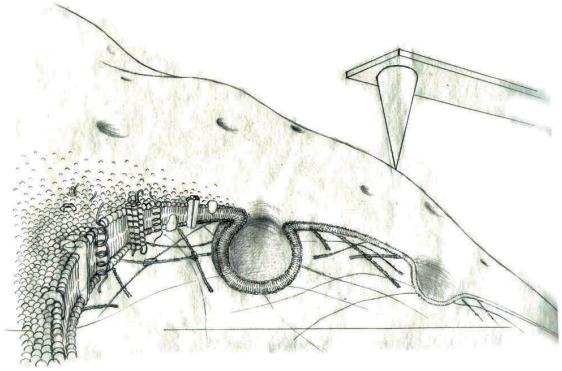
Meetings with the illustrator are encouraged. At the meetings, be prepared to provide and receive

- The research manuscript, academic conference documents, charts/diagrams, photos, videos, references, etc.
- Research outline (a copy of the press release is recommended)
- A proposal by the illustrator

Conduct meetings in person or correspond via email or video chat

04 Rough Sketch

Creation of Final Piece :
It is important to request modifications at the rough sketch stage because large changes once production of the final illustration has begun are difficult, and add to cost and delays.



Example of a completed rough sketch
(Illustration: Tomoyuki Narashima)

05 Submission & Payment

Key points to remember when making an order

Time Until Submission

There will be a series of meetings and edits before the final illustration is completed. An illustration takes time after the first meeting, so we encourage researchers to start considering visuals early, even before your paper is accepted.

Fees

Because scientific illustrations are made-to-order, production fees will vary depending on the size, detail, colors, difficulty, etc. Be sure to thoroughly consult with the illustrator about whether your desired illustration can be completed within your budget before making an order. Production costs are generally covered under public outreach funds, such as Kakenhi. Check with administrative staff to see if you can use public funding for illustration production and with the illustrator to confirm if they accept payment from public funds.

Copyright

Illustrators retain copyrights, so negotiate usage

Copyright is generally attributed to the illustrator. Researchers are permitted to use scientific illustrations within the limits of a pre-determined range. As a result, except in certain instances — such as personal use — you will not be permitted to copy illustrations, publish them elsewhere, sell them, transfer their rights, or modify them without the illustrator's permission. To avoid issues with copyright, be sure to carefully consult with the illustrator about copyright attribution, range of use, credit notation, and so on before finalizing your order and signing a contract. When you do sign a contract, it is good practice to exchange written confirmation detailing the terms agreed upon. For detailed information about copyright, please refer to the Agency for Cultural Affairs website. (http://www.bunka.go.jp/seisaku/chosakuken/)

❸ List of Illustrators

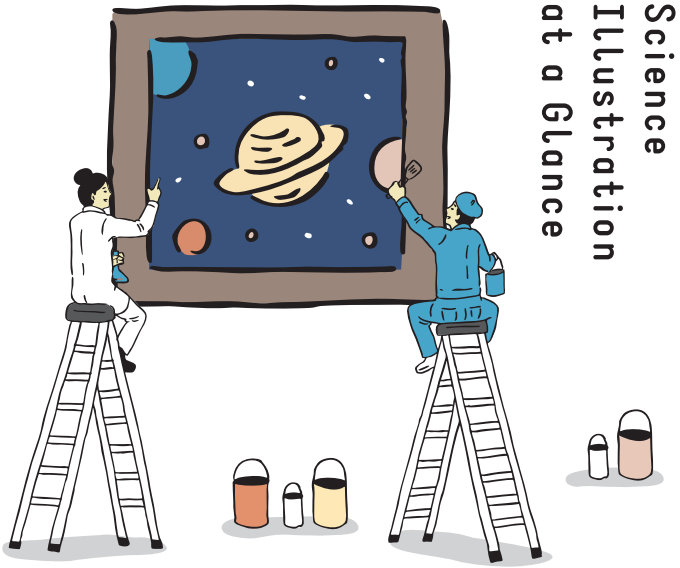
The following is a list of selected illustrators and production companies. We have included artwork samples and approximate prices and production times. The Office of Global Communications can assist in selecting an illustrator who best suits your purpose and nature of your research. Please do not hesitate to contact us.

- Submission times and prices listed are typical for the production of illustrations used in press releases.

A5-sized color illustration for press releases

- All listed prices do not include taxes.
- Please keep in mind that listed submission times and prices are only rough estimates and are liable to change depending on the commission.
- Please inquire with each respective illustrator or production company for prices and submission times.
- Additional administrative fees may apply.
- The illustrations printed are examples of the listed illustrator or production company. Please note, some examples may not represent the standard A5-sized color illustration

*Listed alphabetically by name

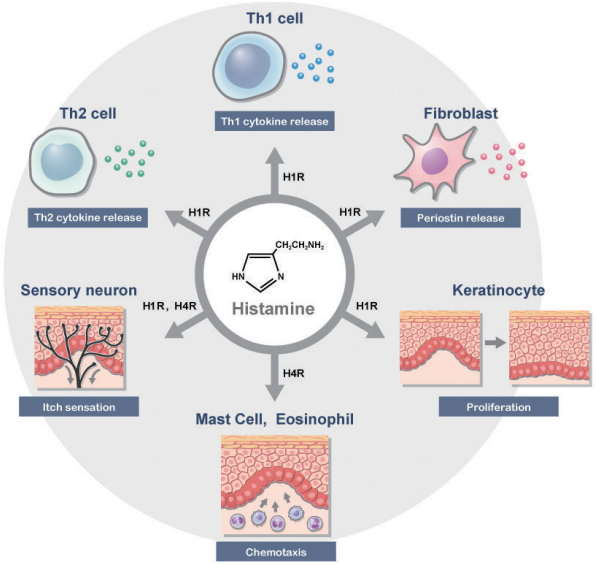


Kana Ariga

(Communication Design Director, LAIMAN Corporation and Assistant Professor, Cyclotron and Radioisotope Center, Tohoku University)

A researcher of visual cultures of science, Ariga also designs illustrations in the life sciences. She has served as a JSPS researcher, and as a URA at Tohoku University. Through her work as an administrator of the website “Kagakudo”, Ariga is promoting the use of scientific illustrations in Japan.

Submission Time : Approx. 2 weeks – 1.5 month*
Price : Approx. 30,000 - 100,000 yen*
Website : http://www.kana-science.sakura.ne.jp
Email : birds.kana@gmail.com
English? : Email only



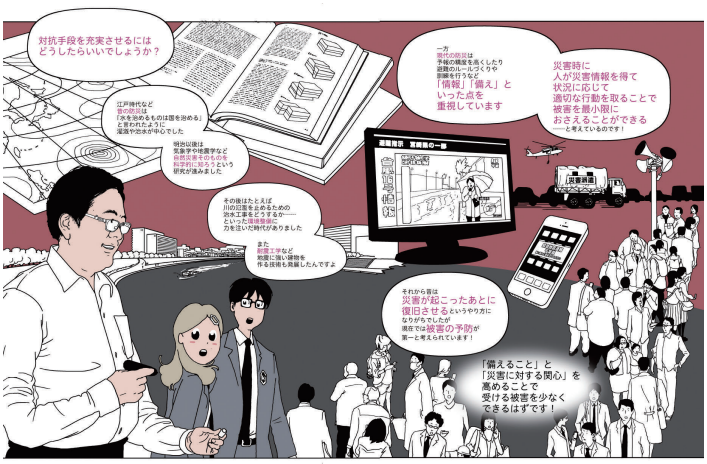
(Illustration : Kana Ariga)

Note: Cost and delivery are based on a colored A5-sized illustration commonly found on press releases, and are subject to change if illustration conditions differ. The following works are representative examples to help readers grasp the characteristics of each illustrator/production company, and may not reflect exact delivery dates and costs. Please also note that English ability among the vendors may vary.

Hayanon's Science Manga Studio

Hayanon is a manga comic artist specializing in the fields of science, engineering, and English education. Since 1999, she has been producing works for educational and research institutions, private industries, and government offices. In recent years, she has worked on manga for academic public relations in both English and Japanese, with attention to different expressions for different cultures. Her past works have been used by Kyoto University, the University of Tokyo, Osaka University, Tohoku University, Hokkaido University, NASA, and many others.

Submission Time : 2 weeks*
Price : 50,000 yen -*
Website : http://www.hayanon.jp/
Email : hayanon@hayanon.jp
English? : Yes



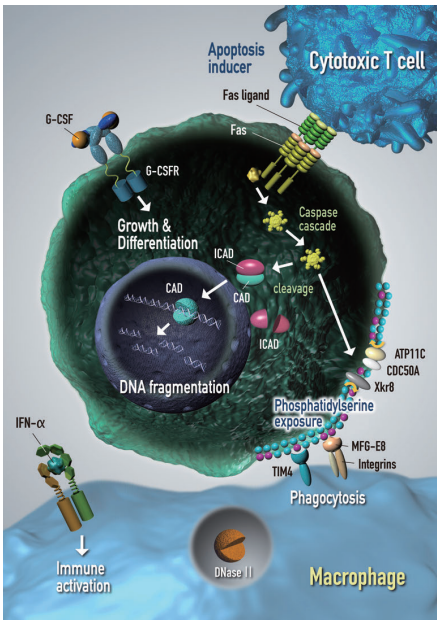
(Illustration : Hayanon's Science Manga Studio)

Haruko Hirukawa

(National Institute of Informatics)

Hirukawa studied media arts at Joshibi University of Art and Design, majored in biology at Utsunomiya University and the University of Tokyo Graduate School of Frontier Sciences, and earned an associate degree in science illustration at California State University, Monterey Bay. She worked as a science designer and illustrator at the Nagoya University Institute of Transformative Bio-Molecules (ITbM), and, since 2017, has been studying as a graduate student at the National Institute of Informatics while freelancing as an illustrator. Specializes in 3DCG of cells and molecules along with their activity.

Submission Time : Approx. 2–3 weeks*
Price : Approx. 50,000 – 80,000 yen*
Website : http://haru.co/
Email : hirukawa@nii.ac.jp
English? : Yes



(Illustration : Haruko Hirukawa)

Robin Hoshino

Robin Hoshino is an illustrator working mainly in Kyoto. Her illustrations have gained popularity across a variety of genres both in Japan and overseas for their colorful style. She has provided illustrations for press releases from Kyoto University since 2017 (including the Graduate School of Education and the Graduate School of Medicine), successfully conveying the essence of the research in a format that is easy for the reader to understand.

Submission Time : 2 weeks*
Price : 25,000 yen – 50,000 yen*
Website : http://www.hoshinorobin.com/
Email : hello@hoshinorobin.com
English? : Yes

(Illustration :Robin Hoshino)

Note: Cost and delivery are based on a colored A5-sized illustration commonly found on press releases, and are subject to change if illustration conditions differ. The following works are representative examples to help readers grasp the characteristics of each illustrator/production company, and may not reflect exact delivery dates and costs. Please also note that English ability among the vendors may vary.

Yoh Izumori

After graduating from Shinshu University's Faculty of Science with a focus in biology, Izumori went on to work at a publishing company, and in 2004 began working as a freelance illustrator, focusing mainly on the theme of living creatures. Using his scientific knowledge as the basis for the drawings, he has produced many illustrations for a range of products, from children's books to technical texts and academic posters.

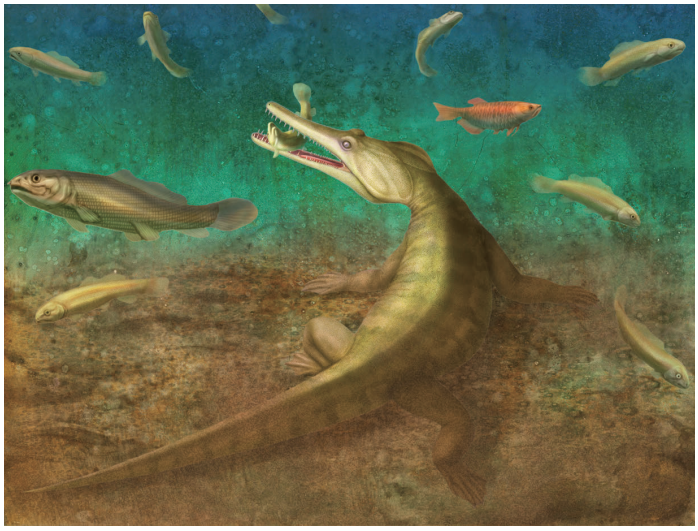
Submission Time : 1 month*
Price : 50,000 – 70,000 yen*
Website : https://yohizumori.jimdo.com/
Email : yizumori@gmail.com
English? : Email only

(Illustration : Yoh Izumori)

Utako Kikutani

Kikutani left a doctorate program in zoology at the University of Tokyo's Graduate School of Science to enter the University of California Santa Cruz with a major in science illustration. After interning at the American Museum of Natural History, she began working in New York. Since returning to Japan in 2001, Kikutani has produced many scientific illustrations of animals -- both living and extinct -- for textbooks, children's books, and museum exhibitions.

Submission Time : 2 weeks or more*
Price : 50,000 – 200,000 yen*
Website : http://www.utakokikutani.com/
*Contact via website
English? : Yes



(Illustration :Utako Kikutani)

Chihiro Kinoshita

(Atmosphere and Ocean Research Institute, The University of Tokyo)

Chihiro Kinoshita has a Ph.D in Biology. Much of her work is in creating explanatory illustrations for scientific papers in the fields of biology and ecology. She has provided illustrations for academic journals, such as the Journal of Experimental Biology. Kinoshita's illustrations have also been featured in children's books, technical books, and academic posters.

Submission Time : 2 weeks – 1 month*
Price : 40,000 – 100,000 yen*
Website : @chimomonga (Twitter account)
Email : chichiro.kinoshita@gmail.com
English? : Email only

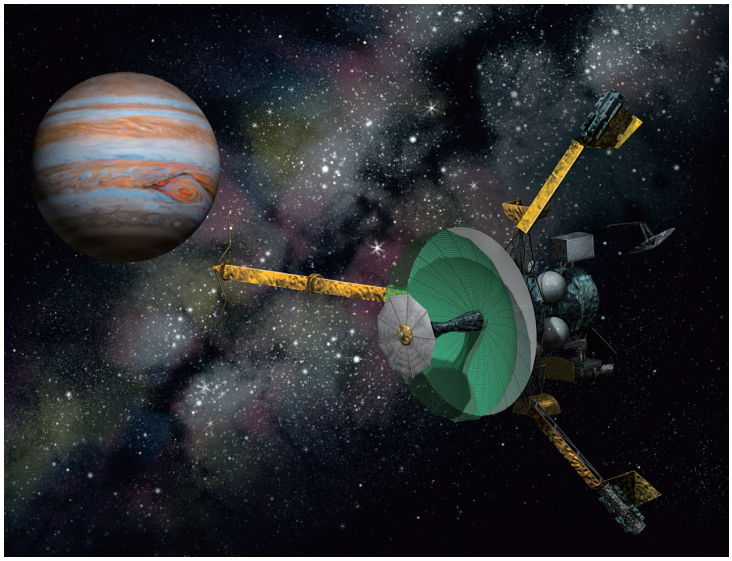
(Illustration : Chihiro Kinoshita)

Note: Cost and delivery are based on a colored A5-sized illustration commonly found on press releases, and are subject to change if illustration conditions differ. The following works are representative examples to help readers grasp the characteristics of each illustrator/production company, and may not reflect exact delivery dates and costs. Please also note that English ability among the vendors may vary.

Shinichiro Kinoshita

Kinoshita has produced many illustrations of space, the human body, the environment, etc. for the monthly science magazine "Newton," and "Newton Special Edition,". His works can also be found in other publications, including illustrated reference books, picture books, and textbooks. The design office is located in Chiba Prefecture.

Submission Time : 1 week – 1 month*
Price : 30,000 – 100,000 yen*
Website : https://kinoshita-design.com/
Email : info@kinoshita-design.com
English? : No

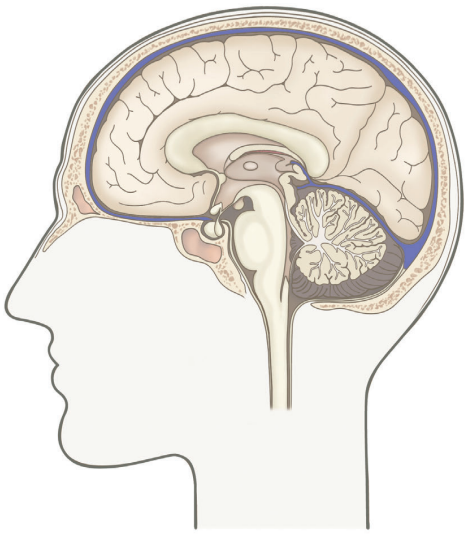


(Illustration : Shinichiro Kinoshita)

LAIMAN / tokco

This visual content production company specializes in medical illustrations. Its president, tokco (tokuko), is a science/medical illustrator and certified veterinarian. In addition to providing medically accurate illustrations to universities, medical institutions, and specialized journals across Japan, LAIMAN tokco also produces animation. The company has a dedicated legal consultant to help researchers navigate copyright issues and assist artists in protecting intellectual property.

Submission Time : 2–3 weeks*
Price : 15,000 yen – 80,000 yen*
Website : https://www.laiman.co.jp/
Email : noriko@laiman.co.jp
English? : Yes + Chinese



(Illustration : LAIMAN / tokco)

Tomoyuki Narashima

Narashima has worked at the forefront of scientific illustration in the U.S. for over 30 years, and now has moved to Kyoto! In addition to being featured in many textbooks such as Human Physiology, Narashima's work can be found on the cover of Science and numerous other academic journals. He has also produced illustrations for many Japanese universities and research institutions, from textbooks to illustrated research guides and scientific journals, including the "Stem Cell Handbook" of Kyoto University's Center for iPS Cell Research and Application.

Submission Time : 1–2 weeks*
Price : 50,000 yen*
Email : tomo.tane1@gmail.com
English? : Yes

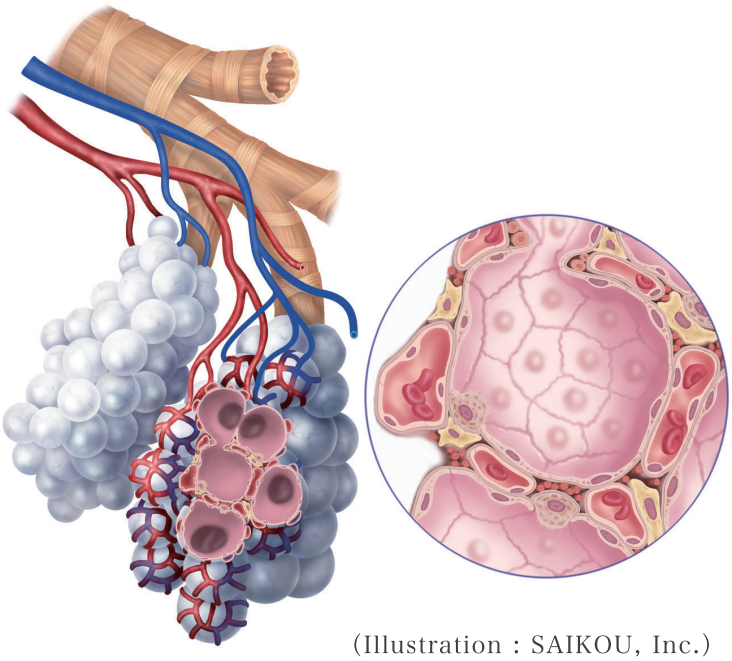
(Illustration : Tomoyuki Narashima)

Note: Cost and delivery are based on a colored A5-sized illustration commonly found on press releases, and are subject to change if illustration conditions differ. The following works are representative examples to help readers grasp the characteristics of each illustrator/production company, and may not reflect exact delivery dates and costs. Please also note that English ability among the vendors may vary.

SAIKOU, Inc.

This design company provides illustrations with a focus on the fields of medicine and biology. The president, Yoshitaka Sato, has been working as a medical illustrator since the company's founding in 1990. SAIKOU, Inc. provides high quality scientific illustrations, from those that require the lightest touch to the most minute details. They have provided illustrated works to the medical departments of universities nationwide as well as to many medical institutions and publishing companies.

Submission Time : 2–3 weeks*
Price : 30,000 – 60,000 yen*
Website : https://www.saikou-i.co.jp/
Email : info@saikou-i.co.jp
English? : Yes

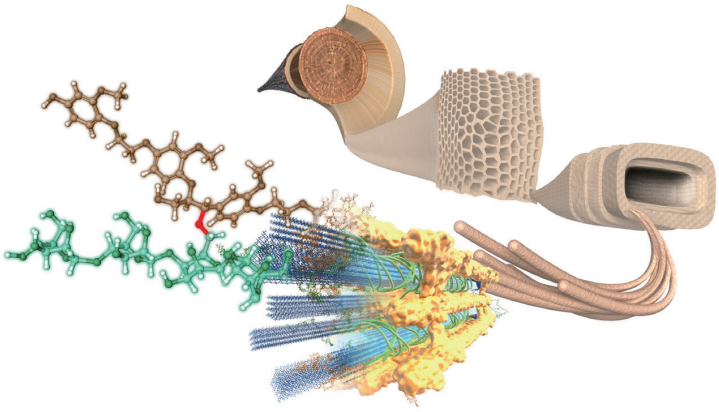


(Illustration : SAIKOU, Inc.)

Science Graphics. Co., Ltd.

Headquartered near Kyoto University, president Takashi Tsujino founded Science Graphics after working as a scientific illustrator and writer when he studied at Kyoto University. Science Graphics offers a wide range of visual production services, from illustration to 3D graphics and animation. They have produced works for Kyoto University's Institute for Integrated Cell-Material Sciences (iCeMS).

Submission Time : Approx. 1 week*
Price : 40,000 – 50,000 yen*
Website : https://www.s-graphics.co.jp/
English? : Yes



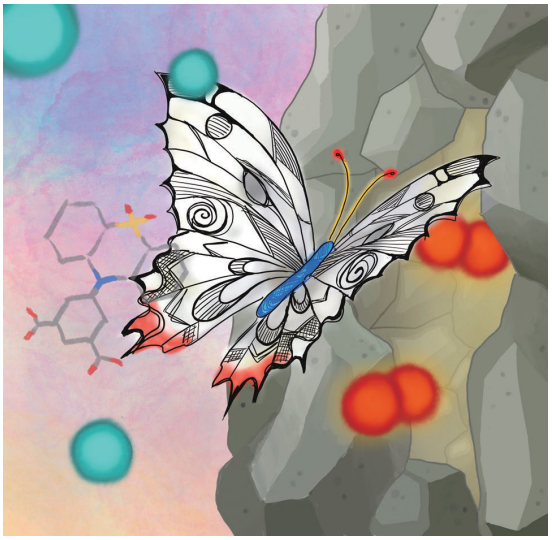
(Illustration : Science Graphics. Co., Ltd.)

Mindy Takamiya

(Kyoto University Institute for Integrated Cell-Material Sciences (iCeMS))

Takamiya conducts research public relations at iCeMS and also is an illustrator/graphic designer. Her style is characterized by colors and flair that are attractive to people not familiar with scientific research. Besides science illustrations, she produces general art, poster layouts, and logos.

Submission Time : 1 week – 1 month*
Price : Approx. 50,000 – 100,000 yen*
Website : https://mindytakamiya.com
Email : mindytakamiya@gmail.com
English? : Yes



(Illustration :Mindy Takamiya)

Note: Cost and delivery are based on a colored A5-sized illustration commonly found on press releases, and are subject to change if illustration conditions differ. The following works are representative examples to help readers grasp the characteristics of each illustrator/production company, and may not reflect exact delivery dates and costs. Please also note that English ability among the vendors may vary.

Ryunosuke Takeshige

Takeshige is an illustrator specializing in astronomy. He is known for creating detailed 3D computer graphics and has created many illustrations for the general public. Some of his credits include JAXA, the National Astronomical Observatory of Japan, Kyoto University, the University of Tokyo, and the Yale University Press.

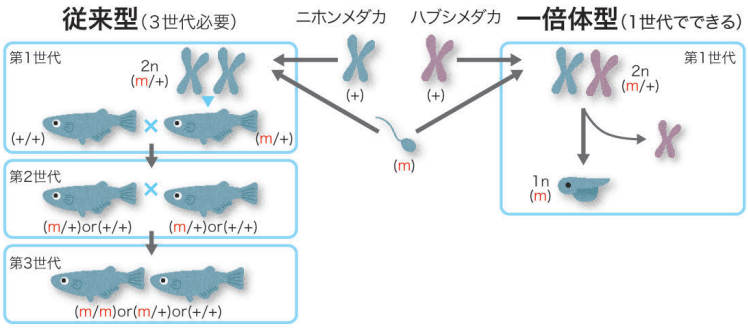
Submission Time : 2 weeks – 2 months*
Price : 120,000 – 180,000 yen*
Website : https://www.artstation.com/A4sizeCG
Email : a4size.3dcg@gmail.com
English? : Email only

(Illustration : Ryunosuke Takeshige)

TRAIS.Co., Ltd.

TRAIS is a Kobe-based design, website production, and printing company. Their past works include designs for university and academic brochures, pamphlets, posters, and websites. They also design the cover illustrations and pamphlets for Kyoto University's English-language PR publication, "Kyoto U Research News."

Submission Time : 2 weeks (One revision)*
Price : 35,000 yen*
Website : https://trais.co.jp/
Email : info@trais.co.jp
English? : No

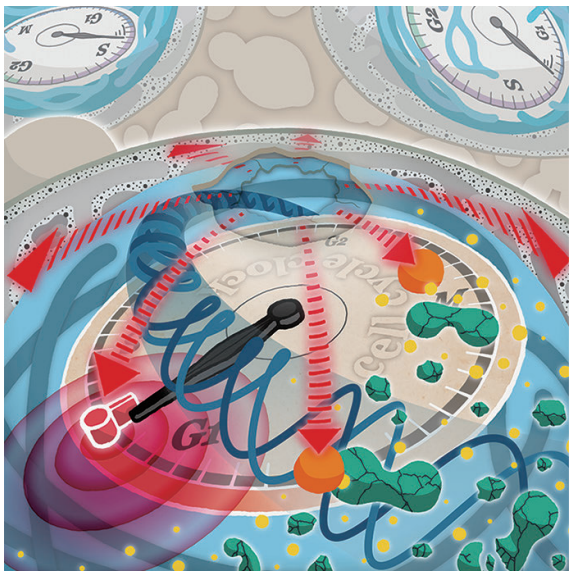


(Illustration : TRAIS.Co., Ltd.)

Hiroko Uchida

Uchida studied the life sciences at Nara Women's University. Her illustrations are characterized by the use of many bright colors. Uchida is recognized for her illustrations of cells and molecules, and has appeared in academic journals such as "Molecular Cell", in school textbooks, and in academic posters.

Website : http://uchidahiroko.com/
Email : me@uchidahiroko.com
English? : Email only



(Illustration : Hiroko Uchida)

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Useful websites

Kagakudo

http://www.kana-science.sakura.ne.jp/

This website is run by Kana Ariga, a science communication and visual science researcher as well as a scientific illustrator. The website includes an outline of the field and a wide variety of detailed information about the history of scientific illustration, the production process, copyright information, and more.

Japanese Society for Science Visualization

http://www.geijutsu.tsukuba.ac.jp/jssv/index.html

This research society aims to improve the current state of science visualization in Japan, which is lagging behind when compared with the West. It also promotes communication between researchers and illustrators, creating opportunities for the exchange of information and collaborative work between the them. The Japanese Society for Science Visualization operates across Japan, but particularly at the University of Tsukuba.

Inquiries about illustration production

Kyoto University Office of Global Communications

TEL 075-753-5729 FAX 075-753-2094

E-mail：comms@mail2.adm.kyoto-u.ac.jp

*The Office of Global Communications manages all research PR for the university. It also accepts inquiries about press releases and press conferences.

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References for illustrations

1 A. Yoshida, et al., “Morphological changes of plasma membrane and protein assembly during clathrin-mediated endocytosis,” PLOS Biology, 2018, DOI: org/10.1371/journal.pbio.2004786

2 Credit: S. Yoshimura, Kyoto University.
Art: Tomo Narashima. Research information: http://www.kyoto-u.ac.jp/ja/research/research_results/2018/180503_3.html (Japanese)

3 G.Wilson, et al., “A large carnivorous mammal from the Late Cretaceous and the North American origin of marsupials,” Nature Communications, 2018, DOI: 10.1038/ncomms13734

4 Illustration of Didelphodon, a marsupial relative from the Late Cretaceous with the strongest pound-for-pound bite force of any known mammal. Credit: Misaki Ouchida.
Research information: “Mammals during Age of Dinosaurs packed a powerful bite,” The Burke Museum, 2016, https://www.burkemuseum.org/blog/mammals-during-age-dinosaurs-packed-powerful-bite

5 Y. Wada et al., “Termination of Electron Acceleration in Thundercloud by Intra/Inter-cloud Discharge,” Geophysical Research Letters, 2018, DOI:10.1029/2018GL077784

6 Credit: Hayanon’s Science Manga Studio. Research Informatinon:http://www.kyoto-u.ac.jp/ja/research/research_results/2018/180517_2.html (Japanese)

7 R. Kamakura et al., “Enhanced photoluminescence and directional white-light generation by plasmonic array,” Journal of Applied Physics, 2018, DOI:10.1063/1.5050993

8 Credit: Science Graphics. Co., Ltd. Research Information: http://www.kyoto-u.ac.jp/ja/research/research_results/2018/181206_1.html (Japanese)

9 Credit: Antonio de Ugarte Postigo, Instituto de Astrofísica de Andalucía (IAA-CSIC)

10 Illustration of gamma-ray burst with a jet cocoon (red). Credit: Anna Serena Esposito. Research information: http://www.kyoto-u.ac.jp/ja/research/research_results/2018/190117_1.html (Japanese)

11 Credit: Shuji Setozaki, Kenji Minakata and Hidetoshi Masumoto. Research paper: S. Setozaki, et al., “Prevention of abdominal aortic aneurysm progression by oral administration of green tea polyphenol in a rat model,” Journal of Vascular Surgery, 2016, DOI: 10.1016/j.jvs.2016.06.003

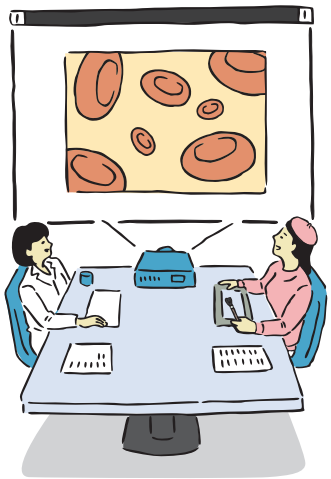
12 Credit: Robin Hoshino. Research information: http://www.kyoto-u.ac.jp/cutting-edge/cutting_edge/page96.html

13 Liu, J. et al., “Lead-Free Solar Cells based on Tin Halide Perovskite Films with High Coverage and Improved Aggregation,” Angewandte Chemie International Edition, 2018, DOI:10.1002/anie.201808385

14 Credit: Hayanon’s Science Manga Studio. Research information: http://www.kyoto-u.ac.jp/ja/research/research_results/2018/180905_1.html (Japanese)

15 Y. Ito et al., “Turbulence Activates Platelet Biogenesis to Enable Clinical Scale Ex Vivo Production,” Cell, 2018, DOI:10.1016/j.cell.2018.06.01, Credit: Misaki Ouchida

16 Cover illustration for “Cell,” depicting platlets produced in the body as a result of blood flow turbulence. Credit: Misaki Ouchida. Making process: “Graphical Abstract and Cell Cover Art for iPSC-derived Platelet Project,” https://www.misakiouchida.com/copy-of-ciraintsym Research information:https://www.cira.kyoto-u.ac.jp/e/pressrelease/news/180713-090000.html



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A Handbook for Researchers

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