

# Post-Training Report of the 2024 SPARK Translational Research Bootcamp

Haolan Yang, M.D., DC1 in Medical Sciences, Department of Neurosurgery, University of Tsukuba

I have had the pleasure of participating *the 2024 SPARK Translational Research Bootcamp* held in Taipei from 24-26 June, which was an intense and enriching experience. The main focus of the bootcamp was to train participants to integrate a design thinking approach to translational medicine, to gain an understanding of key concepts involved in the licensing and commercialization of products for unmet medical needs, and to learn strategies for developing an effective pitch. The bootcamp was delivered through a series of lectures and group work, with the pitch presentation as the final session.

#### Day 1: Laying the Foundation

The bootcamp commenced with an opening session and program review, setting the stage for the subsequent days. The first lecture, "Starting with the End in Mind," emphasized the importance of having a clear vision of the desired outcome from the onset. This strategic approach is crucial in guiding the research and development process, ensuring that efforts are aligned with the ultimate goal of successful clinical application.

Following this, the session on Target Product Profile (TPP) and case studies provided practical examples of how to define and utilize TPPs in guiding drug development. The morning concluded with sessions on target identification and validation, highlighting the methodologies used to identify potential therapeutic targets and validate their relevance in disease contexts.

In the afternoon, a case study on medical devices was presented, illustrating the unique challenges and considerations in this field. The lecture on Design Thinking introduced a creative approach to problem-solving, encouraging participants to empathize with users, define problems clearly, and iterate solutions through prototyping and testing. The day concluded with working group sessions, where participants applied these principles in collaborative projects. Our group started with a

brainstorming to determine the subject, which was challenging due to the diverse backgrounds and research fields of our team members. Throughout the discussion, we received extensive professional advice from the mentors. Ultimately, we defined our subject and continued to enrich our conceptual product over the next two days.



#### Day 2: Deepening Knowledge

The second day began with a lecture on translating discoveries, focusing on the transition from academic research to clinical application. The importance of reproducibility in research was emphasized, with discussions on common challenges and strategies to overcome them. Sessions on animal models, pharmacology, and biomarkers provided deeper insights into preclinical development, essential for establishing the efficacy and safety of new therapies.

In the afternoon, the focus shifted to academic drug discovery and the art of pitching. Participants learned how to effectively communicate their research ideas to potential investors and stakeholders. The diagnostics session provided a detailed overview of the development and validation of diagnostic tools, followed by another round of working group sessions.

#### Day 3: From Development to Market

The final day covered clinical development, including trial design and business development strategies. The lecture on clinical trial design highlighted the critical aspects of planning and conducting trials to ensure robust and reliable results. Discussions on business development provided insights into the commercialization process, including how venture capitalists make decisions and what factors are important to them. The session on Taiwan's regulatory environment was particularly valuable for understanding the local context and compliance requirements.

The bootcamp concluded with group pitches, where participants showcased their projects and received feedback from peers and mentors.

### Project of my group: Carpal Tunnel Heat Inducing Bracelet

Our group, Group 7, devised an innovative solution for individuals afflicted with carpal tunnel syndrome (CTS): the Carpal Tunnel Heat Inducing Bracelet. The objective of our project was to address the unmet medical needs of individuals with CTS who are reluctant to undergo invasive therapies and those who experience prolonged recovery periods following surgery. The product comprises a 3D-printed, customizable, breathable brace and a hand-warmer/cooling pad. The brace has been designed to be aesthetically pleasing, washable and breathable, while the pad provides adjustable warmth or cooling without the need for electrical power. With an estimated market size of \$4.69 billion, our product



addresses a significant portion of the population that requires effective and convenient CTS management.

## **Key Learnings and Applications**

- 1. **Strategic Planning**: Emphasizing the importance of starting with a clear end goal and developing a TPP to guide the research and development process.
- 2. **Design Thinking**: Applying creative problem-solving techniques to develop innovative solutions and iterate based on user feedback.
- 3. **Reproducibility and Validation**: Understanding the critical importance of reproducibility in research and the methods to ensure robust and reliable results.
- 4. **Communication and Pitching**: Developing skills to effectively communicate research ideas to stakeholders and investors, a crucial aspect for securing funding and support.

In conclusion, I would like to express my gratitude to my supervisors, Prof. Eiichi Ishikawa and Dr. Alexander Zaboronok, as well as the T-CReDO for providing me with the invaluable opportunity to participate in the SPARK program which was a profoundly enlightening and transformative experience. The knowledge and skills gained will undoubtedly be of benefit in advancing my research projects and career development in the future.