

(For JSPS Fellow)

Form B-2  
(FY2018)

Date (日付)  
31/07/2018 (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): Agustinus Robert Uria (ID No. P17114)
  - Participating school (学校名): Hokkaido Noboribetsu Akebi Secondary School
  - Date (実施日時): 19/07/2018 (Date/Month/Year: 日/月/年)
  - Lecture title (講演題目): What inspired me to pursue a career in Science?
  - Name and title of your accompanying person (講義補助者 職・氏名)
- 

- Lecture format (講演形式):
    - ◆Lecture time (講演時間) 70 min (分), Q&A time (質疑応答時間) 10 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))
- 

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

I begun my first 35-minute lecture with a brief introduction about Indonesia, the country where I come from. Then I more specifically talked about the nature and the amazing biodiversity in Central Sulawesi, where I grew up and spent my childhood. At the second 35-minute talk, I talked about my personal story in study and research. This is intended to inspire and motivate students to pursue a career in Science. Below is the summary of my lecture:

Indonesia is the 4th most populous country. There are 17,508 islands in Indonesia, including 9 main islands. The capital is Jakarta located in Java Island. It consist of more that 500 native ethnics with at least 731 distinct languages and 1,100 different dialects. Taman Mini Indonesia Indah (TMII) or "Beautiful Indonesia Miniature Park" located in Jakarta is a popular culture-based recreational area, which represents almost all diverse cultures in Indonesia. Indonesia is well known for Komodo dragons, elephants, orangutans and tigers. Central Sulawesi where I grew up is particularly famous with many endemic animals that can be found in Lore Lindu National Park. Back to the 19th century, Alfred Russel Wallace, a British naturalist, initially found that 64% of mammals in Sulawesi were endemic that are not found elsewhere in the world. Based on his ecological observation, he came to conclusion that Sulawesi was located on some sort of

boundary line that separated Asia continent from Australia continent. Due the boundary line, Sulawesi animals had been isolated from other species for a very long time, and therefore slowly evolved into new species. This prompted Darwin to publish the very famous book "On the Origin of Species". Central Sulawesi is also popular for its unparalleled beautiful lake, called Poso Lake, with more than 11 endemic fishes, including new species of eels (Unagi). Togian Islands are located in Tomini bay, which are well known for its very beautiful coral reefs and highly diverse invertebrates, such as sponges. I grew up around Tomini bay where I can easily see the beauty of coral reefs along the the beach. I was impressed with so many unique creatures in coral reefs, including different colors of coral fishes. These underwater beauty and uniqueness have inspired and encouraged me to pursue undergraduate study in the area related to marine.

With supports from my parents, I studied Marine Science at Sam Ratulangi University, Manado. At the end of my bachelor study, I carried out a thesis research about marine thermophilic bacteria. Thermophilic means "heat-loving"; and thus thermophilic bacteria can be defined as bacteria able to grow well at high temperatures (above 40 °C). To learn more about thermophilic bacteria, I moved to Bogor Agricultural University (IPB) where I did research on protease (proteolytic enzymes) from thermophilic bacteria. Proteases are hydrolytic enzymes that degrade proteins. In cheese production, protease is added to milk to degrade caseins, a sort of proteins contained in milk. Then I pursued a master study in Biotechnology at Wageningen University, Netherlands, where I conducted a short thesis research about alcohol dehydrogenase (ADH) from hyperthermophilic archaea. Archaea differ from bacteria in the composition of the cell membrane lipids, allowing them to live in extreme environments, such as at boiling temperature of water. ADH belongs to oxidoreductase family, and catalyze the conversion of primary alcohols into aldehydes or secondary alcohols into ketones. ADH has found a broad range of applications including improving flavor and arome in the beer industry.

Upon my master graduation, I returned to Indonesia and worked at a R&D center under the Indonesian Ministry of Marine Affairs and Fisheries, where I explored bacteria living inside marine sponges for the production of chitinase enzyme. This enzyme has found applications in medicine and agriculture. What is marine sponge? It is a very simple marine animal that is unable to move on its own. The movie cartoon character of "SpongeBob" is inspired by this unique sea creature. In movie, SpongeBob has huge pore, boneless, and moving vast. But the sponge lifestyle in reality is quite different. One of many interesting facts about sponges that they contain toxins to prevent being eaten by fish. These sponge toxins can be developed as drugs especially antitumor medicines. Interestingly, many of such toxins are actually made by bacteria living inside sponges, not by the sponges. This interesting phenomenon and fact about sponge had motivated me to explore more about how "these talented" bacteria make these toxins. This scientific curocity had brought me to University of Bonn for doctoral research and then ETH Zurich for postdoctoral research. I especially used technique called "Metagenomics" to search genes that code for the production of sponge toxins. What is metagenomics? This term is related to other common terms in Molecular Biology, such as gene, DNA, genome, chormosome. With the support of JSPS, I got a great opportunity to continue exploring bacteria living in marine sponges.

Based on my personal journey in study, research, and science, I take general conclusion that nature (unique phenomena in nature), our figures (support from parents, teachers, mentors/ supervisors/ advisers), and public figures (well-known scientists) can inspire us to pursue career in Science. Some activities that can get and stay inspired in science include reading science history/popular scientific news, visiting science museum, sightseeing nature and observing something unique, talking or dialogue with public figures who are well known in science.

- Overall advice or comments to future participants in the program (今後の講師へのアドバイス):

- 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。)

The school is an international/global secondary school, in which the language of instruction used for study is English. Therefore, I did not bring an accompanying person to translate the talk in English into Japanese.