

# **Comprehensive Report on Attending the 4th Joint Meeting of Veterinary Science in East Asia**

**Haroon Afzal, PhD Candidate**

**International Program in Animal Vaccine Technology**

**National Pingtung University of Science and Technology (NPUST),  
Taiwan**

**Supervisor: Dr. Li-Ting Cheng**

---

## **Introduction:**

I had the privilege of attending and presenting at the prestigious **4th Joint Meeting of Veterinary Science in East Asia**, held from **8th to 9th September 2024**. This conference is recognized as one of the most significant gatherings in veterinary science, bringing together experts from Korea, Japan, China, and other regions to discuss crucial topics such as transboundary diseases, animal health, and innovations in vaccine development.

During this esteemed event, I delivered an oral presentation titled **“Signal Sequence Contributions to the Efficacy of PEDV Subunit Vaccines: Mechanistic Insights and Immunological Benefits.”** My presentation focused on the novel use of signal peptides and lipoproteins as adjuvants to boost the immune response in subunit vaccines targeting Porcine Epidemic Diarrhea Virus (PEDV). The presentation session was chaired by **Professor Taisuke Horimoto** from **The University of Tokyo**—a leading figure in veterinary science, which made this opportunity even more special.

---

## **Purpose of Attendance:**

The primary goal of my participation was to present my research, which investigates the role of **bacterial lipoproteins** as adjuvants in **PEDV subunit vaccines**. Specifically, my research focuses on the **modified COE (mCOE) domain** of the PEDV spike protein, in combination with a **signal peptide from *Pasteurella multocida* (PlpE)**, to enhance immunogenicity by activating **Toll-Like Receptor 2 (TLR2)** pathways.

The importance of this research cannot be overstated. PEDV is a highly contagious virus that has caused devastating losses in swine populations, especially in Asia. Developing a more effective subunit vaccine could significantly mitigate these outbreaks. The novelty of using bacterial lipoproteins as TLR2 agonists presents a new frontier in vaccine adjuvant research.

---

## **Detailed Experience and Learning Outcomes:**

### **1. Oral Presentation and Recognition:**

I had the honor of delivering a **7-minute presentation**, followed by a **3-minute Q&A session**, during which I discussed the mechanistic insights into how **signal peptides and lipoproteins** improve the immunological efficacy of subunit vaccines. I demonstrated the role of the **PlpE signal peptide** and how it was synthesized and confirmed using **SignalP-6.0 software**. My presentation also covered the **SDS-PAGE and western blotting** methods used to verify the expression and purification of the SP-mCOE sequences in *E. coli*.

The **experimental plan** of the study involved multiple vaccine formulations, such as the combination of mCOE with PlpE signal peptide and oil adjuvants like **ISA 206 W/O/W**. This multifaceted approach allowed me to highlight how signal peptides not only enhance **TLR2 activation**, but also induce a **higher cytokine expression profile**, a stronger **CD4+/CD8+ T cell population**, and increased **total IgG titers**. The impact of the signal peptide was further confirmed through **virus neutralization assays** and a **survival challenge assay**.

The session chair, **Professor Taisuke Horimoto**, praised the innovation behind my research and its potential impact on swine health management. The audience's feedback was overwhelmingly positive, especially regarding the integration of **TLR2 agonists** into subunit vaccines, which is an area of growing interest. Several attendees, including researchers from the University of Tokyo and other renowned institutions, expressed interest in exploring potential collaborations.

## **2. In-depth Scientific Discussions and Knowledge Gained:**

The conference covered a broad range of topics relevant to veterinary science. I attended several sessions that were highly relevant to my research, particularly those focused on **vaccine adjuvants** and **innate immunity**. One of the most enlightening discussions involved the latest findings in the use of **TLR agonists** in veterinary vaccines. This session emphasized the pivotal role that TLRs, particularly **TLR2 and TLR5**, play in enhancing immune responses—an area that aligns closely with my work on bacterial lipoproteins and flagellin.

The diverse array of keynote presentations and scientific sessions offered me the chance to deepen my understanding of **transboundary diseases**, **antimicrobial resistance**, and **vaccine technology**. For instance, the session on **African Swine Fever (ASF)** provided valuable insights into the ongoing challenges in developing an effective vaccine for ASF, a disease with similar impacts on swine populations as PEDV. This session inspired me to consider future research directions that could extend my work on PEDV vaccines to other swine diseases.

## **3. Networking and Collaboration Opportunities:**

This conference provided an unparalleled platform for networking. I had the privilege of interacting with **veterinary vaccine researchers** from across East Asia and beyond. Conversations with fellow researchers who are exploring **TLR agonists** in vaccine development led to fruitful exchanges of ideas. In particular, I was able to connect with a research group from **South Korea**, who are investigating the potential of combining

multiple TLR agonists to create highly effective vaccines. These discussions could lead to collaborative research projects in the near future.

In addition, I met industry professionals from veterinary pharmaceutical companies who were keenly interested in the commercial applications of my work. The practical implications of incorporating **lipoproteins as adjuvants** in commercially available vaccines could revolutionize the way we approach vaccine design for swine populations.

#### **4. Broader Impact on My Research:**

Participating in this conference has significantly broadened my perspective on the future direction of my research. The feedback and questions I received during my Q&A session sparked new ideas on how to further refine the **TLR2 activation assays** and how to explore the effects of different **signal peptide modifications**. The detailed discussions about **cytokine profiling** and **humoral immunity enhancement** have inspired me to expand my research into examining the long-term immune memory responses elicited by these vaccines.

Additionally, the information shared during sessions on **antimicrobial resistance** and the role of vaccines in combating **emerging infectious diseases** provided me with a broader context for understanding how my research fits into the global challenge of maintaining animal health and food security.

---

#### **Acknowledgements:**

I would like to extend my deepest gratitude to my advisor, **Dr. Li-Ting Cheng**, for her unwavering support and mentorship throughout my research journey. Her guidance has been pivotal in shaping the direction of my research and in helping me prepare for this prestigious conference. I also wish to express my sincere thanks to **National Pingtung University of Science and Technology (NPUST)** for their financial support, which enabled me to attend this important event.

A special thank you to **Professor Taisuke Horimoto** for chairing my presentation session and for his invaluable feedback. I am also grateful to the many researchers and industry professionals who took the time to discuss my work and offer their insights.

---

### **Conclusion:**

Attending and presenting at the **4th Joint Meeting of Veterinary Science in East Asia** has been a profoundly rewarding experience. The knowledge I gained, the connections I made, and the feedback I received have all contributed to a deeper understanding of my research and its potential impact on the field of veterinary vaccines. Moving forward, I am excited to apply the insights gained from this conference to refine and expand my research, ultimately contributing to advancements in the development of effective vaccines for swine and other animals.

### **Highlights of Conference**



1. Selfie with President of Japanese Society of Veterinary Science, Hisashi Inokuma.



2. At Conference reception



### Participation Certificate

We confirm your participation in

### the 4<sup>th</sup> Joint Meeting of Veterinary Science in East Asia

September 8<sup>th</sup> (Sun) - 9<sup>th</sup> (Mon), 2024  
at Obihiro University of Agriculture  
and Veterinary Medicine

Hisashi Inokuma

Chairperson of the 4<sup>th</sup> Joint Meeting of Veterinary Science in East Asia  
President, Japanese Society of Veterinary Science

3. Participation Certificate



4. Conference tour with participants from NPUST, Dr. Thu-Dung Doan (Assistant Professor, IAVT), Puji Shandila (PhD, DTAIC) and Angela Jessintya ( PhD, Veterinary Medicine).



公益社団法人日本獣医学会  
The Japanese Society of Veterinary Science

## ***CERTIFICATE of ATTENDANCE***

THIS CERTIFICATE IS PROUDLY PRESENTED TO

**Haroon Afzal**

for an oral presentation entitled "***Signal sequence contributions to the efficacy of PEDV subunit vaccines: mechanistic insights and immunological benefits***" (O1-08\*)  
at the 4th Joint Meeting of Veterinary Science in East Asia,  
September 8th and 9th 2024, Obihiro, Hokkaido, Japan

September 17th, 2024

**Hisashi INOKUMA, DVM, PhD**

Chair, The 4th Joint Meeting of Veterinary Science in East Asia  
President, Japanese Society of Veterinary Science



### 5. Certificate of Oral Presentation.