

The 2021 Multiomics and Precision Medicine Joint Conference (2021MOPM) 体験報告

日本遺伝学会では台湾・日本間の学生の相互交流の一環として、2014年度から Taiwan Society of Evolution and Computational Biology (TSECB) が毎年開催する International Symposium on Evolutionary Genomics and Bioinformatics (ISEGB) に学生2名を選考し、派遣して参りました。2018年度から、派遣された学生から日本遺伝学会に提出いただいた報告書を GSJ コミュニケーションズに派遣体験記として掲載しております。2021年はコロナ禍のため ISEGB は開催されませんでした。その代わりに、TSECB を含む台湾の6つの学会が共催の Multiomics and Precision Medicine Joint Conference (MOPM) が昨年11月13-14日にオンラインで開催され、聴講した日本遺伝学会の学生3名にその様子を報告いただきました。今後も台湾で開催される関連学会に参加する学生を公募する予定ですので、皆さん、この体験記を参考にふるって応募ください。

企画集會幹事 Jeffrey Fawcett

2021 Multiomics and Precision Medicine (MOPM) Joint Conference Report

Beverly Ann G. Boyboy (D1)

Academic Adviser: Dr. Kenji Ichiyanagi
Nagoya University

The opportunity to attend the 2021 MOPM conference gave me new insights and learnings about the state-of-the-art scientific studies and methods that potentially fill the gaps of unknown molecular biology mechanisms and interactions. The different topics presented such as cancer therapy, antibody-drug development, single-cell proteomics, and studying the mechanistic basis of diseases using non-conventional molecular biology vectors or biomolecules were all promising and revolutionary especially in the biomedical research field. For example, the early detection of Parkinson's disease using microRNAs as biomarkers may potentially save patients from this neurodegenerative disease or that new neurological drugs may be developed in the future.

New methods or strategies that potentially cure specific types of cancer were presented in the study. For example, one study presented focused on cancer therapy using antibodies. This learning was new for me since it is a non-conventional method of diagnosing or treating cancer unlike established methods such as chemotherapy, cancer genomics, gene editing, etc. The study reported that therapeutic antibodies can exhibit anti-tumor effects, can act as immune checkpoint inhibitors and has a promising high survival rate for patients.

Some studies used a multi-omics approach in the diagnosis and treatment of diseases like cancer and neurodegenerative diseases like Parkinson's disease and Alzheimer's disease, while other studies focused on exosomal research and targeted therapy. Despite the complexity of integrating different -omics fields like genomics, transcriptomics, proteomics, etc., their results enable more precise and increased diagnostic yield in medicine and public health, as well as a greater understanding of the biological processes behind different diseases. Their experimental design promises higher specificity of their targets and thus the term precision medicine.

2021MOPM レポート

Hao-Wen Hsiao

Tokyo Metropolitan Institute of Medical Science

I was very honored to have this golden opportunity to attend the symposium of 2021MOPM. I am very interested in how omics technology resolves fascinating biological questions. First, I was impressed by the talk delivered by Dr. Shih-Yu Chen. He reported a systemic profiling in tumor-infiltrating CD8⁺ T cells from various perspectives, such as DNA replication program, DNA damages, chromatin modifications, and even transcription. I also had some questions regarding DNA replication in T cells in the Q&A section for Dr. Chen as my doctoral thesis is focused on replication. He did think DNA replication is dysregulated but this hypothesis has not yet been validated. Another focus of his research aims to harness mass cytometry (CyTOF) technology to map over 50 receptors/molecules in a row in immune cells at single-cell level. This enables high dimensional analysis in cells/

tissues with low cell numbers for subsequent immunologic studies and cancer clinical trials. I am now working on how DNA replication is regulated during T cell differentiation. CyTOF could be a helpful tool to identify target molecules of replication in T cells at single-cell level.

Another talk that inspired me is the one by Professor Ruby Yun-Ju Huang. She is an expert in epithelial-mesenchymal transition (EMT), a key process for tumor cell progression and metastasis. She found out that, in EMT spectrum, different stages of EMT were accompanied with different histone modifications and chromatin state. This drives differential gene expression in each EMT stage, affecting how tumor cells progress and metastasize. This result defines the molecular characteristics in cancer cells in EMT spectrum, especially from the chromatin and histone perspective. One of my current work is to examine chromatin state in immune cells and cancer cells. Prof. Huang's results provide an example for me to follow.

Overall, 2021MOPM broadened my horizons and made me think about some possible tools that could be exploited in my research. I hope there will be another chance to attend this meeting on site and talk to these professors face-to-face in the near future and gain critical opinions from them.

2021 MOPM 参加レポート

埼玉大学大学院理工学研究科
博士後期課程2年
塚田耕太郎
2021年11月14日

2021年11月13日（土）および14日（日）に、台湾で開催された The 2021 Multiomics and Precision Medicine Joint Conference（2021 MOPM）に、日本人学生招待枠として参加させていただきました。演題内容は Precision Medicine に関連するものが主であり、それらに加えて Single Cell Multiomics, Genomics, Bioinformatics など、幅広い分野の最新の研究発表も聞くことができました。特に印象的だったのは、10x Genomics 社の Leo Chan 博士の講演でした。当講演で Leo Chan 博士は、10x Genomics 社が開発した TEA-seq についての発表を行っていました。TEA-seq とは、Single cell の transcriptome, protein level, さらには chromatin accessibility を測定する技術で、Single cell の解析技術の中でも一段と目を引くものでした。このような、最新の技術や研究成果を数多く学ぶことができ、とても貴重な体験をさせていただきました。大会運営については、座長が演者の紹介を行った後、あらかじめ収録した発表を流し、質疑応答だけをオンタイムで行う方式でした。そのため、接続トラブルや時間超過もほとんどなく、スムーズに行われました。このような形式は初めての経験でしたが、オンライン開催ではこちらの方が滞りなく進行するので良いと思いました。

最後になりますが、今回の 2021 MOPM に招待していただいた Jeffrey Fawcett 先生、推薦していただいた日本遺伝学会に感謝申し上げます。ありがとうございました。