

October 2020



FGL community NEWSLETTER

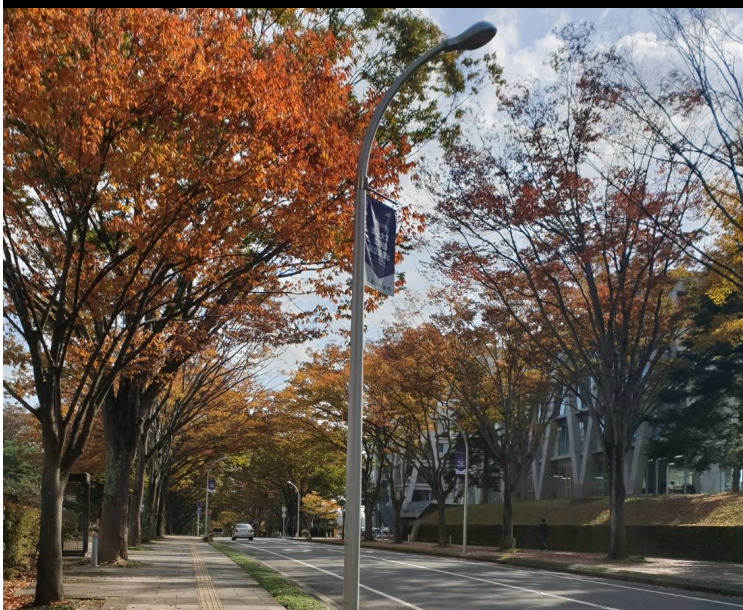
WELCOME TO TOHOKU

A very warm welcome to all our first years from the FGL family. Congratulations on your acceptance to the Tohoku University! Wonderful days await you. We hope that we can make you as comfortable as possible, even with the given current situation. Our arms and hearts are always open to all of you, so do not be afraid to reach out to us!

This may be your first newsletter, so please find the link below to the previous ones and have a read. Find out what your seniors and alumni are and were up to.

INTRO

We have now reached the season of 「紅葉」 or “Autumn Leaves”. Chilly weather—perfect for a hot cuppa and snuggling in a blanket. But chop-chop it is! We have the beginning of a new semester and for some of you, it’s your very first semester!



Aobayama Campus taken by Sarika

Research
From AMB 2

Research
From AMC 3

Interview
Of IMAC Alumni 4

CORONAVIRUS
INFORMATION 5

UNIVERSITY SITUATION

According to the BCP Guidelines of Tohoku university, we are currently sitting on level 1, which means that some classes will be held online and some facilities will face partial restriction. However, Tohoku University is looking to resume activities as soon as possible, which will enable more and more extracurricular activities for us to enjoy under basic social-distancing rules. In this link you can find the information about the BCP level used,

http://www.tohoku.ac.jp/en/news/images/BCP_20200908.pdf



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Written & Edited by Sarika / Neo



RESEARCH TOPICS OF 4TH YEAR STUDENTS

Studies on the spreading factor of Anthropogenic invasive species

Eden Wagner-Muns From AMB

Since the dawn of agriculture, humans have shaped their environment to better fit their needs- terracing, flooding, and burning land to change its capabilities. It is only recently, however, that we have come to understand how much we affect our environment even without meaning to.

Anthropogenic invasive species are an increasing issue on a global scale. Some species may be introduced on purpose, but most end up transported to new habitats by accident; and many of these species cause lasting, and often negative, effects on the local ecosystems. In the case of the polychaetes —marine segmented worms—it is only in recent decades that we have come to recognize the extent and effects of the increasing spread of potentially harmful species.

Elkhorn, a tidal mudflat in southern California, hosts a number of these polychaetes, most notably two related species within the family Spionidae: *Boccardia proboscidea*, a mud-burrowing worm, and *Polydora hoplura*, a shell-boring worm. Both species are well known for their parasitic relationships with commercially important molluscs. Mud blisters and weakened shells are both potential results of an infestation, making understanding and controlling their spread important to both ecosystem and economic health.

B. proboscidea and *P. hoplura* are thought to spread through the transport of their host bivalves. In our recent study, we investigated the differing ecology and genetics of both species, looking at body sizes and the 16S ribosomal RNA site to determine differences in global populations and to infer how each species might have spread across the oceans. Results found *B. proboscidea* populations have low differentiation, but that southern California may be their original range due to the relative genetic diversity found at Elkhorn. This divide is reinforced by distinct morphologies observed between Elkhorn samples and samples from Sasuhama, Japan. *P. hoplura* was found to display two distinct genetic clusters, with notably samples taken from southern Japan and samples taken from western Japan being the most distantly related. This may imply their spread more heavily relies on humans due to an inability to spread on their own.

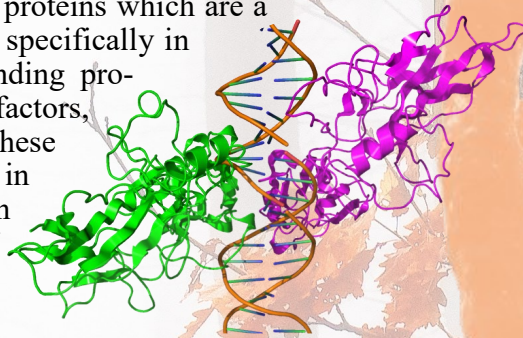


DNA Garden

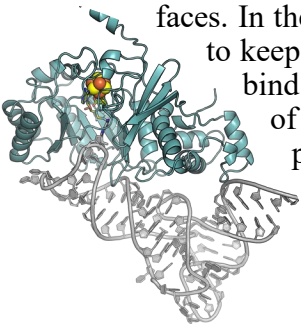
Yining Wu From AMC

Thinking about DNA or protein, unlike things we can directly feel using our 5 senses in our daily life, what comes to mind is usually abstract concepts or ideal structures. Then what about 'DNA Garden'? You must be imagining what a 'DNA Garden' looks like by making an association with a real garden. It's actually a technique developed in our lab that enables the visualization of tethered DNA assays with proteins bound at single-molecule level, giving you a 'concrete' image of 'DNA garden' by fluorescent microscope.

Our lab focuses on DNA-binding proteins which are a type of proteins that attach to DNA specifically in living cells. Examples of DNA-binding proteins include DNA transcription factors, DNA polymerases and nucleases. These proteins are known to be involved in the processes such as transcription and cell signaling. The binding of DNA-binding protein to a specific DNA sequence usually initiates the downstream protein-DNA reactions and thus is critical for cells to function normally. Inhibitions in specific binding of DNA-binding proteins can result in diseases such as cancer and diabetes. Therefore, we aim to elucidate the binding dynamics of DNA-binding proteins. To analyze protein dynamics on DNA, developing a technique which visualizes the movements of DNA-binding proteins on DNA is straightforward.



In a 'DNA-Garden' experiment, by using biotin-avidin interactions, DNAs can be fixed in designed patterns from PDMS (Polydimethylsiloxane) stamps in a flow cell. In addition, absorption of proteins and DNA to the glass surface is reduced by MPC (Methacryloyloxyethyl phosphorylcholine) coating on glass surfaces. In the imaging process, the buffer flow allows DNAs to keep in a stretched state when DNA-binding proteins bind on DNA. This helps us observe the movements of proteins on straight DNA clearly. Since the experiment is at single-molecule level, position data collection of each protein on DNA is further analyzed in a statistical method to obtain the binding dynamics.



'DNA Garden' technique provides an efficient way for observing protein dynamics on DNA, nevertheless, there are still some limitations. The major one is that, in living cells, DNA are not always straight but in curved and irregular shapes. Also, other proteins like histones on DNA may affect the specific binding of DNA-binding proteins. These drawbacks can be improved by applying different experimental strategies and this may become one of our future research interests.

IMAC-U ALUMNI INTERVIEW



Can you please introduce yourself to the reader?

Hello, my name is Reyhan Daffa Athariq. You can call me Rey for short. I am from Indonesia and am Indonesian but spent around 7 years in Malaysia during elementary-junior high, so feel free to reach out if you are interested in any of those two.

I was in IMAC-U program 2015-2019, now I am in IMAC-G program under the same laboratory affiliation of Laboratory of Solid-State Ionic Devices; Amezawa-Nakamura Laboratory. Our lab is focused on works concerning electrochemical materials, such as batteries and fuel cells, and is more focused on experimental with a bit of simulations.

It's probably not the typical mechanical engineering laboratory, where people are more focused on robots and airplanes, but I hope it can give a slight impression how broad the mechanical engineering field can be :) oh and my lab is at Katahira. My hobbies on free time are photography, tinkering with electronic devices, cooking, basketball, and my favorite, sleeping.

How was your experience in Sendai- both academically and socially/ outside academic life?

I personally love the Sendai city. The city is not as crowded as Tokyo, which makes it feel cleaner and more convenient, while at the same time it is not too small and has pretty much everything you need. I personally prefer cycling for transport, and because there are not many cars and people, not to mention there are many trees around Sendai (Sendai is not called City of Trees for no reason), it is really convenient to ride a bike here.



Reyhan Daffa Athariq
From Indonesia
IMAC-U & IMAC-G Senior

There is not much going on around here, but for me it makes it easier to focus on the studies. That doesn't mean there is nothing going on in Sendai though, there is the yearly Tanabata matsuri and other events that would make your stay here worth it. About social life, to be honest I am not a social butterfly, and I only communicate with the same usual friends (thankfully, Sendai is quite small, so there is quite the chance of bumping into the same people on a stroll around Sendai station). But my suggestion if you are interested in making many friends, you should learn and practice some Japanese language, as I am sure many people are interested in making friends with foreigners and in knowing more about foreign culture. It's just there is a language barrier which stops them, because the people in Sendai does not face international tourists as often as Osaka or Tokyo, which makes English not that urgent.

IMAC-U ALUMNI INTERVIEW



Kawauchi Campus taken by weiwei

What do you think about the Corona Pandemic?

I am not a healthcare expert or anything, so I am not sure on how I should answer that... However, what I know is that it is indeed a bad pandemic as what we can see in the world today. I am just repeating announcements, but please follow the safety guidelines and don't take this pandemic lightly. Recently, people has been underestimating the virus and are not wearing masks or simply loiter around the city without prevention measures, which could possibly cause worse problems than now. I remember someone said, "The disease itself might not be lethal, but it's sad that it is actually something that could be easily prevented by a simple action, and yet people are ignoring." I could go on again and again, but you get the message. Listen to the experts, they know what they are doing.

Written & Edited by Carlos Baptista

What would you say is the most important thing to keep in mind when facing a challenge?

Well, I think that is a pretty broad question, as 'challenge' could mean a lot... I would say, "Just do it", like in Nike's catchphrase, haha (this is not sponsored, unfortunately). You can learn more by doing, and when you fail, keep in mind that you can learn more from the failure rather from a success, and then work on how to improve (I'm not saying that you should fail on purpose, though...). If you succeed, then that's another achievement for you. The only time when you return empty handed from a challenge is only when you don't face it.

What kind of advice would you give to your juniors?

I think I am not the best person for this, but you can always learn something from someone, I guess? Study hard, but don't forget to keep in touch with your friends and family and have some fun. Investing in your future is of course great, but a future with no close people would probably be no fun. At the same time, don't play too hard and forget to study, you still have a future... Also, take care of your physical and mental health, as studying abroad might be quite the challenge and in addition bad health disturbs your study.

CORONAVIRUS INFORMATION

How is the Situation?

Currently, corona-virus infections are occurring one after another in places like bars and restaurants, mainly among young people.

In September, the number of newly infected people per month in the Sendai city rose rapidly. As of the 15th, the number reached 65, surpassing the 60 in April, which was the "first wave" of the spread of the infection. It is estimated that 27 out of 65 people, 40% of them, were infected at restaurants.

There is an app called COVID-19 Contact-Confirming Application which enables you to receive notifications about the possibility of contact with someone infected with the novel coronavirus.

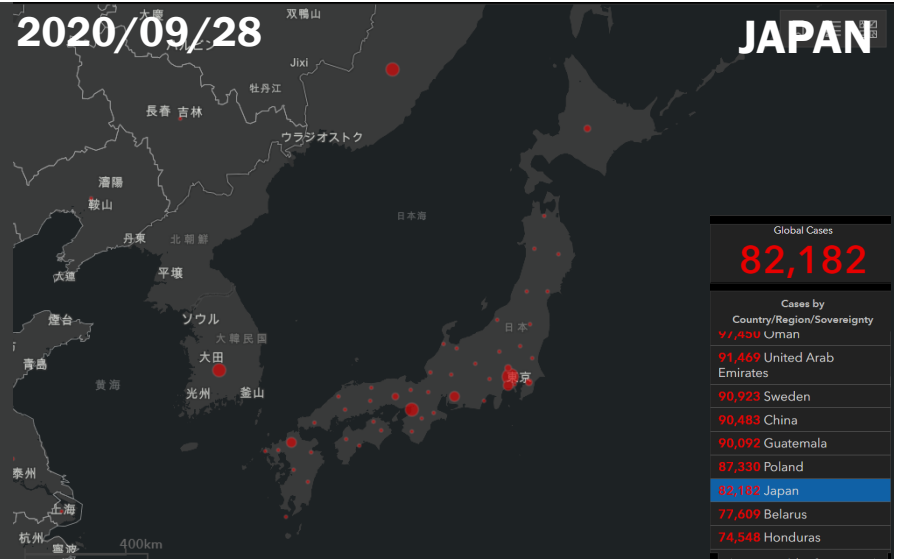
We the FGL community sincerely hope you and your family are all doing well during the pandemic, STAY SAFE!

COMIC

We bring to you our very own comic! You can find it in the next PDF following the newsletter.

We hope you have a good time reading it.

2020/09/28



TRAVEL BUBBLE

Right now, only certain people from some countries in Southeast Asia are allowed to fly to Japan under special procedures (Travel Bubble.) For the constant update on the situation, we encourage you to check Tohoku University's official sites for CoVID-19-related information: http://www.tohoku.ac.jp/en/news/university_news/information_of_covid_19.html

This site contains multiple links to several official websites that you can find the information from. Stay safe, and we hope to see you in Japan soon.



Epilogue

Again, thank you, the readers, for being our motivation. I hope you enjoy the upcoming semester, despite these trying times. For the freshmen, welcome to Tohoku University, and for all students who are abroad, we are more than excited to welcome you back to Japan soon.

If you have some questions, or want to connect to our family, please take a look at our Social network profiles:

<https://www.facebook.com/TUFGLCommunity/>

https://www.instagram.com/fgl_community_tu/



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Written & Edited by Yize / Neo / Sarika