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（For JSPS Fellow）

Form B-2
(FY2018)

Date（日付）
20/12/2018 （Date/Month/Year：日/月/年）

Activity Report -Science Dialogue Program-
（サイエンス・ダイアログ事業 実施報告書）

- Fellow's name（講師氏名）: Chih-Yang Chen （ID No. P18105 ）

- Participating school（学校名）: Nagoya-City Koyo Senior High School

- Date （実施日時）: 14/12/2018 （Date/Month/Year:日/月/年）

- Lecture title（講演題目）: Sensory-motor processing

- Name and title of your companying person（講義補助者 職・氏名）

- Lecture format（講演形式）:
  ◆Lecture time（講演時間） 40 min（分）, Q&A time（質疑応答時間） 20 min（分）
  ◆Lecture style（ex.: used projector, conducted experiments）
  （講演方法（例：プロジェクター使用による講演、実験・実習の有無など））
  Powerpoint presentation; used projector

- Lecture summary（講演概要）: Please summary your lecture 200-500 words.

Sensory-motor processing is one of the most important question in neuroscience. We use our sensory system, including vision, auditory, olfactory, tactile, and taste, to gather information around us. We then make actions base on what we perceived. One simple example could be if you are in front of a car and it is going fast toward you. After seeing it coming and probably hearing the loud horn, you will immediately jump away to escape from the current situation. In this very short period of time, the largest "black box" in your body, the brain, received sensory information, made immediate decisions, and moved your body and legs in the correct way. This seemed very simple and fast processes in the brain actually requires all the steps to be accurate and precise, otherwise, you will get hurt. I am fascinated by the complexity and accuracy of these simple processes and decided to pursue this question.

In order to understand how the brain functions during sensory to motor transformation, I decided to start with the sensory side. One proxy would be the eyes, because we say the eyes are the window of our soul. So I started to do research in rabbit's retina when I was still a bachelor student in Taiwan. I found developing retinal neurons express specific proteins to help themselves organizing and communicating to others even when baby rabbits are not born. This was an exciting moment for me because I realized the neurons are understandable and can be systematically studied. I also learned many techniques during this period.

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During my master period, I decided to study another type of sensory modality, the tactile sensation, but more to the extreme, pain. I found the potential mechanism of how injured pain-sensing neurons make wrong connections to other sensory neurons and eventually develop into chronic pain in rat. This was very important finding for me because I noticed the neurons that are not relevant to each other can be linked after proper repetitive stimulation.
Later, I decided to go abroad to Germany for my PhD degree because I found a lab there working on how movements change sensations in macaque monkeys; to be more specific, how eye movements change visual perception. This is almost exactly the question I wanted to pursue, but interestingly in the opposite direction. Over there, I found even the tiniest eye movements can cause dramatic enhancement or inhibition in visual perception. It really broaden my point of view because I learned not only sensory to motor processing is important, but every movement can also change how we perceive and process sensory information.
After graduation, I started to work here in Japan as a Post-doctoral fellow in June, 2017. I decided to come to Prof. Tadashi Isa's lab because he is an expert in sensory-motor processing, especially in vision to eye movements. I am now working with a type of small monkey, the marmosets, and try to understand how they perceive visual information and move their eyes to what they are interested in. This is a great opportunity for me because I can use what I have learned to answer how sensory-motor processing is achieved in the great lab of Prof. Isa.
In my presentation, I will talk about why I decided to become a neuroscientist and my experiences in research and life in my home county, Taiwan, and the country I received my PhD degree, Germany.

- Overall advice or comments to future participants in the program（今後の講師へのアドバイス）:
It was a great opportunity to be able to present my work to high school students. It not just gave me the opportunity to review my work, also provided a perfect stage for young researchers like me to present our work.

- Other noteworthy information（その他特筆すべき事項）:

- Impressions and comments from the accompanying person（講義補助者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。）