Disseminating our research
effectively and efficiently

Institute for the Advanced Study of Human Biology (WPI-ASHBi)
Kyoto University
Research Coordinator **Hiromi Nakao-Inoue**

About myself

Hiromi Nakao-Inoue M.S.

Research Coordinator, WPI-ASHBi

2006 Master of Science (Medical Science)

Technical Staff @ RIKEN

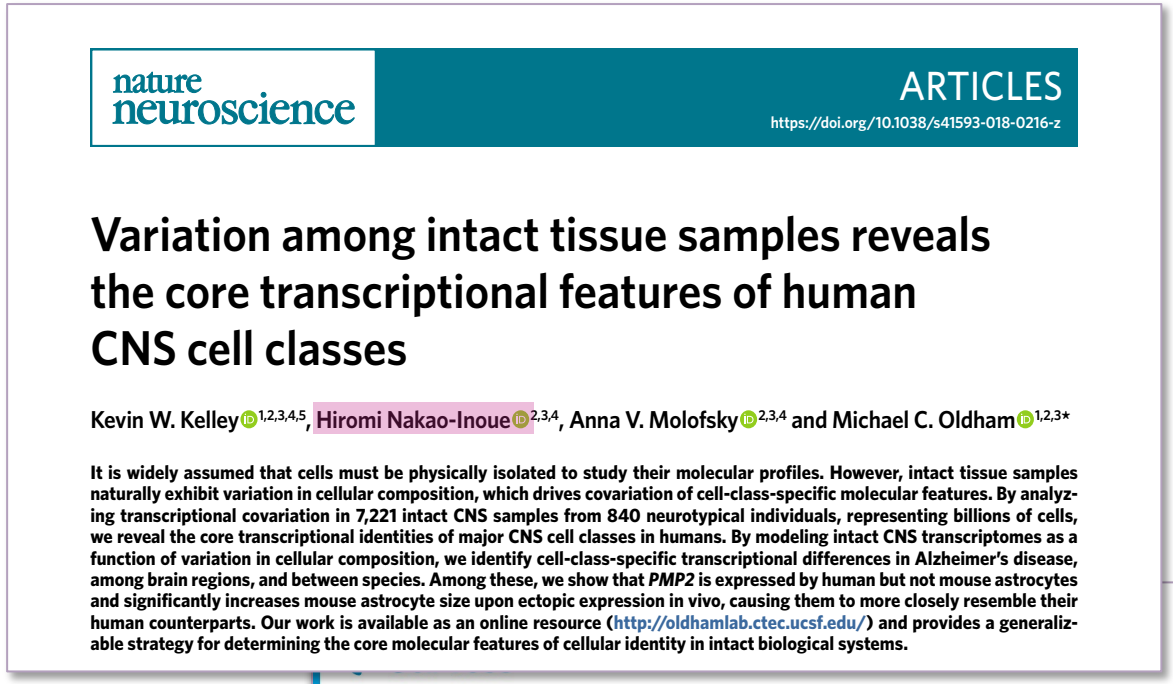
2012 Assistant Specialist @UCSF (Laboratory Medicine)

2015 Lab Manager @UCSF (Department of Psychiatry)

2020 Research Coordinator @ WPI-ASHBi, Kyoto University

Institutional program management, scientific visualization

2022 **+ News release**



nature neuroscience

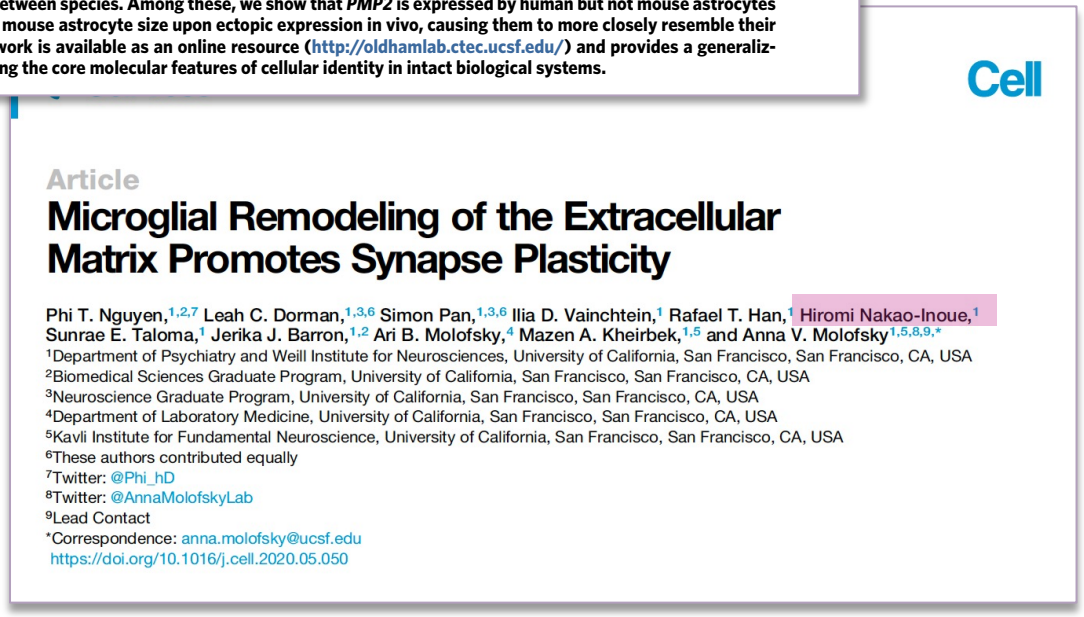
ARTICLES

https://doi.org/10.1038/s41593-018-0216-z

Variation among intact tissue samples reveals the core transcriptional features of human CNS cell classes

Kevin W. Kelley[1,2,3,4,5], Hiromi Nakao-Inoue[2,3,4], Anna V. Molofsky[2,3,4] and Michael C. Oldham[1,2,3*]

It is widely assumed that cells must be physically isolated to study their molecular profiles. However, intact tissue samples naturally exhibit variation in cellular composition, which drives covariation of cell-class-specific molecular features. By analyzing transcriptional covariation in 7,221 intact CNS samples from 840 neurotypical individuals, representing billions of cells, we reveal the core transcriptional identities of major CNS cell classes in humans. By modeling intact CNS transcriptomes as a function of variation in cellular composition, we identify cell-class-specific transcriptional differences in Alzheimer's disease, among brain regions, and between species. Among these, we show that *PMP2* is expressed by human but not mouse astrocytes and significantly increases mouse astrocyte size upon ectopic expression in vivo, causing them to more closely resemble their human counterparts. Our work is available as an online resource (http://oldhamlab.ctec.ucsf.edu/) and provides a generalizable strategy for determining the core molecular features of cellular identity in intact biological systems.



Cell

Article

Microglial Remodeling of the Extracellular Matrix Promotes Synapse Plasticity

Phi T. Nguyen,[1,2,7] Leah C. Dorman,[1,3,6] Simon Pan,[1,3,6] Ilia D. Vainchtein,[1] Rafael T. Han,[1] Hiromi Nakao-Inoue,[1] Sunrae E. Taloma,[1] Jerika J. Barron,[1,2] Ari B. Molofsky,[4] Mazen A. Kheirbek,[1,5] and Anna V. Molofsky[1,5,8,9,*]

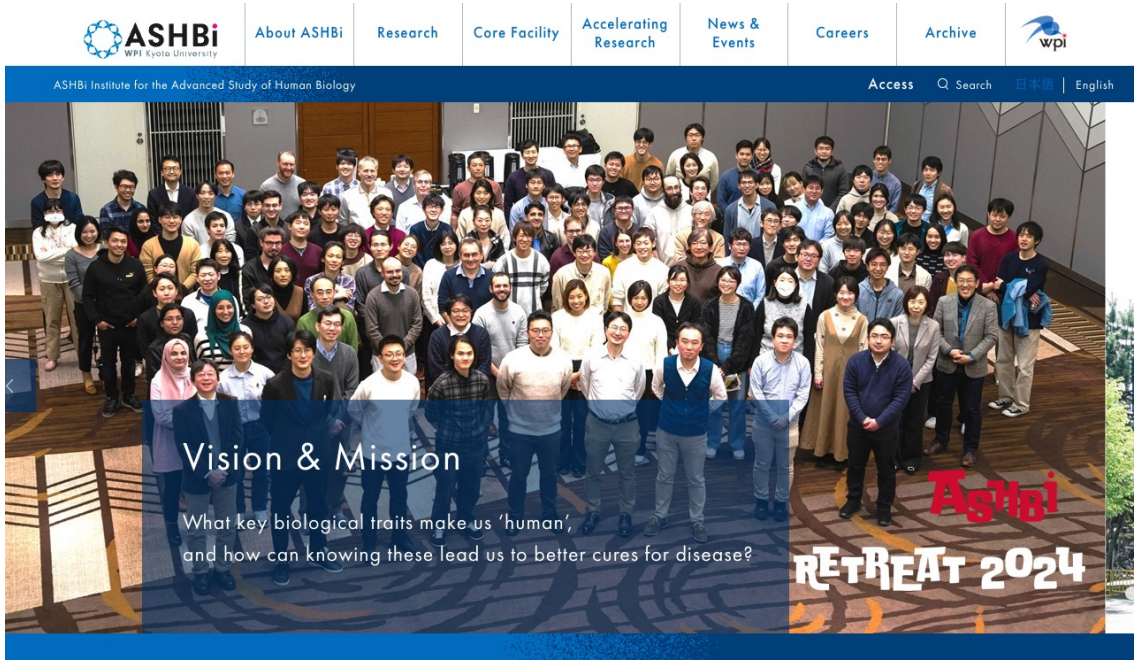
[1]Department of Psychiatry and Weill Institute for Neurosciences, University of California, San Francisco, San Francisco, CA, USA
[2]Biomedical Sciences Graduate Program, University of California, San Francisco, San Francisco, CA, USA
[3]Neuroscience Graduate Program, University of California, San Francisco, San Francisco, CA, USA
[4]Department of Laboratory Medicine, University of California, San Francisco, San Francisco, CA, USA
[5]Kavli Institute for Fundamental Neuroscience, University of California, San Francisco, San Francisco, CA, USA
[6]These authors contributed equally
[7]Twitter: @Phi_hD
[8]Twitter: @AnnaMolofskyLab
[9]Lead Contact
*Correspondence: anna.molofsky@ucsf.edu
https://doi.org/10.1016/j.cell.2020.05.050

Insutitute for the Advanced Study of Human Biology (WPI-ASHBi)

ASHBi was esatablished in October 2018 with funding from the World Premier International Research Center Initiative (WPI) Program of MEXT.

ASHBi's GOAL

What key biological traits make us 'human', and how can knowing these lead us to better cure for disease?



Research Group: **16**, Reseacher: **66**, Student: **91**

Research area
Developmental biology, Genome informatics, Primate model, Basic/Clinical Medicine
Mathematics, Bioethics

ASHBi website

@Ashbi_KyotoU

@ashbi2018

ASHBi's news release in EurekAlert!

EurekAlert!

FY2023 : Published **9** releases

Supported **3** releases as a joint news release

FY2024 : Published **2** releases (2 relases under construction)

Supported **1** release as a joint news release

Annually
10 release

News outlet
Avg. **7.3**
per release

ASHBi
Research Acceleration Unit

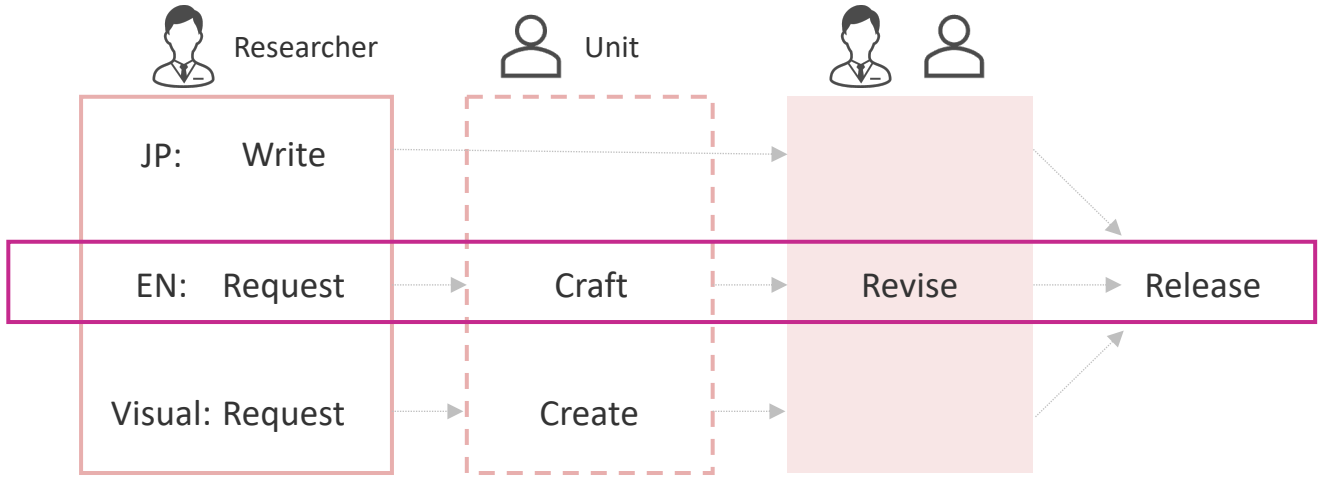
Research Coordinators

H. INOUE

C. CHIWATA

Two assigned staff for PR

News release
Crafting in ASHBi




EurekAlert!

NEWS RELEASE 4-JAN-2024

Lighting the circuits to risky decision-making

Researchers at Kyoto University identify and selectively manipulate the neural circuits underlying the balance of risk vs. reward decision-making using optogenetics in primates

Peer-Reviewed Publication

INSTITUTE FOR THE ADVANCED STUDY OF HUMAN BIOLOGY (ASHBI), KYOTO UNIVERSITY

Life consists of infinite possibilities — appearing in the real world as multiple choices, that then require decision-making in order to determine the best course of action. However, with every choice there also exists a certain amount of uncertainty or 'risk'. Therefore, behind every decision, lies an intricate evaluation process that balances the 'risks' and 'rewards' associated with taking such actions. This can, in extreme cases, manifest itself as a pathological behavioral state of high risk-high return (HH) and low risk-low return (LL) decision processing that has been associated with gambling disorders

IMAGE:

BANANAS REPRESENT THE REWARD AND THE

Aim:

To craft ***effective*** news releases by ***efficient*** system

Effective news releases

- ✓ Catch an interest **at glance**
- ✓ **Easy-to read** writing with **Scientific findings**

Efficient system

- ✓ Process with **minimal staffing**
- ✓ Complete preparation by **Embargo date**

EurekAlert!

NEWS RELEASE 20-MAY-2024

One essential step for a germ cell, one giant leap for the future of reproductive medicine

ASHBi researchers now reveal the mechanisms driving epigenetic reprogramming and differentiation during human germ cell development, paving the way to the potential future treatment of infertility

Peer-Reviewed Publication

INSTITUTE FOR THE ADVANCED STUDY OF HUMAN BIOLOGY (ASHBI), KYOTO UNIVERSITY

KYOTO, Japan – May 20, 2024

Infertility affects approximately 1 in 6 people in their lifetime worldwide according to the World Health Organization (WHO). Infertility —as defined by the American Society for Reproductive Medicine (ASRM)— is a disease, condition, or status characterized by "the inability to achieve a successful pregnancy based on a patient's medical, sexual, and reproductive history, age, physical findings, diagnostic testing, or any combination of those factors" or requiring medical intervention such as the

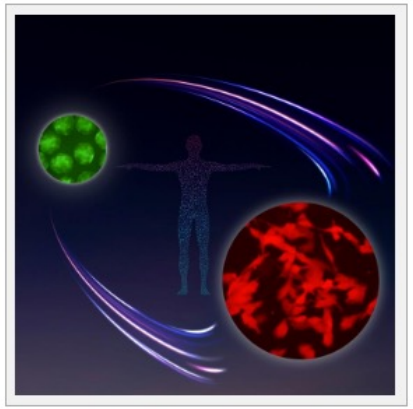
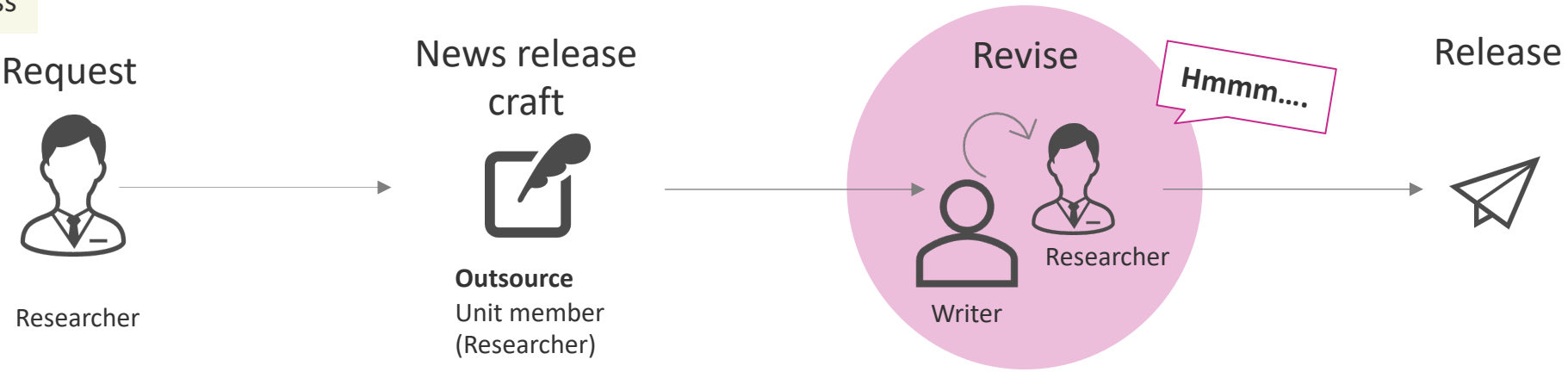


IMAGE:

Issue:

Discrepancy between researcher and writer

The process



1. The news release is a story - need **storyline** for the public
2. The news release should have research findings - need **sufficient enough science**

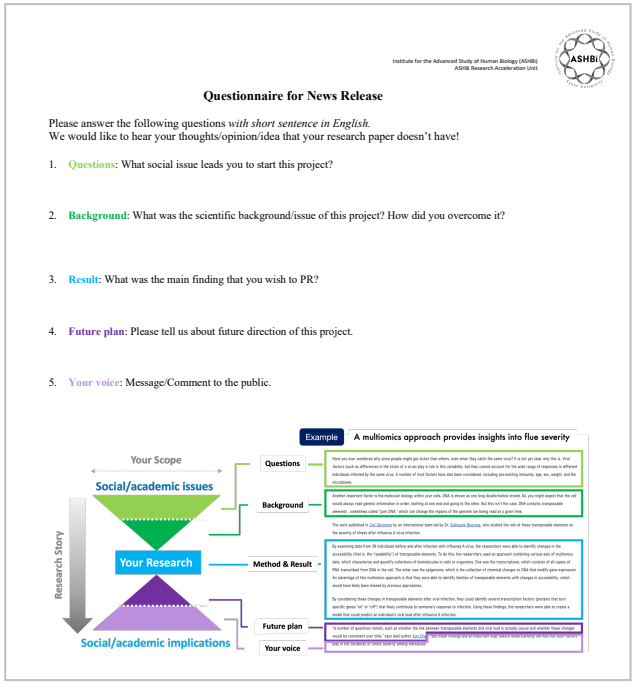
Writers/PR staff ↕ Researchers

➡ The news release requires both 1 and 2 !!

We need the solution for overcoming this discrepancy

Solution:

Create storyline by **Questionnaire**



Institute for the Advanced Study of Human Biology (ASHBi)
ASHBi Research Acceleration Unit

Questionnaire for News Release

Please answer the following questions *with short sentence in English.*
We would like to hear your thoughts/opinion/idea that your research paper doesn't have!

1. **Questions**: What social issue leads you to start this project?
2. **Background**: What was the scientific background/issue of this project? How did you overcome it?
3. **Result**: What was the main finding that you wish to PR?
4. **Future plan**: Please tell us about future direction of this project.
5. **Your voice**: Message/Comment to the public.

Example — A multiomics approach provides insights into flue severity

Your Scope
Social/academic issues
Your Research
Social/academic implications
Research Story
Questions
Background
Method & Result
Future plan
Your voice

Q1. What social issue leads you to start this project?

The connection between this research and public

Q2. What was the scientific background/issue of this project? How did you overcome it?

Sci. background to facilitate reader's understanding

Q3. What was the main finding you *wish* to PR?

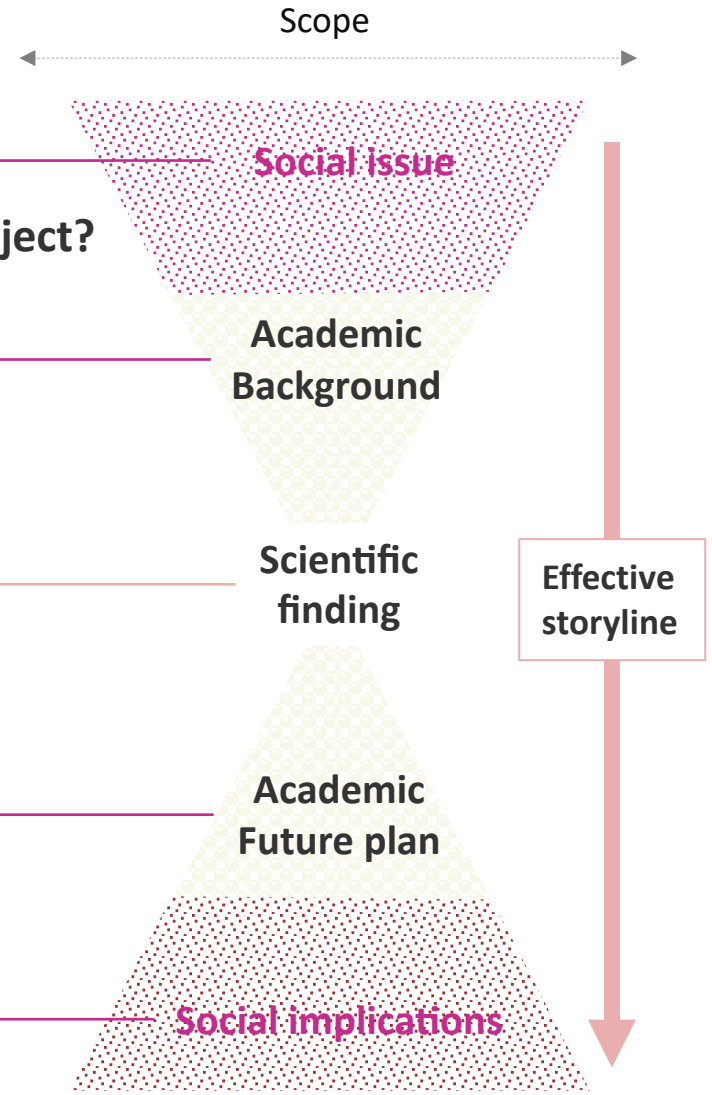
Research PR point (new findings)

Q4. Please tell us the future direction of this project.

Sci. direction to facilitate reader's deep consideration

Q5. Message/comment to the public

The connection between findings and future



Answering this questionnaire automatically craft the storyline!

Example – how it looks like

One essentioal Step for a Germ Cell, One Giant Leap for the Future of Reproductive Medicine

KYOTO, Japan – May 20, 2024

Infertility affects approximately 1 in 6 people in their lifetime worldwide according to the World Health Organization (WHO). Infertility —as defined by the American Society for Reproductive Medicine (ASRM)— is a disease, condition, or status characterized by "the inability to achieve a successful pregnancy based on a patient's medical, sexual, and reproductive history, age, physical findings, diagnostic testing, or any combination of those factors" or requiring medical intervention such as the use of mature donor gametes "to achieve a successful pregnancy either as an individual or with a partner". Although assisted reproductive technologies (ARTs), such as in vitro fertilization (IVF), have had a tremendous impact in treating certain forms of infertility —not all forms of infertility (as defined by the ASRM) can be targeted with existing strategies.

Recently, one powerful technology has emerged —known as human in vitro gametogenesis (IVG)— using pluripotent stem cells (PSCs) such as induced pluripotent stem cells (iPSCs) from patients, to generate human germ cells with the capacity to potentially give rise to mature gametes in culture, offering a gateway to treating all form of infertility —independent of gender. Nevertheless, human IVG research still remains in its infancy, with the current goal being to reconstitute the complete process of human gametogenesis. To date, one major challenge has been to recapitulate in the founder population of germ cells, or the human primordial germ cells (hPGCs), a hallmark event known as epigenetic reprogramming —in which the inherited parental "memory" of cells, present on its DNA, is reset/erased— that is required for proper germ cell differentiation.

Now, in a study published in *Nature*, researchers at the Institute for the Advanced Study of Human Biology (WPI-ASHBi) in Kyoto University, led by Dr. Mitinori Saitou, identify robust culture conditions necessary to drive epigenetic reprogramming and germ cell differentiation into precursors of mature gametes, the mitotic pro-spermatogonia and pro-oogonia with the capacity for extensive amplification, achieving a new milestone for human IVG research.

Previous work from Saitou's team and other groups were successful in generating so-called human primordial germ cell-like cells (hPGCLCs) from PSCs in vitro, which recapitulated several fundamental features of hPGC, including the capacity to propagate. However, these hPGCLCs were unable to undergo epigenetic reprogramming and differentiation. Although such limitations could be bypassed by aggregating hPGCLCs with mouse embryonic (non-germinal) gonadal cells to mimic the microenvironment of the testis/ovary, thereby effectively "reconstitute" the tissue(s). However, this process is highly inefficient (with approximately only 1/10th of cells differentiating). Furthermore, the introduction of non-human cells is neither ideal nor practical from a clinical application perspective. Therefore, in order to achieve the ultimate goal of human IVG research, it is essential to identify the minimal culture conditions necessary to generate mature human gametes.

In their new study, Saitou and colleagues conducted a cell culture-based screen to identify potential signaling molecules required to drive epigenetic reprogramming and differentiation of hPGCLCs into mitotic pro-spermatogonia and oogonia. Surprisingly, the authors found that the well-established developmental signaling molecule, bone morphogenetic protein (BMP), played a crucial role in this reprogramming and differentiation process of hPGCLCs.

"Indeed, considering that BMP signaling already has an established role in germ cell specification, it was highly unexpected that it also drives hPGCLC epigenetic reprogramming" comments Saitou.

Remarkably, these hPGCLC-derived mitotic pro-spermatogonia/oogonia not only displayed similarities in gene expression and epigenetic profiles to that of actual hPGC differentiation in our bodies, but also underwent extensive amplification (over 10 billion-fold). *"Our approach enables near-indefinite amplification of mitotic pro-spermatogonia and oogonia in culture and we now also have the ability to store and re-expand these cells as needed"* says Saitou.

The authors also revealed the potential mechanisms of how BMP signaling may be leading to epigenetic reprogramming and hPGCLC differentiation. *"BMP (signaling) appears to be attenuating the MAPK/ERK (mitogen-activated protein kinase/extracellular-regulated kinase) signaling pathway and both the de novo and maintenance activities of DNMT (DNA methyltransferase), but further investigation will be necessary to determine the precise mechanism and whether this is direct or indirect"*, explains Saitou.

"Our study represents not only a fundamental advance in our understanding of human biology and the principles behind epigenetic reprogramming in humans but also a true milestone in human IVG research" says Saitou.

Saitou comments, *"although many challenges remain and the path will certainly be long, especially when considering the ethical, legal, and social implications associated with the clinical application of human IVG, nevertheless, we have now made one significant leap forward towards the potential translation of IVG into reproductive medicine."*

These findings were published in *Nature* on May 20th 2024.

EurekAlert!

NEWS RELEASE 20-MAY-2024

One essential step for a germ cell, one giant leap for the future of reproductive medicine

ASHBi researchers now reveal the mechanisms driving epigenetic reprogramming and differentiation during human germ cell development, paving the way to the potential future treatment of infertility

Peer-Reviewed Publication

INSTITUTE FOR THE ADVANCED STUDY OF HUMAN BIOLOGY (ASHBI), KYOTO UNIVERSITY


nature

Accelerated Article Preview

In vitro reconstitution of epigenetic reprogramming in the human germ line

ACCELERATED ARTICLE PREVIEW

Murase et al (2024)., *Nature*
DOI: 10.1038/s41586-024-07526-6

KYOTO, Japan – May 20, 2024

Infertility affects approximately 1 in 6 people in their lifetime worldwide according to the World Health Organization (WHO). Infertility —as defined by the American Society for Reproductive Medicine (ASRM)— is a disease, condition, or status characterized by "the inability to achieve a successful pregnancy based on a patient's medical, sexual, and reproductive history, age, physical findings, diagnostic testing, or any combination of those factors" or requiring medical intervention such as the

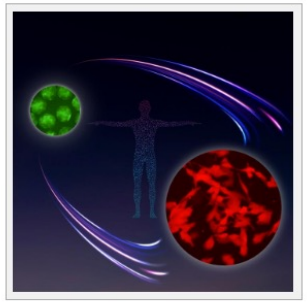


IMAGE:

- Identified the key protein that enable to maintain and expand **human germ cell-like cells** that derived from human iPS cell
  （ヒトiPS由来の卵子・精子のもとなる細胞を正常に維持・増殖させるタンパク質を同定）
- Allow to study human germ cell development *in vitro*
  （今まで技術的・倫理的に困難だった生殖細胞発生研究が発展）

Example – how it looks like

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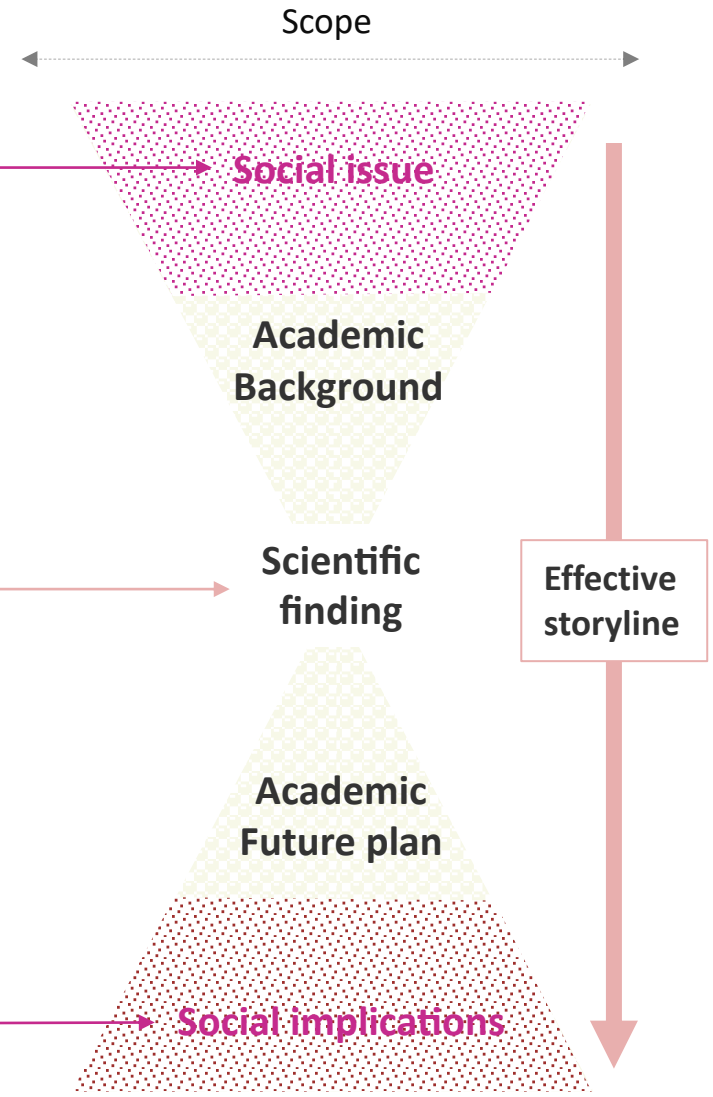
Social issue (Not necessarily written in the article)

Identified the key protein that enable to maintain and expand **human germ cell-like cells** that derived from human iPS cells

Scientific findings (written in the article)

...we have now made one significant leap forward towards **the potential translation of IVG**(試験管内卵子・精子形成) **into reproductive medicine.**

Social implication (Not necessarily witten in the article)



Sharing the storyline helps to shorten the process time

Murase et al (2024)., *Nature*

- Accelerated Article Preview (AAP)
- Requested to have a press conference


EurekAlert!

NEWS RELEASE 20-MAY-2024

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IMAGE:

DOI: 10.1038/s41586-024-07526-6

As of 6/12 (one month)

Online attention

PV in EurekAlert! = 1,400

120 tweeters

2 blogs

23 news outlets

1 Redditors

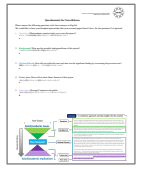
5 Mendeley

Top 1%!!

This article is in the 99th percentile (ranked 1,207th) of the 206,661 tracked articles of a similar age in all journals and the 86th percentile (ranked 107th) of the 774 tracked articles of a similar age in *Nature*

View more on Altmetric

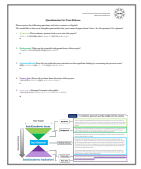
Request



5/8

Researcher

News release crafting

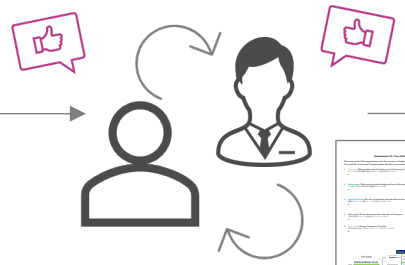


Outsource

Unit member

(Researcher)

Revise



The revise time

Release

5/19

Publication date = 5/20

The process

Within 24 hours = One round of Emails

Summary:

Using questionnaire facilitates our news release crafting

Institute for the Advanced Study of Human Biology (ASHBi)
ASHBi Research Acceleration Unit

Questionnaire for News Release

Please answer the following questions *with short sentence in English.*
We would like to hear your thoughts/opinion/idea that your research paper doesn't have!

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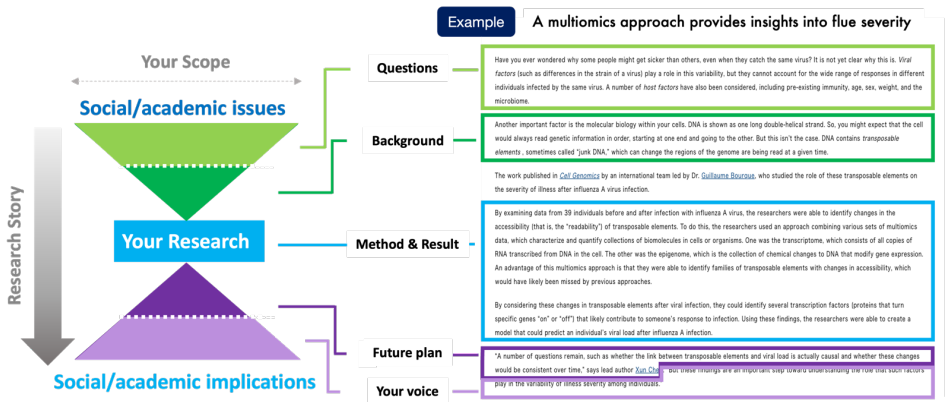


Answer the questionnaire

Effective

- ✓ Automatically craft the **storyline**
- ✓ Obtain the PR point **(Scientific findings)** from researcher

Share the questionnaire

Efficiently

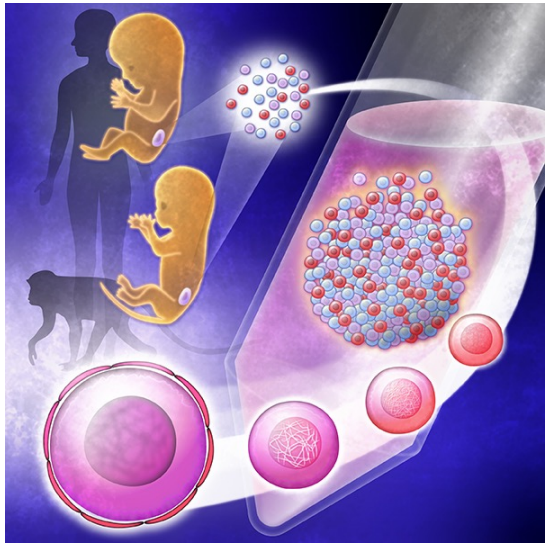
- ✓ Avoid the discrepancy
- ✓ Shorten the revise process

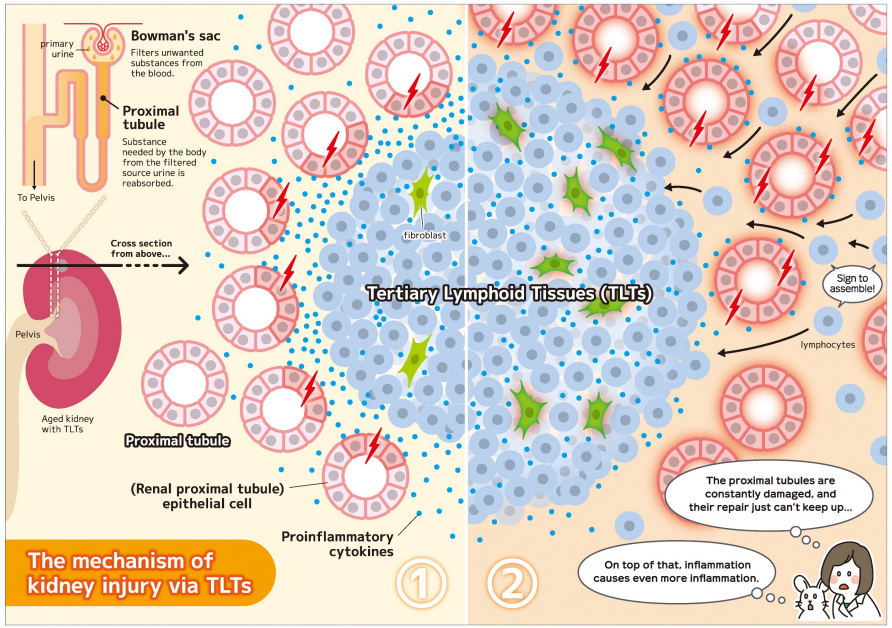
"Production time = 1 – 2 weeks"

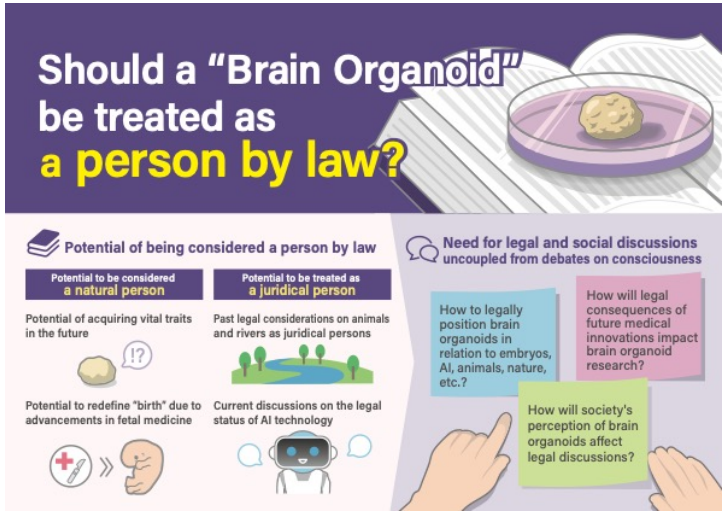
Visual is another key

Utilize the same questionnaire for visual creation!

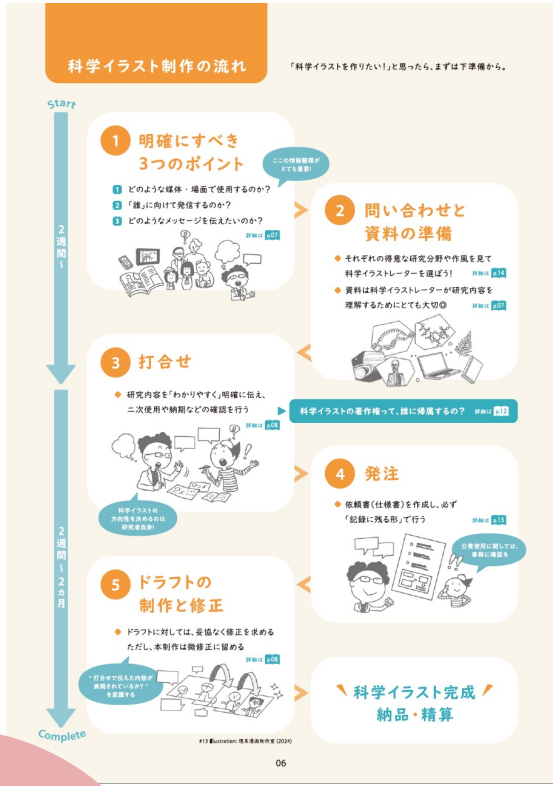
Production time = 2 – 4 weeks (outsource)







Pamphlet – Visualize your Research



The pamphlet is available at the desk!

Acknowledgement

Thank you for your attention!

ASHBi Research Acceleration Unit
Tadashi Ogawa
Spyros Goulas
Makoto Shida
Chieko Chiwata

ASHBi Office
Fumi Komori
Narumi Sano
Mayuko Sawamori
Chisato Kaya

Institute for Life and Medical Sciences
Hiromi Sumita

ASHBi WPI Kyoto University

京都大学 KYOTO UNIVERSITY

wpi World Premier International Research Center Initiative