B - C O N 5

Biofunctional
Finding
Organization

Biofunctional Finding Conference 5

HUMAN ACTIVITIES and BIOFUNCTIONAL RESEARCH in ICHIKAWA City

Saturday 16th Aug 2025
ICHIKAWA City
JAPAN

〒272-0023
101, 5-3-2, Minami-yawata,
Ichikawa-City, Chiba, JAPAN

For B-CON5

We sincerely thank you for participating in B-CON5 today. The host city of this conference, Ichikawa City in Chiba Prefecture, has long been known as a “crossroads of culture and history.” Blessed by the flow of the Edo River and the resources of Tokyo Bay, Ichikawa prospered as a post town and agricultural area near Edo during the Edo period. Even today, Ichikawa’s pears are nationally famous and cherished as an autumn delicacy. In addition, nori seaweed cultivation and traditional crafts flourish, enriching the local lifestyle and industry.

The theme of this conference, HUMAN ACTIVITIES and BIOFUNCTIONAL RESEARCH, explores the relationship between human activities and biological functions from multiple perspectives, encompassing the influence of culture, history, and the environment on human endeavors. A region like Ichikawa, where people, nature, culture, and daily life have developed in harmony, provides an ideal setting to reflect deeply on this theme.

We sincerely hope that the presentations of the latest research findings and innovative approaches, as well as the discussions during the conference, will generate new ideas and foster interdisciplinary collaboration. We also encourage all participants to take the opportunity to experience Ichikawa’s streets, local cuisine, and historical heritage during the conference, and to appreciate the unique charm of this city.

This organization was born as a "life science study group" together with members who shared the desire to research and develop human biological functions and related fields in Kyushu. In 2018, we continued our activities while changing the name to "Biofunctional Finding Organization (BFO)", and this year 2025 is the 8th year.

I look forward to sharing diverse perspectives and knowledge and having a fruitful time. I hope this conference will be beneficial to all of you and provide profound inspiration.

We would like to express our sincere gratitude to all those concerned for their efforts in holding this conference.

Chairperson

Biofunctional Finding Conference 5

KIYOKAWA Takuma

B-CON5

Biofunctional Finding Conference 5

EVENT : Biofunctional Finding Conference 5 (B-CON5)

DATE : Saturday 16th Aug 2025

PLACE : 〒272-0023, 101, 5-3-2, Minami-yawata, Ichikawa-City, Chiba, JAPAN

THEME : HUMAN ACTIVITIES and BIOFUNCTIONAL RESEARCH
in ICHIKAWA City

Chairperson : KIYOKAWA Takuma

PROGRAM :

Day	Time	Topic
16, Aug	14:00～14:10	Opening
	14:10～15:10	Report
	15:10～15:40	General Meeting & Board of Directors
	15:40～15:50	Closing remarks

[Research report recruitment]

Deadline for submitting the final:

Friday, August 8, 2025, 5:00 p.m. (JST)

Guidelines for Paper Submissions:

We are looking for papers on a wide range of biological functions. Anyone involved in related fields, regardless of affiliation, can apply. Please include the presentation title, affiliation, presenter's name, and co-author's names, and summarize your paper in terms of [Objective], [Method], [Results], and [Conclusion]. Submit your paper in a total of 500 characters or less. If you have any questions, please contact the secretariat.

Receipt and acceptance of reports:

If you submit a report by email, we will notify you. If you do not receive a reply, please contact the secretariat.

We will inform you later about the acceptance / rejection of the submitted report (review result). Reports are slide presentations or poster presentations.

[Registration]

Date and time of registration and payment of participation fee:

Friday, August 8, 2025, 5:00 p.m. (JST) ／ ￥5,000（JPY）

※Once you have received the fee, it cannot be refunded.

[PAYEE]

Bank transfer: Japan Post Bank ⇒**Same bank**: 10500-93149501

⇒**Other bank**: [store] 058 [account] 9314950)

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Abstract (Report)

01

Impact of a Smartphone Practicum-Support App on Nursing Students' Learning Motivation: Pre- and Post-Practicum Comparison in Acute Care

KAGAWA Shota
Makuhari Faculty of Human Care, Tohto University

Objective

Within the framework of Self-Determination Theory, this study examined how introducing a smartphone-based practicum-support application during an acute-care nursing practicum alters students' learning motivation and derived implications for practicum design. Usability and satisfaction data on the same app have been reported elsewhere.

Methods

Among 107 third-year students at University A, 12 who consented to use the app (response rate = 11.2 %) completed the Academic Motivation Scale-College version (AMS-C 28) one week before and on the final practicum day. The 28-item, seven-subscale AMS-C 28 showed good internal consistency (Cronbach's α = 0.84). Normality was verified with the Shapiro-Wilk test; paired t-tests were performed (α = 0.05; 0.05 < p < 0.10 interpreted as a trend) and Cohen's d calculated. Semi-structured interviews with seven app users were thematically analyzed for motivation-related content.

The native iOS/Android app, built with the no-code platform Adalo, provided five functions—pre-practicum self-assessment, competence progress logs, visual dashboards, daily reports, and reference-book viewing. Gamification (badges, progress bars) and real-time sharing with faculty were incorporated.

Results

Total intrinsic motivation rose from 36.08 ± 9.80 to 41.08 ± 14.20 (Δ = +5.00, p = 0.075, d = 0.41) and total extrinsic motivation from 53.42 ± 10.39 to 58.83 ± 10.29 (Δ = +5.42, p = 0.058, d = 0.52). Significant increases occurred in "intrinsic motivation to experience" (8.58 ± 3.29 → 11.00 ± 4.95; Δ = +2.42, p = 0.046, d

= 0.57) and “identified regulation” (20.58 ± 4.34 → 23.42 ± 3.29; Δ = +2.83, p = 0.037, d = 0.73); amotivation remained unchanged.

Interview data supported the quantitative findings: students valued instantaneous access to self-evaluation and references even while commuting, visualized progress that fostered a sense of growth, and timely, detailed faculty feedback. They requested template-based questioning and automated positive feedback functions to further enhance engagement.

Conclusion

Embedding the gamified, real-time sharing app in an acute-care nursing practicum appears to strengthen intrinsic motivation related to experiential learning and identified extrinsic motivation linking study with professional identity, thereby elevating overall learning motivation. Gamification and immediate data sharing likely accelerated self-regulated learning cycles. Future work should incorporate control groups and function-specific analyses to refine both practicum design and app features that most effectively sustain motivation.

Table. Pre- and Post-Practicum Changes in Learning Motivation

	Pre-practicum	Post-practicum			
	Mean（SD）	Mean（SD）	Mean Δ	p-value	Cohen's d
Intrinsic – Knowledge	16.00 (4.86)	17.00 (5.13)	1.00	0.251	0.20
Intrinsic – Accomplishment	11.50 (3.83)	13.08 (5.89)	1.58	0.194	0.32
Intrinsic – Experience	8.58 (3.29)	11.00 (4.95)	2.42	0.046 **	0.57
Total Intrinsic Motivation	36.08 (9.80)	41.08 (14.20)	5.00	0.075 *	0.41
Extrinsic – Identified	20.58 (4.34)	23.42 (3.29)	2.83	0.037 **	0.73
Extrinsic – Introjected	12.83 (5.15)	14.33 (6.98)	1.50	0.265	0.24
Extrinsic – External Regulation	20.00 (3.79)	21.08 (3.53)	1.08	0.348	0.30
Total Extrinsic Motivation	53.42 (10.39)	58.83 (10.29)	5.42	0.058 *	0.52
Amotivation	7.42 (3.58)	7.42 (4.78)	0.00	1.000	0.00

*p<.10, **p<.05

02

Examination of Regional Differences and the Effects of Support Types on Weight and Waist Circumference in Specific Health Guidance

KIYOKAWA Takuma
Makuhari Faculty of Human Care, Tohto University

Introduction

Specific health guidance (SHG) is provided to individuals at risk of metabolic syndrome to prevent lifestyle-related diseases. SHG is classified into two types based on the degree of intervention: "intensive support" and "motivational support," each employing different intervention strategies. Intensive support involves continuous and comprehensive intervention, whereas motivational support primarily consists of shorter-term guidance. While numerous studies have examined the effects of SHG, few have focused on the relationship between the facility location and participants registered residential addresses. This study aimed to examine the association between participants' residential regions and the effectiveness of SHG in terms of weight and waist circumference changes at facilities affiliated with our association from fiscal year 2008 to 2018.

Methods

Participants were individuals who received SHG at facilities affiliated with our association between 2008 and 2018. Participants were categorized into North Kanto, Saitama, Chiba, Kanagawa, Tokyo (by 23 wards), and regions outside Kanto. The number of intensive and motivational support cases, as well as changes in body weight and waist circumference, were compared across regions.

Ethical Considerations

This study was approved by the institutional ethics committee. Data were securely stored in a locked cabinet. Participants were informed in writing and verbally about the use of their data at the time of health checkups and the initial SHG session.

Results

There were 530 cases of intensive support, including 5 in North Kanto and 525 in South Kanto (Saitama, Chiba, Kanagawa, Tokyo). There were 577 cases of motivational support, including 5 in North Kanto and 572 in South Kanto.

In South Kanto, the mean weight reduction for intensive support ranged from 1.79 to 2.05 kg, and mean circumference reduction ranged from 2.21 to 2.60 cm. For motivational support, mean weight reduction ranged from 1.09 to 1.73 kg, and mean waist circumference reduction ranged from 0.83 to 2.23 cm. Similar trends were observed in North Kanto and regions outside Kanto, with intensive support generally producing greater reductions in weight and waist circumference than motivational support.

A detailed analysis of Tokyo's 23 wards revealed that in central wards (Chiyoda, Chuo, Minato), mean weight reduction with intensive support ranged from 1.34 to 2.69 kg, and mean waste reduction ranged from 2.25 to 3.42 cm. For motivational support, mean weight change ranged from -0.14 to 0.77 kg, and waste reduction ranged from 0.20 to 1.04 cm. In eastern wards (Taito, Sumida, Koto, Arakawa, Adachi, Katsushika, Edogawa), intensive support produced mean weight reduction of 1.56 to 3.90 kg and waste reduction of 0.63 to 8.00 cm. Motivational support in these wards yielded mean weight reduction of 0.58 to 2.54 kg and waste reduction of -0.94 to 2.92 cm.

Discussion

The results indicate that intensive support is more effective than motivational support in reducing weight and waist circumference. However, the effects varied depending on the participants' residential regions relative to the facility location. Analysis by word in Tokyo suggests that regional socioeconomic background and lifestyle factors may influence SHG effectiveness. In central wards, where health awareness is higher, intensive interventions may be particularly effective. Conversely, in certain words, motivational support produced better outcomes, possibly due to sample bias or a better fit between the intervention and the participants' characteristics.

Furthermore, motivational support tended to be more common in regions farther from the facilities. Intensive support requires multiple visits and continuous engagement, which may have led some participants in distant regions to refrain from participating.

03

Survey on Nurses' Attitudes Toward Physical Restraints

SHIMAZU Yusuke
Makuhari Faculty of Human Care, Tohto University

[Introduction]

Physical restraints compromise human dignity and, therefore, should not be implemented as a standard practice. However, in medical institutions where patient treatment takes place, there are situations in which physical restraints are necessary to ensure patient safety. During my clinical experience, I have struggled with the ethical dilemma between the belief that restraints are necessary for safety and the desire to avoid using them whenever possible. This study aims to examine nurses' attitudes toward physical restraints at our hospital and to consider how we should approach restraint use in the future. The findings are presented and discussed below.

[Methods]

The study targeted 41 nurses working in inpatient wards at our hospital. A self-developed questionnaire focusing on physical restraint was used to assess their attitudes. The questionnaire consisted of both multiple-choice and open-ended questions, covering the following five topics:

1.Experience with physical restraints
2.Emotional responses when using restraints
3.Criteria for initiating restraints
4.Patient care during restraint
5.Perceptions of restraint removal

[Results]

1.Experience: Almost all participants reported having used physical restraints.
2.Emotional Responses: All respondents agreed with the statement, "I would prefer not to use restraints if possible."
3.Initiation Criteria: Only seven respondents indicated they effectively utilized the hospital's physical restraint guidelines from the medical safety manual.
4.Care During Restraint: Nearly all participants agreed with the statements "We provide care using the most effective and least burdensome methods to ensure

patient safety," and "We observe patients for potential adverse effects on joints, muscles, skin, and mental state."
5.Restraint Removal: Many nurses reported that "conferences are not functioning effectively" and "I feel responsible if an accident occurs after restraints are removed."
Suggestions for reducing restraint use included: securing sufficient staffing, improving the care environment, prioritizing pharmacological management, increasing awareness of the guidelines, and enhancing knowledge and awareness through study sessions.

[Discussion]

This survey revealed that although most nurses recognize that physical restraints should ideally be avoided, they still consider them necessary in some situations and apply them accordingly. Regarding decisions to initiate or remove restraints, many respondents indicated difficulty in applying the guidelines, lack of clarity in criteria, and reliance on conferences for removal decisions.
To minimize the use of physical restraints and reduce ethical dilemmas faced by nurses, we propose the following measures:

1.Revise the physical restraint guidelines in the medical safety manual to clearly define the criteria for implementation and removal.

2.Utilize the guidelines during conferences as a standardized framework for decision-making regarding the use and discontinuation of physical restraints.

04

Epidural Analgesia in Childbirth in Japan: Current Status, Personal Experience, and Challenges

KIYOKAWA Yuka
KENKOIGAKU association

Introduction

Epidural analgesia is a method of reducing labor pain by administering anesthesia that blocks nerves in the back. The most commonly used techniques are epidural anesthesia and combined spinal-epidural anesthesia (Ministry of Health, Labour and Welfare, 2020). Although epidural analgesia is widely used in Western countries, its adoption in Japan remains limited. This paper aims to clarify the benefits of epidural analgesia through personal experience and to discuss challenges in its wider implementation.

Current Status in Japan

As of recent surveys, 505 obstetric facilities in Japan provide epidural analgesia, accounting for 26% of all delivery facilities (Japan Society of Obstetrics and Gynecology, 2021). The rate of epidural-assisted deliveries was 6.1% in 2016 and 8.6% in 2020, indicating a gradual increase. In contrast, Western countries report 60–80% of deliveries using epidural analgesia, highlighting Japan's low adoption rate.

Personal Experience

In March 2025, the author delivered her first child using epidural analgesia. The decision was motivated by the desire to reduce labor pain and conserve strength for postpartum childcare. The availability of a nearby facility and affordable costs facilitated the choice of epidural delivery.

Although planned deliveries are standard, the author experienced spontaneous labor prior to the scheduled date. Epidural anesthesia was initiated upon hospital arrival, reducing pain to a level like menstrual cramps. Cervical dilation progressed to 8 cm with manageable pain; however, pressure sensations increased as the fetus descended. Epidural analgesia effectively reduced labor pain while preserving the mother's ability to push. The total delivery time was 10 hours, during which the author-maintained sleep and nutrition, preserving physical strength. Postpartum,

mother-infant rooming-in was implemented from day one, allowing real-time guidance from healthcare staff and reducing psychological burden, potentially contributing to postpartum depression prevention.

Challenges

Despite the availability of epidural analgesia, many women cannot access it due to economic or logistical barriers. A survey in Tokyo indicated that 44% of women who wished to receive epidural analgesia were unable to do so (Tokyo Metropolitan Government, 2023). Common reasons included conversion to cesarean delivery, high costs, and lack of nearby facilities. To ensure equitable access, epidural analgesia should become a standard option for eligible women. Financial support initiatives, currently piloted in Tokyo, should be expanded nationwide.

Conclusion

Epidural analgesia effectively reduces labor pain, preserves maternal strength, and alleviates psychological burden, potentially aiding postpartum childcare and depression prevention. Nationwide implementation requires strengthening medical infrastructure and providing financial support, enabling all eligible women to choose epidural analgesia when desired.

References

Ministry of Health, Labour and Welfare. (2020). Guidelines for epidural analgesia in childbirth.

Japan Society of Obstetrics and Gynecology. (2021). Survey on facilities providing epidural analgesia.

Tokyo Metropolitan Government. (2023). Survey on the use and demand of epidural analgesia.

05

The Role of University Libraries in Addressing Emerging Social Challenges: A Case Study on Support for Young Carers

IMOTO Saori
Makuhari Faculty of Human Care, Tohto University

Objective

This study aims to examine how university libraries in Japan respond to emerging social issues by investigating the availability of materials related to "young carers"—a relatively new concept in Japanese society. The research explores whether university libraries are equipped to support students who may themselves be young carers or former young carers.

Methods

A total of 59 books and audiovisual materials related to young carers were selected through subject and keyword searches in CiNii Books. Holdings data were collected from 777 universities registered in NACSIS-CAT, including national, public, and private institutions. The analysis focused on two main factors: (1) the relationship between university type (national, public, private) and holdings, and (2) the relationship between university size (classified as A–D) and the number of holdings.

Results

The results revealed significant disparities in holdings based on university type and size. National and public universities had higher holding rates, while approximately one-third of private universities held none of the selected materials. Larger universities (size A) tended to have more holdings, but some smaller institutions, particularly teacher-training universities, also showed active collection efforts. In contrast, technical and arts-focused universities, especially those with a narrow disciplinary scope, often had no holdings. This suggests a gap in access to information for students who may be affected by the young carer issue.

Table 1. Universities with the Most Holdings (National Universities)

University Name	University Size	Number of Holdings
Hokkaido University of Education	D	24
Osaka Kyoiku University	D	23
Shimane University	B	22
The University of Tokyo	A	21
Kanazawa University	A	20
Kyoto University	A	20
Nagoya University	A	19
Kagoshima University	A	19
Hokkaido University	A	18
Miyagi University of Education	D	18
Kyushu University	A	18
University of the Ryukyus	B	18

Table 2. Universities with the Most Holdings (Public Universities)

University Name	University Size
Saitama Prefectural University	D
Osaka Metropolitan University	A
Tokyo Metropolitan University	B
Tsuru University	C
University of Shimane	C
Prefectural University of Hiroshima	B
Aichi Prefectural University	B
Hiroshima City University	C
Aomori University of Health and Welfare	D
Iwate Prefectural University	C
Mie Prefectural College of Nursing	D
Kumamoto Prefectural University	C

Table 3. Universities with the Most Holdings (Private Universities)

University Name	Number of Holdings
Kwansei Gakuin University	41
Chubu Gakuin University	38
Hokusei Gakuen University	37
Nihon Fukushi University	37
Kansai University of International Studies	35
Shukutoku University	33
Tohoku Fukushi University	31
Daito Bunka University	31
Hokushō University	30
Bunkyo University	30
Shitennoji University	30

Table 4. Median Number of Holdings and Total Volumes by University Size

Category	Median Number of Holdings	Median Total Volumes
National and Public Universities (Overall)	7.0	7.0
University Size A	15.5	16.5
B	7.0	8.0
C	7.0	7.0
D	2.0	2.0

Table 5. List of Universities with Zero Holdings (National and Public Universities)

Type	University Name	University Size
National	Muroran Institute of Technology	D
National	Kitami Institute of Technology	D
National	Tokyo University of the Arts	C
National	Tokyo University of Marine Science and Technology	C
National	The University of Electro-Communications	D
National	Nagaoka University of Technology	D
National	The Graduate University for Advanced Studies (SOKENDAI)	D
National	Hamamatsu University School of Medicine	D
National	Nagoya Institute of Technology	D
National	Japan Advanced Institute of Science and Technology	D
National	Nara Institute of Science and Technology	D
National	National Institute of Fitness and Sports in Kanoya	D
Public	Yamagata Prefectural Yonezawa University of Nutrition Sciences	D
Public	Tohoku University of Agriculture and Forestry	D

Conclusion

The findings highlight the influence of institutional characteristics—such as size, type, and academic focus—on the responsiveness of university libraries to new social issues. While some libraries demonstrate proactive collection practices, others lack relevant materials, potentially limiting support for student carers. University libraries must consider not only academic needs but also the diverse social realities of their students. Addressing these disparities is essential for creating inclusive and supportive learning environments.

06

Development and Evaluation of an Insect Trapping Device —A Safe and High-Efficiency Capture Technology Utilizing Fermentation-Derived Carbon Dioxide and Multiple Attractants—

NEMOTO Seiji
Makuhari Faculty of Human Care, Tohto University

Background

Blood-feeding insects such as mosquitoes and black flies are vectors of infectious diseases including dengue fever, Zika virus infection, and Japanese encephalitis. These vector-borne diseases remain a global public health concern, particularly in tropical and subtropical regions. Conventional control methods, such as insecticides, repellents, and mosquito coils, have limitations: chemical exposure risks to humans, reduced portability, fire hazards, and environmental impacts. Additionally, the emergence of insecticide resistance and the environmental burden from chemical usage necessitate alternative approaches. Consequently, there is an urgent need for a trapping technology that is safe for humans and the environment, yet highly effective in capturing target insects.

Objective

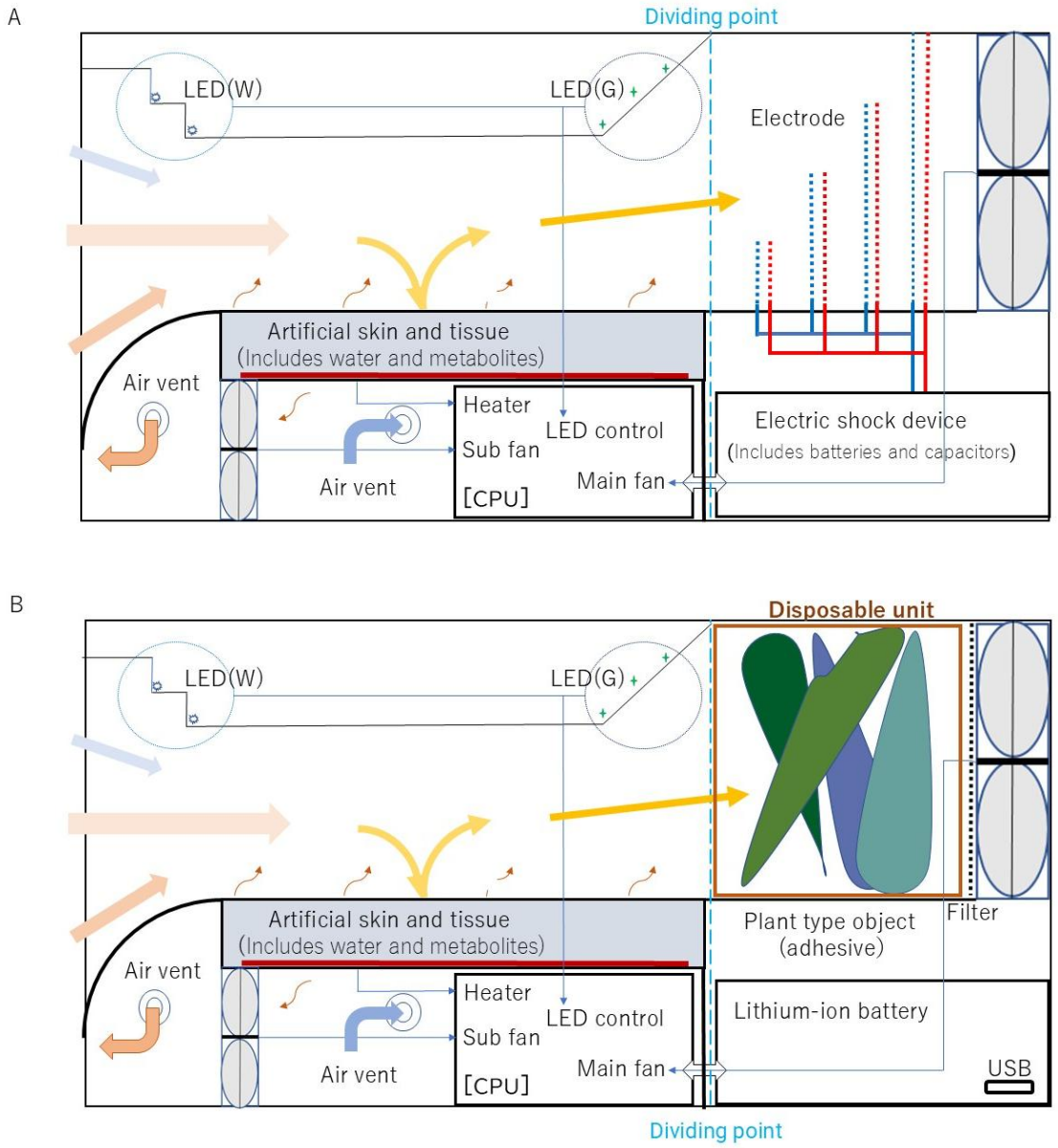
This study aims to develop an insect trapping device that combines multiple attractants—light, airflow, temperature, carbon dioxide, and fermentation odor—to achieve reliable capture of blood-feeding insects without causing harm to humans. The device is designed for both indoor and outdoor use, with portability, environmental safety, and operability in non-powered locations as key considerations.

Methods

The developed device consists of a main body with vertical and horizontal orientations, a front opening, a first attractant unit, a second attractant unit, and a trapping section.

First Attractant Unit: Generates an airflow from the front to the rear via a fan, and incorporates an LED-based lighting unit to attract insects visually.

Second Attractant Unit: Contains an attractant element generator that produces



carbon dioxide and fermentation odor through yeast fermentation, using molasses waste and brewer's yeast. A heating element beneath the generator promotes fermentation.

Airflow Structure: A sub-fan directs heat from the attractant generator and control unit toward the front, merging with the main airflow to guide insects deeper into the device.

Trapping Mechanisms: Two types are available—(1) adhesive sheets housed in a mesh bag for physical capture, or (2) an electric discharge unit with cathode and anode plates for immediate electrocution of insects.

Results

Operation tests showed that the LED lighting initially lured insects toward the device, while the combination of airflow, fermentation odor, and carbon dioxide effectively guided them into the main body. Heat from the attractant generator and control unit warmed the airflow to near body temperature, further enhancing the lure effect. The adhesive-based trapping mechanism provided easy replacement and continuous operation, while the electric discharge method achieved instant and reliable insect elimination. No adverse effects on human health or environmental emissions were observed, and the rechargeable battery enabled use in outdoor, off-grid environments.

Discussion

The device's key advantage lies in the synergistic effect of multiple attractants, surpassing the performance of single-attractant devices. The use of food-derived molasses waste and brewer's yeast ensures high safety while simultaneously providing two potent lures—fermentation odor and carbon dioxide. The airflow control system maintains favorable temperature, odor, and CO_2 concentration profiles for insects, improving capture efficiency. The ability to switch between adhesive and electric capture modes allows flexibility depending on environmental and operational needs. Importantly, the absence of chemical insecticides or open flames enhances user safety, reduces environmental impact, and supports portability.

Conclusion

The insect trapping device developed in this study successfully integrates light, airflow, temperature, carbon dioxide, and fermentation odor to achieve high capture efficiency while maintaining safety for humans and the environment. By avoiding chemical agents and enabling operation without external power sources, the device offers a sustainable and practical tool for preventing vector-borne diseases and improving public health. Future work should focus on field trials across different climates and regions to optimize performance and assess long-term durability.

About US

NAME: **Biofunctional Finding Organization, NPO**

Establishment(Certification): March, 20, 2015 （July, 22, 2019）

Adress: 1-1, Hibino, Mihama-ku, Chiba-shi, Chiba-ken, Japan, 〒261-0021

Objective:

This association conducts research and development of human biofunctional and its related fields. Promote the quest for the information and knowledge through dissemination and enlightenment. And it aims at contributing to the improvement of the quality of life of people and the public welfare. In addition, we aim to contribute internationally.

〈B-CON5 OFFICE〉

Chairperson : KIYOKAWA Takuma

Secretary General : KIYOKAWA Takuma

Member : NEMOTO Seiji

<DATA>

B-CON5 Chairperson : KIYOKAWA Takuma

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Day: 16, Aug, 2025