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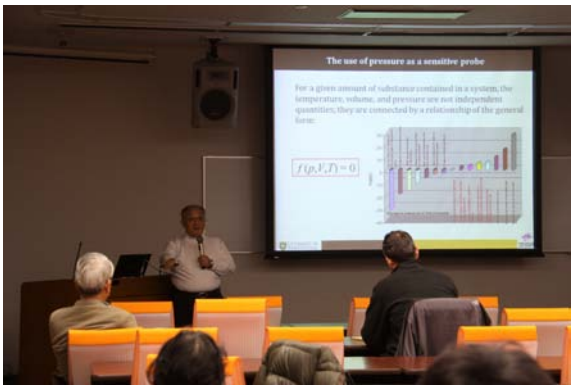
Contents

News

Fifth University Research Administrator (URA) International Research Seminar

January 12, 2016

Professor John Tse from the University of Saskatchewan. Canada, presented a talk entitled "Working Under Stress" at the 5th URA International Research Seminar giving a wide ranging review of his recent research on using high pressure to promote new and innovative properties in materials.



Professor TSE giving a talk to researchers and students of Okayama University

Using examples of his recent research on experimental and theoretical studies, he demonstrated how the properties of simple molecular radicals can be tuned from insulating paramagnets to metals and even to Fermi liquids, and finally illustrated the synergy between advanced electronic structure calculations and experiments.

Professor Tse's research focuses on the rationalization of the fundamental principles governing the structure, stability and thermodynamics of materials and predicting the behaviour of materials.


Professor TSE answering questions from the audience

He has received many prestigious awards in his distinguished career. In Japan he received the Foreign Visiting Scholar from MITI, for his stay at the Hokkaido National Industrial Research Institute in 1995. Also, he awarded the JSPS (Japan) Senior Fellowship in 1999 and 2006. Currently, Professor Tse is a Collaborative Researcher at RIKEN.

His connections with Okayama University date back to collaborations with the group of Professor Tanaka Hideki at the beginning of 2000's and later with Professor Kubozono Yoshihiro.

Further information

Bernard CHENEVIER, Senior URA, Okayama University / Director of Research, CNRS

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News

Okayama University Silicon Valley Office (OUSVO) is officially opened at Fremont, California in November, 2015

December 07, 2015

The opening events of OUSVO were held on November 13th, 2015 at San Jose Fairmont. The events consisted of the official ceremony, a reception and symposiums including cybersecurity & big data, and medical device global development.

Okayama University President Morita delivers an address at the opening ceremony

Large crowds of nearly 200 attendees gathered at San Jose Fairmont, including many prestigious guests: Prof. Susan W. Martin, president of San Jose State University, Mr. Jun Yamada, Consul-General from the Consulate General of Japan in San Francisco, Mr. Raul Peralez, Council Member of the city of San Jose, and Mr. Shuji Yamamoto, Director of the Economic Department of the city of Okayama. Prof. Kiyoshi Morita, the President, Prof. Shin-ichi Yamamoto, Executive member of the Board, Prof. Yoko Yamamoto, Director of the Center for Global Partnerships and Education and Prof. Mototaka Senda, Director of OUSVO from Okayama University also participated in the opening event as hosts.

Scene of the opening ceremony

At the opening ceremony, President Prof. Morita stated his excitement about the OUSVO carrying out part of Okayama Univeristy's global strategy. It will play the role of a crucial hub, and notably contribute to the Silicon Valley culture, as well as helping unite industry there with academia.

Photograph taken near the entrance of the silicon valley office

The opening ceremony was followed by two significant symposiums. The first symposium was focused on cybersecurity and big data, chaired by Prof. Tokumi Yokohira with four panelists from San Jose State University and Okayama University. The second

focused on international medical device development collaborations between US and Japan organized by Prof. Yasutomo Nasu. The symposium, also introduced the capabilities of the team at Okayama University Hospital for carrying out sponsored clinical trials, Investigator-Initiated Trials (IITs) and Clinical Research.


Scene of the opening ceremony

OUSVO has mainly three missions: 1) developing international academia-industry relationships; 2) contributing to local society (industry, academia and government); and 3) being a part of a global contribution strategically stemming from Silicon Valley for advancing the promotion of research and education in Okayama University. OUSVO also supports international exchange student programs, as well as faculty exchange and collaboration globally.

Okayama University Silicon Valley Office (OUSVO) is located in Fremont, California.
Please feel free to contact us or stop by if you are visiting Silicon Valley on business.

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News

International collaboration work with Xiamen University, P. R. China

October 17, 2015

Professor Ren Lei of Xiamen University, P. R. China, along with four master course students, visited Okayama University from September 30 to October 6. They discussed their collaborative research and presented their Mobile Classroom Lab experiments in Okayama city at Sci-pia (Science and Humanity Museum for the Future) and Mino primary school.

Mobile Classroom Lab experiments were presented in Sci-pia

The host scientist for the Mobile Classroom Lab was Professor Ren. Following an explanation in English by Professor Ren, the pupils purified water using chemical reagents provided by Poly-Glu Social Business Co., Ltd. The experiments taught the pupils about the world's water problems, as well as chemical knowledge of the purification of the water.

At Mino primary school

These activities were conducted by Technical Research Officer Ms. Yuri Nakamura of the Center for Engineering Innovation (Faculty of Engineering) with advice from Professor Satoshi Hayakawa and Professor Akira Sakakura of the Graduate School of Natural Science and Technology. In addition, the activities were prepared in cooperation with the Office for the Promotion of Gender Equality, Public Relations and Information Strategy, the Academic and General Okayama University Regional Research Association and the International Alumni of Okayama University.

Since 2005, both Universities have taken part in a faculty-level international agreement to promote personnel exchanges and stronger local cooperation.

Details of the activity can be seen on the JST, facebook page.

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News

Ninth Entrance Ceremony Held for the "Okayama-Hue International Master's Program"

September 29, 2015

New Students and distinguished guests at the ninth entrance ceremony of the Okayama-Hue International Master's Program

Okayama University conducted the Ninth Entrance Ceremony for the "Okayama-Hue International Master's Program in Sustainability of Rural and Environmental Systems" at Hue University, Vietnam, on September 18.

The ceremony was attended by Yoko Yamamoto, Okayama University Vice President (International Affairs) and Kunio Kimura, Dean of the Faculty of Environmental Science and Technology, as well as graduates of the program and students who entered the program last year and are currently studying at Hue University. Vice President Yamamoto congratulated and encouraged the new entrants, and expressed her gratitude to everyone connected with the program in both universities. She also explained that Okayama University is implementing a wide range of student and faculty acceptance and dispatching programs in order to push forward with globalization. The special features of this program make it a pioneer in the internationalization of Okayama University.

Truong Quy Tung, Hue University Vice President (International Cooperation & Student Affairs) addressed the participants, saying, "Many of the students who have completed this program are now receiving scholarships to study in doctoral programs in Japan or other countries. There are also students who have found employment in jobs where they are able to make use of the major they have studied on this program, and we highly value the quality and achievements of the program."

In the first year of the program, students undergo specialist education in agricultural and environmental sciences at Hue University, and six months' language training in Japanese. After this the students transfer to the first phase of the doctoral program at Okayama University to study for a master's degree. A large number of excellent overseas students are now studying at Okayama University, having taken advantage of this program.

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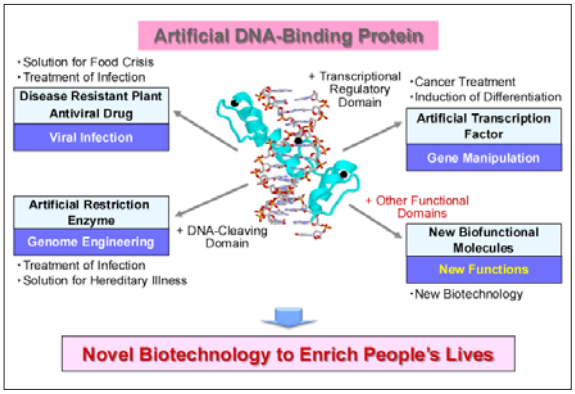
Feature

Designer DNA-binding proteins to combat viral infections in agriculture and medicine

Takashi Sera
Department of Bioscience and Biotechnology, Okayama University

Professor Takashi Sera, Department of Bioscience and Biotechnology, Okayama University.

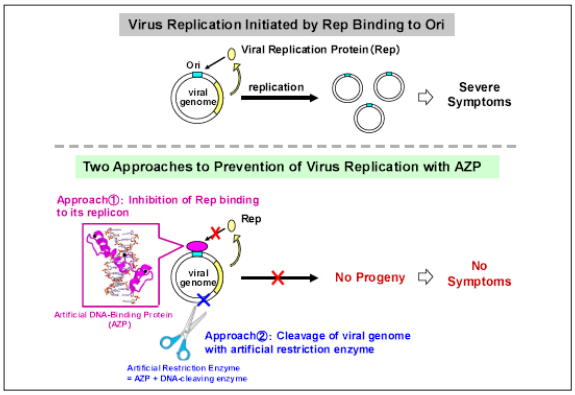
"Having trained as a chemist, in the early days of my research career I wanted to find ways of treating cancer based on knowledge of organic chemistry," says Takashi Sera, Professor at Department of Bioscience and Biotechnology. "But I soon realized that chemical molecules are hard and too rigid for such purposes. That is when I decided to focus on the use of proteins."



Application of Artificial DNA-Binding Proteins

And the outcome of this shift in strategy was the development of unique artificial DNA-binding proteins to prevent the proliferation of viruses in both plants and for treating cancer in humans. Specifically, Sera designs DNA-binding proteins to bond to a target virus 1000 times more strongly than the replication protein of the virus itself. Such blocking of bonding between a virus and its own replication protein prevents the spread of the virus.

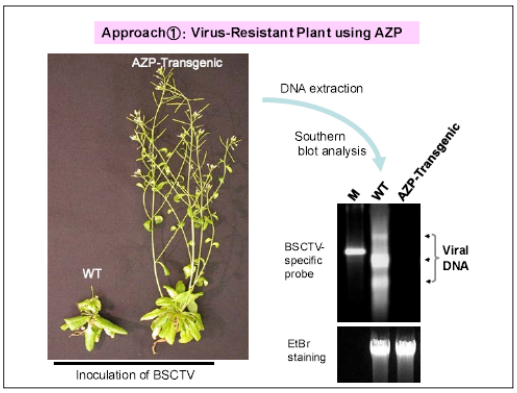
Important agricultural applications of DNA-binding proteins for producing plants resistant to virus infection include making virus-resistant cassava—a major crop and source of food for millions of people in Africa and Asia. Sera and colleagues have already produced proteins for tomatoes and are currently working on wheat. "The critical point about using DNA-binding proteins for antiviral strategies is that they are expected to be free of side effects," explains Sera. "The reason is because our proteins are produced by modifying natural proteins that already



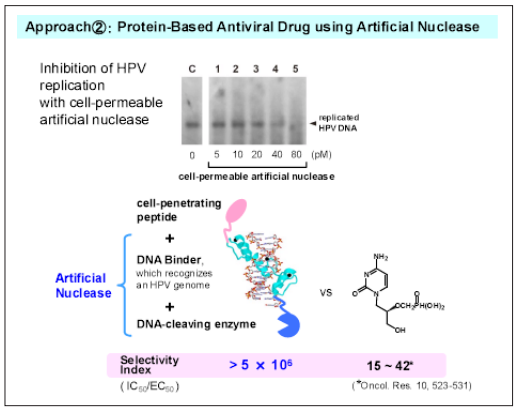
Two Approaches to Prevention of Virus Replication with Artificial DNA-Binding Protein

exist in everyday vegetables and meats." Sera and his group have also made tests on beet severe curly top virus—spread by so-called beet leafhoppers—that affects crops in western United States.

Sera has also come closer to realizing his dream of treating human cancer. "We are testing our approach for treating human papillomavirus," explains Sera. "This is strongly linked with cervical cancer. Side effect free treatment is particularly important for treating human diseases."



Approach #1 : Virus-Resistant Plant using Artificial DNA-Binding Protein



Approach #2 : Protein-Based Antiviral Drug using Artificial Nuclease

Summary of recent topics

1. Artificial DNA-binding proteins for disease resistant plant antiviral drugs
2. Artificial transcription factor for cancer treatment
3. Artificial restriction enzymes for treatment of infections and hereditary illnesses

Related research publications

1. T. Sera and C. Uranga, Rational Design of Artificial Zinc-Finger Proteins Using a Nondegenerate Recognition Code Table, *Biochemistry*, 41, 7074, (2002).
http://www.ncbi.nlm.nih.gov/pubmed/12033941
2. K.Tachikawa, O.Schröder, G. Frey, S.P. Briggs, and T.Sera, Regulation of the endogenous VEGF-A gene by exogenous designed regulatory proteins, *PNAS*, 0406473101, (2004)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC523457/
3. T. Sera, Inhibition of Virus DNA Replication by Artificial Zinc Finger Proteins, *J. Virology*, 79(4):2614, (2005).
http://www.ncbi.nlm.nih.gov/pubmed/15681461
4. T.Mino, T. Mori , Y.Aoyama, T. Sera, Cell-permeable artificial zinc-finger proteins as potent antiviral drugs for human papillomaviruses, *Arch Virol*, 153:1291, (2008).
http://www.ncbi.nlm.nih.gov/pubmed/18521532
5. T. Mino, T. Mori, Y. Aoyama, T. Sera, Gene- and Protein-Delivered Zinc Finger–Staphylococcal Nuclease Hybrid for Inhibition of DNA Replication of Human Papillomavirus, *PLoS ONE* 8(2): e56633, (2013).
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3577882/

Research Highlights

Immunizing plants: Creation of virus-resistant plants with artificial DNA-binding proteins

In order to resolve global food crisis, it is important to prevent plant viruses from spreading infections as they infect a wide variety of agricultural crops and significantly reduce yields. For example, gemini-virus, which forms a large family in a DNA virus, has caused over 200 billion yen worth of damage to cassava, which is a major staple food in Africa. So there is demand for effective methods to prevent such damage. A possible solution to this problem is the use of commercially available virus-resistant agricultural crops created by breeding that have some degree of resistance to viral infections. However, such crops become a new source of infection, as it is not possible to eliminate the infected virus from them. Therefore, scientists are still searching for long term solutions.

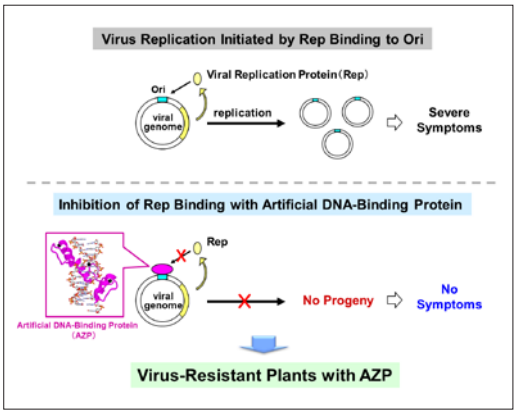


Figure 1: Creation of virus-resistant plants with AZP. Give virus resistance to a plant with an artificial DNA-binding protein (AZP) that binds 1,000 times more strongly than the viral replication protein (Rep) and effectively inhibits binding of Rep to the replication origin of viral genome.

Takashi Sera and colleagues at Okayama University have developed a new method for preventing DNA virus infection that is based on the idea that it is possible to prevent the development of viral infection symptoms if the virus can be prevented from growing even though it enters into a host plant.

This approach prevents viral infection by inhibiting replication protein (Rep) from binding to its replication origin by using an artificial DNA-binding protein capable of binding strongly to a target DNA sequence. To demonstrate the effectiveness of this method, the researchers used Arabidopsis, an experimental plant, and beet severe curly top virus (BSCTV), a DNA virus. BSCTV was chosen because it is known to strongly infect and kill many plants including Arabidopsis.

Based on this method, the researchers developed an artificial DNA-binding protein that binds 1,000 times more strongly than the Rep of BSCTV and effectively inhibits binding of Rep. Transgenic plants, Arabidopsis thaliana transformed with the artificial DNA-binding protein, showed no infection symptoms

Figure 2: Creation of virus-resistant plants with AZP. Plant A is a healthy wild plant without virus infection. Inoculated BSCTV to plants B, C and D. Stem of the wild plant (Plant B) stopped growing and died 4 weeks after BSCTV inoculation. In contrast, AZP-transgenic plants (Plants C and D) showed complete virus resistance. In our AZP-transgenic plants with no symptoms, viral DNA was not detected at all by Southern blot analysis.

at all even if it was inoculated with BSCTV. Moreover, it should be noted that viral DNA was not detected in the transgenic plants. Namely, this method not only prevents targeted plants from developing viral infection, but also gives immunity (not resistance) to them.

Since the early experiments, the Okayama group have successfully demonstrated the effectiveness of this method for vegetables. "Our latest challenge is to apply this method to cereals," says Sera. "With the aim of developing a virus-resistant wheat, we created an artificial DNA-binding protein for wheat (designated "Wheat_AZP"). We are currently performing gene transfer into wheat to demonstrate the effectiveness of this method for cereals in the near future."

Reference:

Takashi Sera and Carla Uranga : Rational design of artificial zinc-finger proteins using a nondegenerate recognition code table. *Biochemistry* 2002, 41, 7074–7081.
DOI: 10.1021/bi020095c
http://www.ncbi.nlm.nih.gov/pubmed/12033941

Takashi Sera : Inhibition of virus DNA replication by artificial zinc-finger proteins. *J. Virol.* 2005, 79, 2614-2619.
DOI: 10.1128/JVI.79.4.2614-2619.2005
http://www.ncbi.nlm.nih.gov/pubmed/15681461

Tomoaki Mori, Kosuke Takenaka, Fumiya Domoto, Yasuhiro Aoyama, and Takashi Sera : Inhibition of binding of Tomato yellow leaf curl virus Rep to its replication origin by artificial zinc-finger protein. *Mol. Biotechnol*. 2013, 54, 198–203.
DOI: 10.1007/s12033-012-9552-5
http://www.ncbi.nlm.nih.gov/pubmed/22576255

Reference (e-Bulletin) :

http://www.okayama-u.ac.jp/user/kouhou/ebulletin/feature/vol14/feature_001.html

• affiliations: Laboratory of Biofunctional Molecules Design, Division of Chemistry and Biotechnology, Department of Biotechnology, Graduate School of Natural Science and Technology, Okayama University
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Research Highlights

Identification of gene *Vrn-D4* for enabling wheat to adapt to areas with warm winters

Wheat is widely cultivated under diverse climatic conditions around the world. Vernalization plays an important role for avoiding injury from cold in winter, through suppressing precocious spike development before or during winter. In contrast, vernalization negatively affects adaptation in places with warm winter climates, and gene mutation so that vernalization is not needed could benefit wheat cultivation in such areas. Four genes, *Vrn-1*, *Vrn-2*, *Vrn-3*, and *Vrn-4*, are known to control vernalization in wheat, but until recently only the first three genes had been identified.

Kenji Kato and colleagues at the University of California, Davis, USA, identified the fourth vernalization gene *Vrn-D4* located on the 5DS chromosome. *Vrn-D4* proved to be the copy of gene *Vrn-A1* on chromosome 5AL, which was duplicated and inserted into 5DS. Comparisons with *Vrn-A1*, revealed nucleotide substitution in exon 4 (A367C) and introns. Among them, two SNPs (Single Nucleotide Polymorphisms) in intron 1 were within the RIP-3 (RNA immunoprecipitation-3) motif and caused no requirement of vernalization through the interaction with TaGRP2.

Vrn-D4 was mostly found in common wheat (*T. aestivum*) of South Asian origin. All accessions of *T. sphaerococcum* endemic to Pakistan and India proved to have *Vrn-D4* by which they don't need vernalization, and successfully adapted to warm conditions in South Asia. It was therefore suggested that *Vrn-D4* is closely related with the origin of *T. sphaerococcum*, which is specifically adapted to areas with warm winter climates.

Now, all of the four vernalization genes have been identified, providing important information for understanding vernalization in wheat and winter cereals. This finding significantly

Figure 1: Spring-type wheat normally headed without exposure to low temperatures (vernalization) in the seedling stage, while winter-type wheat stayed in a vegetative growth state.

Figure 2: Seeds of common wheat (left, *T. aestivum* cv. Triple Dirk) and *T. sphaerococcum* (right, KU-161).

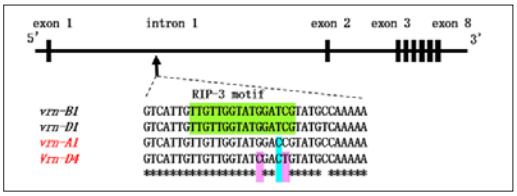

Figure 3: Schematic representation of the structure and RIP-3 sequence of *Vrn-1* and *Vrn-D4*.

contributed to the breeding of new wheat cultivars with stable production, even under changing climates, by fine-tuning the flowering time.

Reference:

- Authors: Nestor Kippes, Juan M. Debernardi, Hans A. Vasquez-Gross, Bala A. Akpinar, Hikment Budak, Kenji Kato, Shiaoman Chao, Eduard Akhunov, and Jorge Dubcovsky
- Title of original paper: Identification of the *VERNALIZATION 4* gene reveals the origin of spring growth habit in ancient wheats from South Asia
- Journal, volume, pages and year: Proceedings of the National Academy of Sciences of the United States of America 112, E5401–E5410 (2015).
- Digital Object Identifier (DOI): 10.1073/pnas.1514883112
- http://ousar.lib.okayama-u.ac.jp/metadata/53960
- Journal website: http://www.pnas.org/content/112/39/E5401.abstract
- Affiliations: Graduate School of Environmental and Life Science, Okayama University
- Department website: http://www.okayama-u.ac.jp/user/agr/eng/course_aps/plantgb.html

Research Highlights

Importance of introgression on intra-specific genetic differentiation and adaptive divergence

The origin of alpine plants in Japan can be traced back to migration from northern regions such the northern Pacific and Arctic during the Pleistocene glacial period. In contrast to this biogeographic history, alpine plants in Japan have to overcome different environmental conditions compared with more northern populations, such as higher temperature and shorter photoperiods. As a result, some adaptive divergence may have accumulated between northern and southern populations. To elucidate the mechanistic basis for adaptive evolution, analyzing genetic variation is an efficient approach.

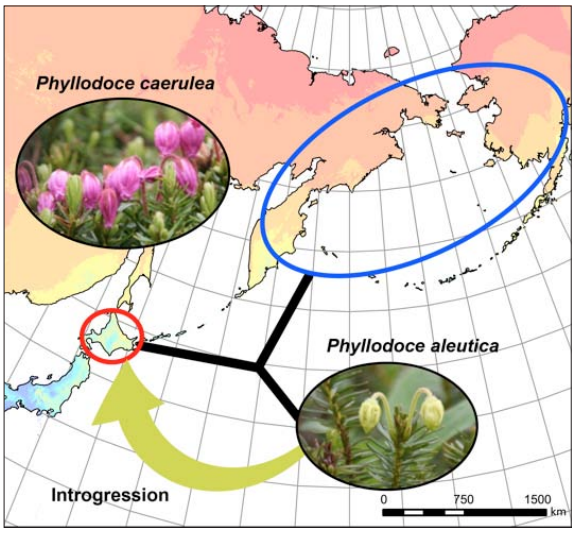

Figure: Summary of the finding. *Phyllodoce caerulea* in the northern Pacific and northern Japan belongs to distinct clade, where the latter clade was influenced by introgression from a relative species *Phyllodoce aleutica* (as shown by the large arrow). The color of land in the map represents annual precipitation, in which the bluish color harbored higher precipitation than reddish color.

Here, Hajime Ikeda at the Institute of Plant Science and Resources at Okayama University and colleagues have found that the arctic-alpine plant *Phyllodoce caerulea* in northern Japan is genetically distinguishable from its northern populations in the northern Pacific. Notably, a simulation analysis demonstrated that the genetic variation in northern Japan originated by introgression from a relative species *Phyllodoce aleutica*. Furthermore, they show that northern Japan and northern Pacific regions have differences in annual precipitation.

Accordingly, the genetic structure caused by introgression is associated with the geographic distributions as well as environmental differences. This suggests that *P. caerulea* having alleles of *P. aleutica* may be adaptive to environments in Hokkaido with higher precipitation. This study contributes to the understanding of the evolutionary importance of introgressive hybridization, which has been long disputed in plant evolutionary biology.

Reference :

- Authors: Ikeda H, Sakaguchi S, Yakubov V, Barkalov V, Setoguchi H.
- Title of original paper: Importance of demographic history for phylogeographic inference on the arctic–alpine plant Phyllodoce caerulea in East Asia.
- Journal, volume, pages and year: *Heredity* (2016) 116, 232–238.
- Digital Object Identifier (DOI): 10.1038/hdy.2015.95
- Journal website: http://www.nature.com/hdy/index.html

- Affiliations: Institute of Plant Science and Resources, Okayama University.
- Department website: http://www.rib.okayama-u.ac.jp/wild/index.html

Research Highlights

An interesting twist on supercooled liquid water

Water is known to have various anomalous properties, and they are especially prominent below room temperature. For example, liquid water exhibits expansion when it is cooled below 4°C, and it keeps expanding when it is supercooled below the freezing point, 0°C. Finding a unified explanation of the anomaly of water is a long-standing challenge. It is important not only in physical chemistry but also in various other fields of science, such as biology and astronomy.

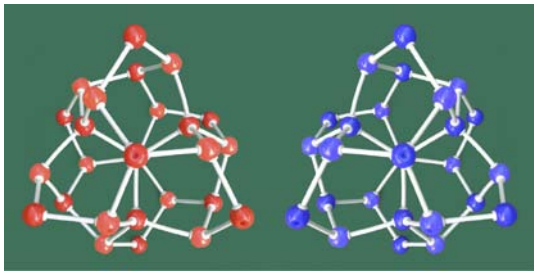

Figure: Right- and left-twisted molecular ordering in supercooled liquid water.

Using computer simulations Masakazu Matsumoto and his collaborators, Takuma Yagasaki and Hideki Tanaka, succeeded in detecting the molecular ordering in supercooled liquid water. Liquid water at low temperatures is not a homogeneous liquid but a dynamic aggregate of ordered nano grains. “Liquid water seems smooth and simple,” says Matsumoto, an associate professor at Okayama University. “But it conceals complexity behind its appearance.”

The team obtained many configurations of water molecules in liquid water by a computational technique called molecular dynamics, and analyzed the local structures in water using a pattern-matching technique. Finally, they found that the special structure named “extended polytope” is the most abundant at low temperatures. This tiny and twisted structure is as stable as crystal ice and exists as nano-sized grains. The grains are chiral, i.e. there are two types of the structure that are mirror images of each other.

“Emergence of the chiral order is quite surprising,” says Yagasaki, an assistant professor at Okayama University. “It has been thought that the liquid structure of water becomes ice-like when it is supercooled, but no known crystal ice structure possesses chirality at any length scale.”

Their new analysis method enables a new way of recognizing order in the water molecules around biomolecules and in amorphous ice. The twisted structures of water might induce a new kind of interaction between the molecules dissolved in water, and might hinder ice nucleation.

“Water plays a central role in living things.” says Dr. Tanaka, a professor at Okayama University. “Our discovery will allow us to reconsider the synergy between water and life from a different angle.”

Reference:

- Authors: Masakazu Matsumoto, Takuma Yagasaki, and Hideki Tanaka.
- Title of original paper: Chiral ordering in supercooled liquid water and amorphous ice.
- Journal, volume, pages and year: *Physical Review Letters* **115**, 197801 (2015).
- Digital Object Identifier (DOI): 10.1103/PhysRevLett.115.197801
- http://ousar.lib.okayama-u.ac.jp/metadata/53939
- Journal website:
  http://link.aps.org/doi/10.1103/PhysRevLett.115.197801
- Affiliations: Department of Chemistry, Faculty of Science, Okayama University.
- Department website:
  http://www.chem.okayama-u.ac.jp

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OKAYAMA UNIV. e-Bulletin. Adsorption mechanism of inhibitor and guest molecules on the surface of methane hydrate. Vol.13, Dec, 2015.
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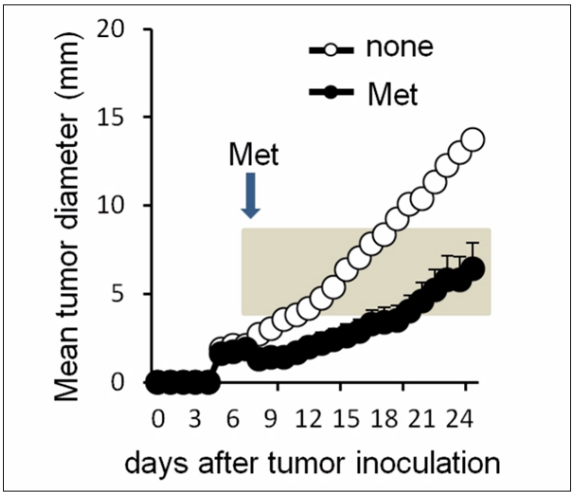
Intellectual Property and Enterprise

Type 2 diabetes drug, metformin, re-activates immune-exhausted tumor infiltrating CD8T lymphocyte in tumor microenvironment and confers significant anti-tumor immunity

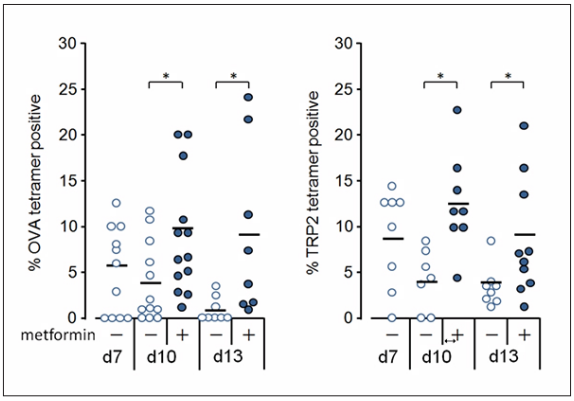
Anti-cancer effect of tumor infiltrating $CD8^+$T lymphocyte (CD8TIL) is suppressed by interaction between immune-checkpoint molecules such as PD-1 and CTLA-4 expressed on CD8TIL and their ligands expressed on cancer cells, which is referred to as immune-exhaustion. Cancer immunotherapy with antibody-mediated, immune-checkpoint blockade is now promising in preventing advanced melanoma and non small cell lung carcinoma (NSCLC). Such antibody-mediated immunotherapy, however, faces their enormous financial problem and significant side effects like autoimmune diseases.

On the other hand, metformin, a safe and low cost drug prescribed for patients with type 2 diabetes, has been recognized to have anti-cancer effect. We found that CD8TIL is a target of metformin. CD8TIL inevitably undergoes immune-exhaustion, characterized by diminished production of multiple cytokines such as IL-2, TNFα and IFNγ, followed by elimination with apoptosis. Metformin is able to counter the state. Metformin, thus, blocked immune exhaustion within tumor tissues.

Mice administered metformin by free drinking water, showed significant tumor growth inhibition in 6 distinct tumor models and CD8TIL becomes resistant against apoptosis, furthermore, it begins to produce multiple cytokines. Blood concentration of metformin in those mice is almost comparable to that of type 2 diabetes patients who are taking metformin daily. Therefore, along with other cancer immunotherapies, treatment of cancer patients with metformin may significantly improve the efficacy and have a great benefit for their prognosis.



Mice inoculated with melanoma cells (MO5 expressing OVA) were treated w/o metformin(Met) from day 7, as indicated by the shadowed rectangle, and tumor growth was monitored. Metfromin treated mice showed significant inhibition of tumor growth.



On days 7, 10 and 13, TILs were recovered from tumor masses, and $CD8^+$ TILs were examined for K^b-$OVA_{257-264}$ and K^b-$TRP2_{180-188}$ tetramer binding (n = 7–13) by flow cytometry analysis. The population of $CD8^+$ TILs specific for either antigen, $OVA_{257-264}$ or $TRP2_{180-188}$, was significantly increased in metformin treated mice (+), compared with non-treated mice (-). The accumulation of antigen specific of $CD8^+$ TILs is caused by inhibition of apoptosis by metformin treatment.

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Reference:

• Authors: Shingo Eikawa, Mikako Nishida, Shusaku Mizukami, Chihiro Yamazaki, Eiichi Nakayama and Heiichiro Udono
• Title of original paper: Immune-mediated anti-tumor effect by type 2 diabetes drug, Metformin
• Journal, volume, pages and year: Proceeding of the National Academy of Sciences, USA, 112 (6) 1809-1814, 2015
• Digital Objective Identifier (DOI): 10.1073/pnas.1417636112
• Journal website:
http://www.pnas.org/content/112/6/1809.abstract
• Affiliations: Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Japan.

Topics : Letters from alumni

Okayama University International Alumni Association - A bridge to the world.

Zhang Hong
Tenured Professor of Okayama University
Director of the Okayama University Alumni Association
President of the Okayama University International Alumni Association
Guest Professor of Beijing University
Lawyer of Zhonglun Law Firm

The Belgrade Branch of Okayama University's International Alumni Association was established in December 2014. The event, which took place in Serbia, was favored by a visit from President Mrkić. In the picture from the right, Prof. Kayoko Yamasaki (Department of Letters, Belgrade University), Prof. Zhang Hong (Faculty of Law at Okayama University), President Mrkić, Kiyoshi Morita (President, Okayama University), Prof. Michitaka Suzuki (Department of Letters, Okayama University).

I am Zhang Hong, a professor at the Graduate School of Humanities and Social Sciences of Okayama University. I first came to Okayama University in 1989 and spent two years here as a master's student. After this I took my doctoral degree at Hiroshima University and subsequently began teaching corporate law at the Graduate School of Law of Beijing University whilst later enrolling as researcher at places such as Tokyo University's Research Center for Advanced Science and Technology and the Law School of Washington University. In April of 2000 I returned to Okayama University (my alma mater) to become a professor in the Department of Law. In this e-bulletin I would like to take the opportunity to talk about my experiences in Okayama and express my gratitude both to the university and the people of this area for the moral and material support they have given me.

Zhang Hong, chairing the General Meeting of Okayama University International Alumni Association(OUIAA) in October 2015.

First of all then, why did I choose Okayama University? I first came to Japan through joining a one-year training program in Japan when I was a member of a government-sponsored youth group. This experience taught me that the actual Japan is very different from the one pictured in textbooks. Meeting with residents of this wonderful city, Okayama, I was able to learn many things, thanks to its different culture and customs, for which I am really grateful. When my training program ended, I

was determined to come back to Japan and study. The following year, I started my life as an exchange student in Okayama University.

In my eyes, Okayama University excels in comparison to many other universities, because the University is blessed with the beauties of nature, has kind and gentle people, and a beautiful campus. I also love living in Okayama City because it feels like my second hometown. Looking back, I feel that my experience on the exchange program taught me many things and changed me as a person. I was able to develop better communication skills, become more confident about myself and also more flexible with the people around me. In addition, I learned the importance of empathy, of not just pursuing my own selfish interests, but of trying to see things from the other person's point of view.

The Cambodia Branch of Okayama University's International Alumni Association was established in December 2015.The event, which took place in Phnom Penh, was favored by a visit from Dr. Hang Chuon Naron, Minister of Education.
In the picture from the right, Sieng Sovanna(Director of National Institute of Education), Hang Chuon Naron,;
Kiyoshi Morita (President, Okayama University)Prof. ,Kita Masakazu (Deparment of Graduate School of Education, Okayama University).Prof. Zhang Hong (Faculty of Law at Okayama University).Prof. Tatsuo Iwasaki, (Deparment of Anesthesiology and Resuscitology all rights reserved, Okayama University)

We have a Chinese proverb which means "When you receive a favor, you should not forget to give back double the amount." I am not sure how I can do this, but I have decided anyway that I can begin to return the favor by becoming a bridge between Japan and China, and try to work for closer relations between the two. In this way, I hope to contribute to society.

As president of Okayama University International Alumni Association, I am trying my best to establish more overseas branches of our university all around the world. In 2015, we have branches in Germany, Istanbul, Egypt, America in Europe and America, and China, Taiwan, Korea, Mongolia, Thailand, Myanmar, Viet Nam and many more in Asia, a total of 46 branches. These branches not only establish friendly connections with local communities, they also invite successful students to exchange programs in Okayama University. The sixth general meeting is scheduled to be held in October 2016, and by this time we hope to have increased the number of established branches to fifty, while also expanding the activities of these branches. I hope all these efforts will be fruitful.

Finally, I would like to thank all of you who have done so much to support us, and I look forward very much to continue to receive your valuable support for the further development of both Okayama University and our International Alumni Association.

Topics : Okayama Travelogue

Okayama denim and Okayama University student's jeans venture company

Okayama Prefecture has a long history of manufacturing textiles. The most recent addition to this tradition is Okayama denim and Kojima, the birthplace of jeans in Japan.

There are many brands of denim made in Okayama and even a 'Jeans Street' in the Kojima district of Seto Inland Sea (*Seto Naikai* in Japanese). Examples include Kojima Genes; Denim Closet from Kurashiki; The Strike Gold; and Tenryo Denim. Irrespective of the brand, all the jeans are made in Okayama using denim material that is also made in Okayama.

Notably, in September 2015 students from Okayama University launched the venture company 'Every Denim'—that was awarded the top prize in the 'Global Shapers Community Tokyo Start Up Challenge Cup' at a forum held in March 2015. The Every Denim website features interviews with jeans manufacturers and a wealth of information about Okayama denim industry.

One of the main reasons for the award is that Every Denim directly connects factories where jeans are made to consumers. The company uses their website to highlight jeans made at factories in Okayama. This business model allows Okayama's jean's manufacturers to produce and sell jeans directly to customers without going through intermediary companies.

Further information

Okayama Prefectural International Tourism board
http://okayama-japan.jp/en/skillfull/okayama-tokusan/jeans.html

Every Denim (Japanese)
http://everydenim.com/

Topics : Club Activities

Okayama University Gymnastics Club

"The Okayama University Gymnastic Club was set up in 1949," says Captain Kazuyoshi Akaishi, a 2nd year engineering student. "We have 17 members of whom half are female, and again, half are total new comers to gymnastics. The members have stoic personalities."

Some features of the club include that it has a high level because it has many experienced members and beginners are able to get good training by close interaction with more experienced people because the club does not have too many members.

The members practice 4 times a week and also hold training camps with students from other universities nearby. Training sessions start with warming up followed by dividing up into groups for making our bodies for flexible, and weight training. The club regularly participates in inter-university competitions as well as local student gatherings. For the last two years, the female members of the club have won the group competition in the 'chug-shi-koku' contest.

The members of the club go skiing and swimming together during long holidays and they have arrange an 'old boys' gathering once every four years.

"Gymnastics does not have language barrier," says Captain Akaishi. "We openly welcome international students to join us. We can learn more about each other's culture as well as improving our gymnastics skills."

