STEPS Students Report

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The subjects of my research

My research theme was "The Study of Zebrafish Behavioral Phenotypes in a Chronic Unpredictable Stress Paradigm". In this research, Zebrafish were exposed to chronic unpredictable stress (ex. bright light, air exposure, noise exposure, etc.) for 38 days. They were exposed to randomly selected stressors in the morning and again in the afternoon each day. During the course of stimulus application, we conducted five types of behavior tests each week to assess their behavioral phenotypes in terms of not only their anxiety but also other behavior endpoints such as their social behavior or learning. It was expected that their anxiety level would increase as the period of stress exposure got longer and that this system worked similar to the model of depression. We focused on whether chronic unpredictable stress exposure increased their anxiety, and if it did, how other observed parameters changed accordingly.

My achievements in the research

Detailed analysis of results is still being conducted, however we have completed preliminary analysis.

First, the novel tank test we conducted was established to be a useful and reliable experiment paradigm. There was an obvious difference between control and stressed fish and in stressed fish the level of anxiety increased between each trial.

Next, we used a new a behavior test in this research and the methodology proved to be sound. The "immobilization test" was shown to be an effective analogue to the tail suspension test in rodents. In rodents, this test is conducted by suspending rodents' tails and measuring movement. It is assumed that if they stop moving sooner, their tendency towards depression is stronger. The laboratory had attempted to apply this test for the last year and was finally able to create an effective protocol that allowed for the study of zebrafish behavior that can be related to a despair-like behavior.

These achievements are going to be published under the title THE DYNAMICS OF COMPLEX BEHAVIORAL PHENOTYPE EVOKED IN ZEBRAFISH AFTER CHRONIC UNPREDICTABLE STRESS EXPOSURE and TAIL IMMOBILIZATION TEST AS A WAY TO ACCESS ANXIETY AND STRESS RELATED BEHAVIOR IN ZEBRAFISH at the 26th International "Stress and Behavior" Neuroscience and Biopsychiatry Conference.

My life in St. Petersburg

My colleagues were very kind and helped me not only with research but also with my daily life. I enjoyed St. Petersburg's history, culture and art and was able to experience things like at trip to The Hermitage Museum and a ballet at the Mariinsky Theatre, and I had many chances to talk with SPbU students as well as students from other countries in my dormitory.

What this program brought me

This program gave me a wider view on research around the world and helped me gain the courage to travel to other parts of the world for both cultural and academic exchange. I am working on neuroscience using mice in my laboratory and I am interested in the biological basis of emotion. Zebrafish was a novel model animal for me and it was very fascinating that depression-like behavior can be seen in fish.

This was the first time I went abroad on my own, and I was able to stay there for a whole month. I sometimes felt isolated because there were no Japanese speakers around me and I had some trouble navigating while I was on my own, but I made it back to Japan without incident. After this experience, I would definitely like another opportunity to travel and study abroad.

Picture 1　My host professor and colleagues

Picture 2 The building where I researched