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#### 1. Genomes without limits?

If you ever wondered if there are any limits in science, this is just another proof that -- possibly not. It has been believed that breaking the record large genome of Paris japonica at 148.89 Gbp would be an impossible task until recent discovery of Tmepsipteris oblaceocelata, which has a giant genome size of 160.45 Gbp. For comparison, this genome is about 50 times larger than the human genome, and about 1,190 times bigger than that of the average Arabidopsis thaliana genome (135 Mbp)! T. oblaceocelata is a small fern that grows only 5-10 cm tall, which is exclusively found in the region of New Caledonia.

Read more: Oriane Hidalgo and Jaume Pellicer et al., A 160 Gbp fork fern genome shatters size record for eukaryotes. iScience (2024). DOI: 10.1016/j.isci.2024.109889

# 2. Summer Science School (SSS) 2024 for High School Students

An annual program for high school students interested in science will be held in Kurashiki Campus of the Institute of Plant Science and Resources (IPSR). Date and time: Thursday, August 1, 2024 9:30-17:00 Location: Okayama University IPSR, Kurashiki Target: High school students (any grade) Capacity: 27 people (if there are many applicants, a lottery will be held) Participation fee: Free Application period: Monday, July 1, 2024 to Friday, July 5, 2024 [Details and application website]: https://www.rib.okayama-u.ac.jp/SSS/

### 3. Brief paper highlight

This topic seems just right for the upcoming hot summer months in Japan. In the recently published article in Nature, temperature sensing mechanisms in plants have been revealed for the first time. It appears that temperature sensor TWA1 is essential for temperature sensing involved in the basal and acquired thermotolerance in Arabidopis thaliana. The sensor function of TWA1 depends on

the highly variable region (HVR) and temperature-induced rearrangements in the protein that control the affinity for binding to JAM2 and other repressor proteins. TWA1 is likely to orchestrate the acclimation responses by integrating temperature with ABA and JA signaling. According to authors, "TWA1 and its orthologues provide prototypes for engineering temperature switches in the emerging field of thermogenetics".

Read more: Bohn, L., Huang, J., Weidig, S. et al. The temperature sensor TWA1 is required for thermotolerance in Arabidopsis. Nature 629, 1126-1132 (2024). https://doi.org/10.1038/s41586-024-07424-x

### 4. Joint research introductions = 105th series =

Wajeeha Shamsi, Swiss Federal Research Institute WSL, Switzerland

In the spring of 2017, I got a surprise call from my co-supervisor, even though we hadn't planned to meet. I felt nervous, wondering why he wanted to see me. My mind raced with questions: What could it be about? Had I done something wrong? As I entered his office, my apprehension was met with a surprising proposition: he urged me to apply for a six-month research scholarship in Japan through the International Research Support Initiative Program (IRSIP), sponsored by our country's Higher Education Commission.

While the idea had crossed my mind before, I hadn't anticipated pursuing it so soon. Moreover, as a single mother to a seven-year-old son at the time, the decision weighed heavily on me. Balancing personal responsibilities with academic pursuits posed a challenge. Yet, after careful consideration, I made the bold choice to leave my son in the care of my mother and embark on this academic journey alone.

Thankfully, Suzuki Sensei graciously accepted my request, and in the autumn of 2017, I found myself at IPSR, a renowned laboratory specializing in Mycovirology, guided by Prof. Nobuhiro Suzuki, a distinguished figure in the field. I was overwhelmed to see the state-of-the-art PMI lab that provided an ideal environment for exploration, equipped with everything necessary to conduct ground breaking studies. The environment at IPSR and PMI lab was quite international and I never faced any language barrier. The lab members were friendly and cooperative and I learned so many things that boosted my confidence as a researcher.

Participating in events such as the Kenya-Africa Day and weekly seminars not only enriched my academic experience but also honed my presentation skills. By the end of my stay, I had grown both personally and professionally.

When I came back to Pakistan in 2018, I kept thinking about Japan and the PMI lab. Even though I was far away, I still missed the exciting research atmosphere there. And it wasn't just the research - I also missed Japanese food and how beautiful Japan was.

In a twist of fate, in 2020, I secured a postdoctoral position at the Swiss Federal Research Institute, coincidentally where Prof. Suzuki had a collaboration. Once again, I found myself invited to the PMI lab, this time in autumn 2023. Though brief, my return allowed me to revisit the past, conducting planned experiments, reconnecting with old friends, and indulging in the pleasure of enjoying sushi once again.

Finally, I would like to express my gratitude to everyone at IPSR and PMI. I truly believe that my time at IPSR greatly contributed to my growth as a researcher.

#### 5. Recently released publications

Katsuhara, M. 2024 awards in the journal of plant research. Journal of Plant Research, 10.1007/s10265-024-01549-w (2024) Doi.org/10.1007/s10265-024-01549-w

Huang, H., Yamaji, N., Ma, J.F. Tissue-specific deposition, speciation and transport of antimony in rice. Plant Physiology, kiae289 (2024) Doi.org/10.1093/plphys/kiae289

Takagi, H., Lee, N., Hempton, A.K., Purushwani, S., Notaguchi, M., Yamauchi, K., Shirai, K., Kawakatsu, Y., Uehara, S., Albers, W.G., Downing, B.L.R., Ito, S., Suzuki, T., Matsuura, T., Mori, I.C., Mitsuda, N., Kurihara, D., Matsushita, T., Song, Y.H., Sato, Y., Nomoto, M., Tada, Y., Hanada, K., Cuperus, J.T., Queitsch, C., Imaizumi, T. Florigen-producing cells express FPF1-LIKE PROTEIN 1 that accelerates flowering and stem growth in long days with sunlight red/far-red ratio in Arabidopsis. bioRxiv: the preprint server for biology, 2024.04.26.591289 (2024) Doi.org/10.1101/2024.04.26.591289

Taketa, S., Kim, J., Takahashi, H., Yajima, S., Koshiishi, Y., Sotome, T., Kato, T., Mochida, K. Genomic traces of Japanese malting barley breeding in two modern high-quality cultivars, 'Sukai Golden' and 'Sachiho Golden'. Breeding Science, 73(5):435-444 (2023) Doi.org/10.1270/jsbbs.23031

# 6. Posting request

We constantly encourage all PSSNet subscribers to contribute information about their latest publications, meetings and seminars, staff, postdoc, and student recruitments, etc. Please send your information to [ <u>pssnet-admin@okayama-u.ac.jp</u>] E-mail address. You can also distribute your information via mailing list of the PSSNet.

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