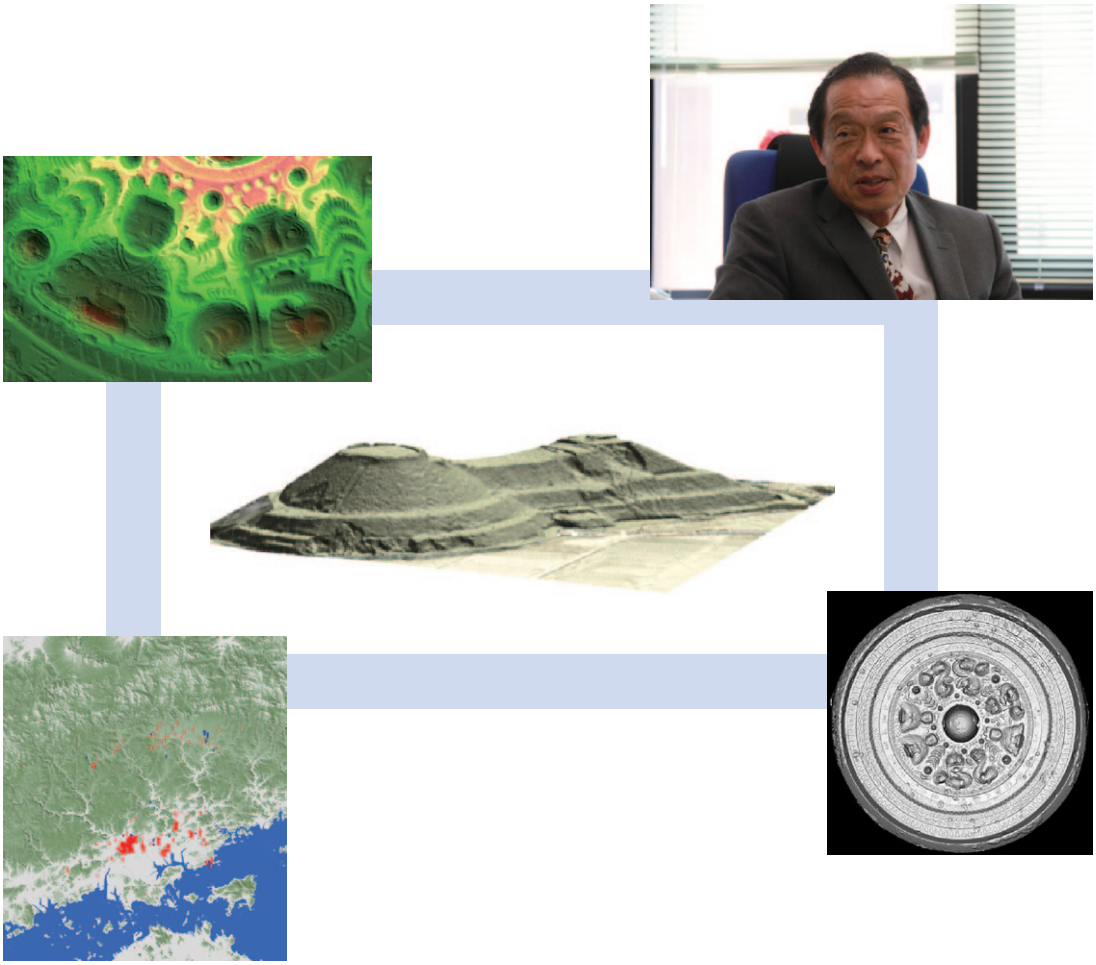
OKAYAMA UNIV. e-Bulletin



Vol. 3, June 2013

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Contents

News

Jian-Ren Shen is awarded the prestigious 2012 Asahi Prize

Professor Jian-Ren Shen of the Graduate School of Natural Science and Technology (Faculty of Science) was awarded the 2012 Asahi Prize for his achievements of his 'Elucidation of Molecular Mechanisms in Water Decomposition / Oxygen Evolution in Photosynthesis'.

Jian-Ren Shen with the Asahi Prize
(photo courtesy of Asahi Shimbun)

The Asahi Prize was founded in 1929 by the Asahi Shimbun Foundation. It is awarded to individuals or organizations that have made significant contributions to the development and improvement of Japan's culture and society by outstanding achievements in the fields of science or arts. This award is an extremely distinguished prize, and many of its past winners have gone on to receive the Nobel Prize or have been decorated with the Order of Culture.

Professor Shen is renowned for his research on the structural analysis of photosynthetic proteins. In 2011 he used Japan's world-famed SPring-8 (Super Photon ring-8 GeV) synchrotron radiation facility to clarify the reaction mechanism responsible for generating oxygen during photosynthesis in plants via the adsorption of light energy in. These results received tremendous international attention, which led to the research being selected by AAAS Science Magazine as a 'Breakthrough of the Year 2011'.

The Asahi Prize was jointly awarded with Professor Nobuo Kamiya of the OCU Advanced Research Institute for Natural Science and Technology of Osaka City University, who was the joint researcher on this project. The prize-giving ceremony was held in January 31 at the Imperial Hotel in Hibiya, Tokyo.

The Asahi Prize:
http://www.asahi.com/shimbun/award/asahi/english.html

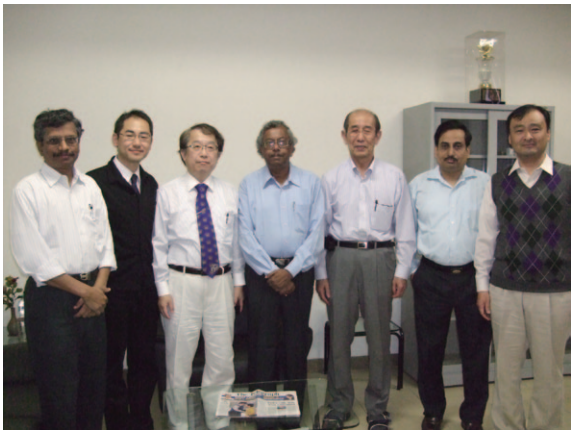
Breakthrough of the Year, 2011:
http://www.sciencemag.org/site/special/btoy2011/

Spring-8:
http://www.spring8.or.jp/en/

News

Vice President Shin-ichi Yamamato leads delegation to India to visit national research institutes and Okayama University-India collaborative research center

On 2 December 2012 Dr. Shin-ichi Yamamato, Executive Director for research led a party of Okayama University delegates to Kolkata, West Bengal, India to visit the National Institute of Cholera and Enteric Diseases (NICED), the I.D. & B.G. Hospital, University of Calcutta, and the Collaborative Research Center of Okayama University for Infectious Diseases in India—the director of the center is Dr. Sumio Shinoda, specially appointed / honorary professor.



Director Yamamoto (third from left) in a commemorative photograph with Dr. Chakrabarti (fourth from left), acting director of NICED.

Established by Okayama University in 2007, the center is the only Japanese research institute for infectious diseases for India, and currently there are three researchers and one administrative employee from Okayama University working there with researchers in India. This visit by Shin-ichi Yamamato and his colleagues was undertaken as part of enhancing cooperation in winning the war against enteric diseases such as cholera, which still take many lives in India.

Dr. Yamamoto's party visited NICED, hospitals and universities for a firsthand look at the treatment of patients and for direct discussions with scientists on the current status of research on infectious diseases in India. A joint seminar was held by NICED and Okayama University, with emphasis how to strengthen coordination in the future. This visit to the center also enabled the Okayama group enhance their networks with counterparts in India for further research promotion.

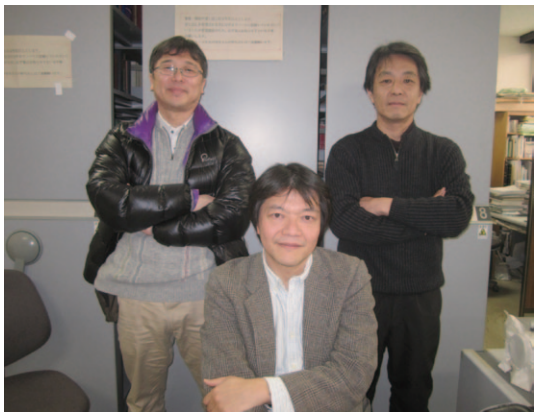
The Collaborative Research Center of Okayama University for Infectious Diseases in India
http://www.pharm.okayama-u.ac.jp/research/content0004.html

NICED:
http://www.niced.org.in/

News

Yuji Hasegawa of Vienna University of Technology describes his ground breaking findings on quantum physics and the Heisenberg principle

In January 2012 Professor Yuji Hasegawa of the Vienna University of Technology reported new experiment facts that overturned the long-held Heisenberg Uncertainty Principle—one of the fundamental pillars of quantum physics.



Professor Yuji Hasegawa (center) and Professor Naoshi Ikeda (right).

In recognition of the scientific importance of these findings Okayama University invited Professor Hasegawa to give a seminar about his findings in February 2013. He accepted the invitation and described his research at a seminar entitled, 'Beyond the Heisenberg Uncertainty Principle'.

The 'Heisenberg Principle' was first proposed by German theoretician Werner Heisenberg in 1927 and is a fundamental concept that is described in quantum physics textbooks. Due to the many ambiguities surrounding the principle, proofs and counter-proofs have been proposed for many years, until Professor Masanao Ozawa of Nagoya University announced the Ogawa Uncertainty Formula, which finally overturned the principle. Professor Hasegawa proved the validity of this formula through his experiments, which become a major global news item.

The lecture was realized as a result of an invitation by Professor Naoshi Ikeda of the Okayama University Graduate School of Natural Science and Technology. Professor Hasegawa gave a clear and succinct description of his experimental procedures to prove the Ogawa Uncertainty Formula, and explained how his verification will have a major impact on society through the development of quantum computers, quantum encoding technology, and applications to computational finance. The seminar was followed by many questions and a discussion with students and researchers in the audience.

Professor Hasegawa's paper (English):
http://www.nature.com/nphys/journal/v8/n3/full/nphys2194.html

Vienna University of Technology:
http://www.tuwien.ac.at/en/tuwien_home/

News

Itsuo Nakano is one of the international group of scientists involved in research on the discovery of the Higgs Boson selected by AAAS Science for Science Breakthrough of the Year 2012.

The AAAS Science Magazine announced its ten 'Breakthroughs of the Year' for the scientific world in 2012. The top breakthrough was chosen to be the discovery of the Higgs boson by an international team at the European Organization for Nuclear Research (CERN). This research was conducted jointly between CERN and researchers located all of the world including Okayama University's Professor Itsuo Nakano, of the Research Core for Extreme Quantum World's.

Itsuo Nakano describing his research on the Higgs boson at a meeting held at Okayama University recently.

The Higgs boson was the one undiscovered particle of the 17 essential particles of elementary particle physics. As the particle giving mass to elementary particles, it has been called the 'God particle' and its discovery has major scientific significance. Okayama University will continue through Professor Nakano to work on elucidating the properties of the Higgs boson in close conjunction with other research organizations worldwide.
Recently, Science Magazine chosen the structural analysis of photosynthetic proteins by Okayama University's Professor Jian-Ren Shen as one of the breakthroughs of 2011.

Science "Breakthrough of the Year, 2012":
http://www.sciencemag.org/site/special/btoy2012/

Center of Quantum Universe, Faculty of Science, Okayama University:
http://fphy.hep.okayama-u.ac.jp/center-qu/index.html

Feature

Japan's ancient 'Kofun' burial mounds: Fusion of traditional archaeology with cutting edge information technology to uncover the mysteries of ancient civilizations.

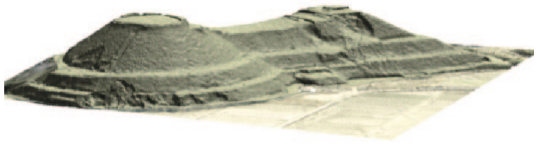
Professor Izumi Niiro is an archaeologist using powerful geographic information systems technology to accurately survey Japanese burial mounts or 'Kofun' built between the third to seventh centuries.

"I first became aware of geographic information systems during a sabbatical at Southampton University in 1991," explains Professor Niiro. "I decided to experiment with this technology for archaeological surveying when I returned to Japan. It enables me to visualize and analyze many types of geographical information such as topographic details of maps."

Initially Professor Niiro started by using IDRISI from Clark University. "These days I use GRASS (Geographic Resources Analysis Support System) open source system software," says Professor Niiro. "The data analysis was initially done using the Perl programming language, but these days I use Python." Professor Niiro confides that there are very few archaeologists in Japan, if any, who produce their own software programs to analyze geographic information.

Findings by Professor Niiro include visualization of a bronze mirror from the early Kofun Period, third century (Figs. 1 and 2). "I wrote my own software to visualize the surface of the mirror based on 3D scan information," explains Professor Niiro. "Our results clearly show a triangular-rimmed mirror that is decorated with deities and beasts."

Japan has many Kofun sites. Fig. 3 shows the distribution of typical 'key-holed' burial mounds in Okayama Prefecture. The largest site in Okayama and the fourth largest in Japan is the Tsukuriyama Kofun—



3D image of Tsukuriyama Kofun, Okayama-shi, Okayama Prefecture
Visualized from the digital data surveyed by Department of Archaeology, Okayama University
Tsukuriyama Kofun (350m in length, 5th century AD) is the fourth biggest burial mound in Japan

Professor Izumi Niiro

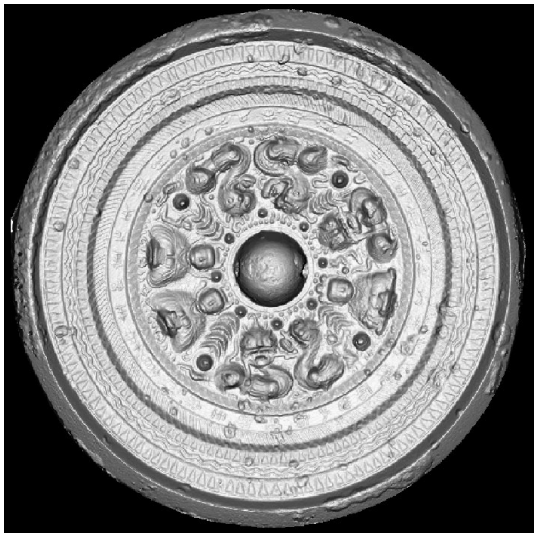


Fig. 1: Bronze mirror from early Kofun Period (3rd century AD). Triangular-rimmed mirror decorated with deities and beasts. Source: Gongen-yama No. 51 Tomb, Tatsuno-shi, Hyogo Prefecture

the burial mound of the king of the 'Kibi' completed in the fifth century. The tomb consists of the main Tsukuriyama burial mound and six smaller structures to the south. The dimensions of the Tsukuriyama Kofun are: length-350m, key-hole diameter-200m, height-31 m, and front length-215m. "Our analysis shows that it was built using very precise procedures using Chinese 'shaku' units of length," says Professor Niiro. "One shaku is 232 mm."

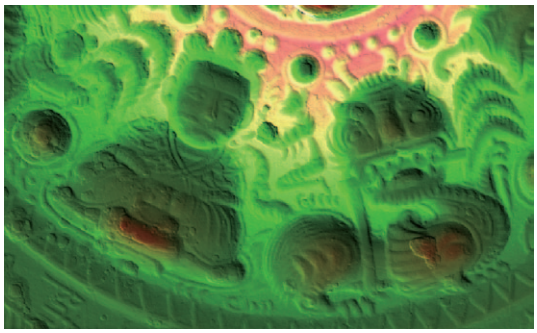


Fig. 2 A part of the same mirror shown in Fig. 1, showing details of a deity and beast visualized from data of 3D scans.

Recently, Professor Niiro is extending his research activities to the effect of disasters on culture and civilization. "Volcano eruptions have had tremendous effects on the environment and human culture," says Professor Niiro. "In particular the sixth century saw unprecedented changes in the environment. In Japan, the Emperor of the time ordered the storage of rice in northern Kyushu to assist people in Korea who were affected by disasters precipitated by global climate changes. Similar disastrous effects of climate changes occurred in Ireland. The recent massive earthquake and tsunami in Tohoku has led to the rise in 'disaster archaeology'. The Kofun Period ended in 600 AD probably due to climate change. This led to the introduction of Buddhism in Japan. Archeologists still have a lot to do. "

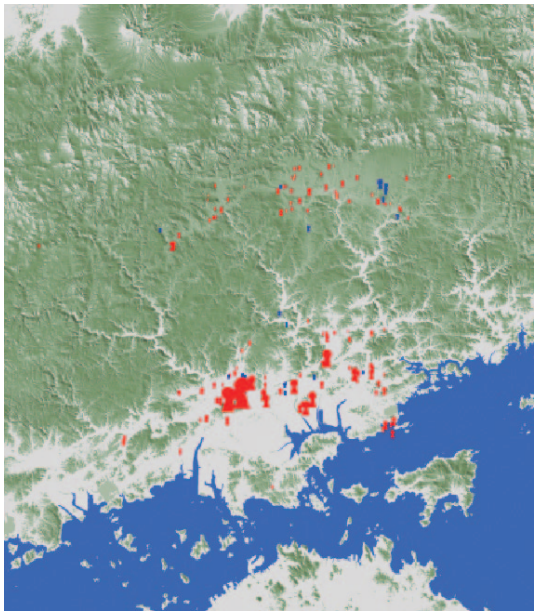


Fig. 3: Distribution of keyhole-shaped burial mounds in Okayama Prefecture. Keyhole-shaped mounds (red) and those with quadrangular rear portion (blue). Topography visualized from digital elevation models published by Geographical Survey Institute.

Further information

Professor Izumi Niiro website:
http://www.okayama-u.ac.jp/user/arch/about/niiro.html

Kofun(Source: Wikipedia)
http://en.wikipedia.org/wiki/Kofun

▪ Research Highlights

Observation of a new particle in the search for the Standard Model Higgs boson

The Standard Model (SM) Higgs boson has been searched for more than forty years, which gives mass to massive elementary particles in the standard model of high energy physics.

The nature of the SM Higgs boson has been well understood but the mass value cannot be predicted and the past experiments have not had enough energy to produce the boson.

Recently a new particle has been found with the ATLAS and the CMS detectors at the Large Hadron Collider (LHC). Both are huge groups and the ATLAS has more than three thousands people. Dr. I. Nakano (Graduate School of Natural Science and Technology, Department of Physics- Faculty of Science, and Research Center of Quantum Universe-Faculty of Science of Okayama University) is one of the members.

The LHC is 7-8(14 in 2019)-Tev proton-proton collider. and the ATLAS detector consists of Inner detector, Calorimeter and Muon detector. Produced particle energy and momentum are measured by the detectors and the invariant mass is reconstructed.

The new particle was seen in the invariant mass of four leptons (Fig. 1) and two gammas (Fig. 2). The mass was 126.0±0.4 (stat)±0.4 (sys) GeV.
The transverse mass for WW decays (Fig. 3) does not show the resonance peak but is consistent with the expected transverse mass from Higgs mass =125 GeV.
Therefore, these observations are compatible with the production and decay of the SM Higgs boson. We need more investigation to confirm the new particle as the SM Higgs.

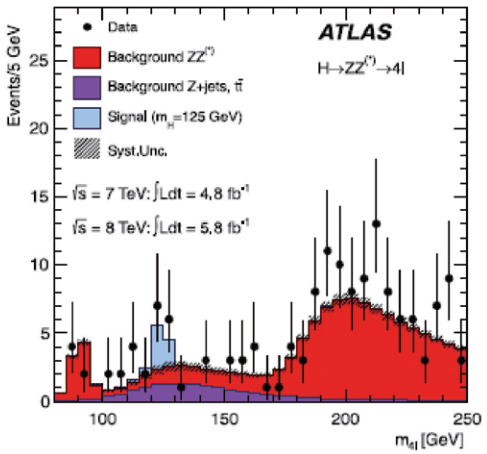


Figure 1 Caption : The distribution of the four-lepton invariant mass m4l, in the 80-250 GeV mass range for the √s = 7TeV and 8TeV

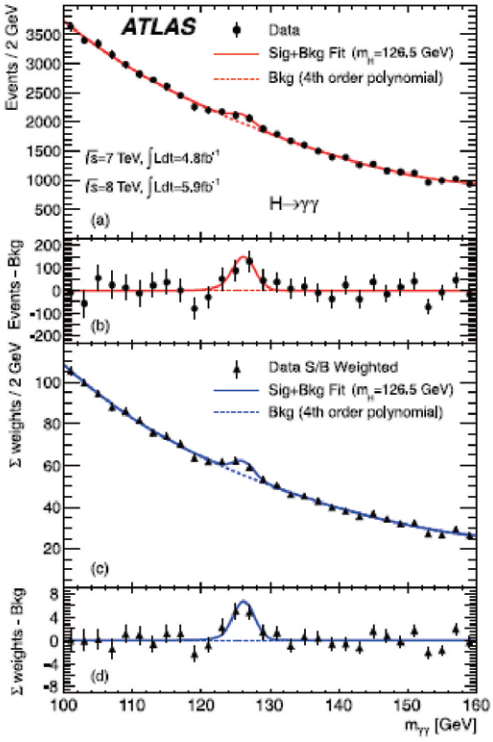


Figure 2 Caption : The distribution of the invariant mass of diphoton candidates. The inclusive sample is shown in (a) and a weighted version in (c). The residuals of the data and weighted data with respect to the respective background component are displayed in (b) and (d).

If the new particle is the SM Higgs, we understand the origin of mass. In addition to it we start to complete the SM and to go further understanding of the elementary particle physics and our Universe.

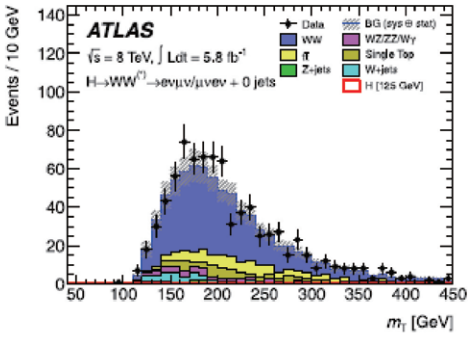


Figure 3 Caption : Transverse mass distribution in the WW control region for the 0-jet channel. The eμ and μe final states are combined. The hashed area indicates the total uncertainty on the background prediction. The expected signal for m_H = 125 GeV is negligible and therefore not visible.

Reference:

- Authors : G. Aad et al. (ATLAS collaboration)
- Title of original paper : Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC
- Journal, volume, pages and year : Physics Letters B716, 1(2012).
- Digital Object Identifier (DOI) :: 10.1016/j.physletb.2012.08.020

Research Highlights

Construction of silafluorenes based on transition metal catalyzed C-H activation

Siloles with two annulated benzo groups are referred to as silafluorenes or dibenzosiloles. Silafluorene derivatives have important industrial applications including photovoltaic devices/solar cells, and light-emitting diodes (LEDs), and as field effect transistors (FETs).

The conventional method for the synthesis of silafluorenes (Figure 1) consists of the lithiation of o,o'-dihalobiphenyl followed by quenching with a dichlorosilane. In order to introduce substituents at desired positions, several methods using transition metal complexes have been reported recently.

As new and novel strategy for the synthesis of silafluorenes, Takai and Kuninobu employed a method based on metal-catalyzed double activation of Si-H and C-H bonds with dehydrogenation. Tertiary silanes with a biaryl substituent were treated with Wilkinson's catalyst [$RhCl(PPh_3)_3$] for high yields of silafluorenes (Figure 2). The rhodium-catalyzed synthesis of silafluorenes from biphenylhydrosilanes via both Si-H and C-H bond activation is highly efficient because only dihydrogen is produced as a side product.

The advantage of this approach over other methods is that a silafluorene can be produced that contains a substituent or substituents on only one of the rings of the silafluorene. Furthermore, this method is also adaptable for the preparation of silafluorenes that contain other aromatic rings starting from suitably substituted phenylsilanes, and also for the construction of a ladder-type bis-silicon-bridged *p*-terphenyl compound (Figure 2).

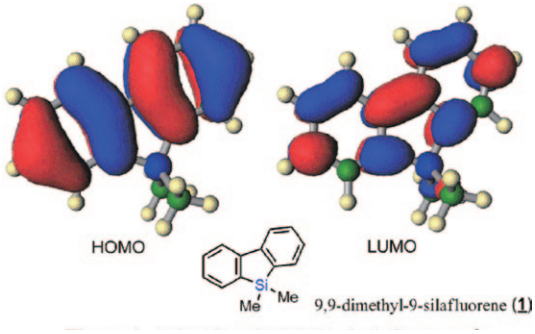


Figure 1. HOMO and LUMO of silafluorene 1

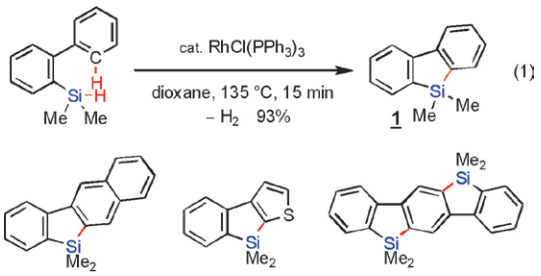


Figure 2. Synthesis of 9-Silabifuluorenes

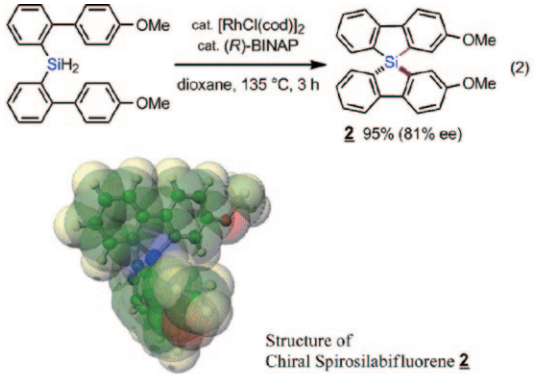


Figure 3. Asmmetric Synthesis of Chiral Spirosilabifluorene 2

Examples of the synthesis of chiral organosilicon compounds are still rare among chiral organic compounds. This rhodium-catalyzed double dehydrogenative cyclization was employed for the construction of chiral bis(biphenyl)silanes having a quaternary silicon atom. Heating bis(biphenyl) silanes bearing substituents on the aromatic ring with a chiral rhodium catalyst gave chiral spirosilabifluorenes in high yields and enantiomeric excesses. The stereochemistry of the major enantiomer of the product was determined by X-ray single crystal structure analysis. Construction of chiral spirosilabifluorenes may lead to new research areas in materials chemistry (Figure 3).

Reference:

1.
• Authors: Tomonari Ureshino,[1] Takuya Yoshida,[1] Yoichiro Kuninobu,[1,2] and Kazuhiko Takai[1]
• Title of original paper: Rhodium-Catalyzed Synthesis of Silafluorene Derivatives via Cleavage of Silicon Hydrogen and Carbon Hydrogen Bonds.
• Journal, volume, pages and year: *J. Am. Chem. Soc.* 132 (41), 14324-14326 (2010).
• Digital Object Identifier (DOI): 10.1021/ja107698p
• Affiliations:
1: Division of Chemistry and Biotechnology, Graduate School of Natural Science and Technology, Okayama University, 3-1-1 Tsushima-naka, Kita-ku, Okayama, 700-8530 Japan
2: Present address: Graduate School of Pharmaceutical Sciences, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033 Japan

2.
• Authors: Yoichiro Kuninobu,[1,2] Kanae Yamauchi,[1] Naoya Tamura,[1] Takayuki Seiki,[1] and Kazuhiko Takai[1]
• Title of original paper: Rhodium-Catalyzed Asymmetric Synthesis of Spirosilabifluorene Derivatives
• Journal, volume, pages and year: *Angew. Chem., Int. Ed.* 52 (5), 1520-1522 (2013).
• Digital Object Identifier (DOI): 10.1002/anie.201207723
• Affiliations:
1: Division of Chemistry and Biotechnology, Graduate School of Natural Science and Technology, Okayama University, 3-1-1 Tsushima-naka, Kita-ku, Okayama, 700-8530 Japan
2: Present address: Graduate School of Pharmaceutical Sciences, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033 Japan

• Author website: http://www.achem.okayama-u.ac.jp/omc/index.html

Research Highlights

Measuring the copy number limits of all genes in budding yeast. – First time ever for any organisms –

Over-expression of proteins due to the increase in the gene-copy numbers is considered to be the cause of pathologies of diseases such as Down syndrome and cancer, which involve chromosomal abnormality. However, the causal genes and thus the mechanisms directly involved in their pathologies are not clear, because gross rearrangements of the number of chromosomes, which contain a large number of genes, occur in these diseases.

The research group of associate professor Hisao Moriya previously developed an experimental technology designated "genetic Tug-Of-War (gTOW)", by which we can measure how much the copy number of a gene can increase without disrupting the cellular function (the copy number limit of a gene). The group uses the budding yeast *Saccharomyces cerevisiae* as the simplest model eukaryote, which basically has the same cellular structure as human cells. Using the gTOW method, the group recently has measured the copy number limits of all protein-coding genes (about 6000 genes) in *S. cerevisiae,* as the first time ever for any organisms (Figure 1).

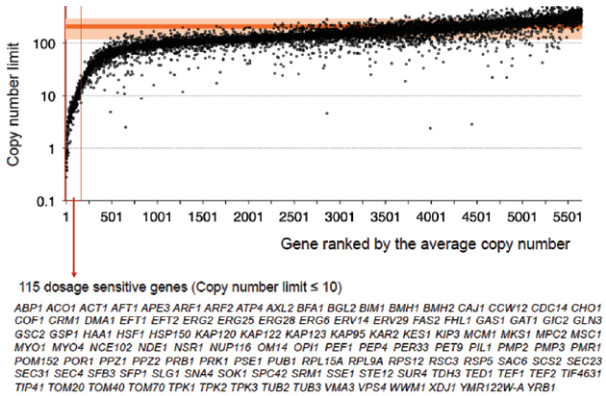


Figure 1. Copy number limits of all genes in the budding yeast More than 80% of the genes have the copy number limits >100. On the other hand,there are 115 genes that have the copy number limits <10. The group named these genes "dosage sensitive genes".

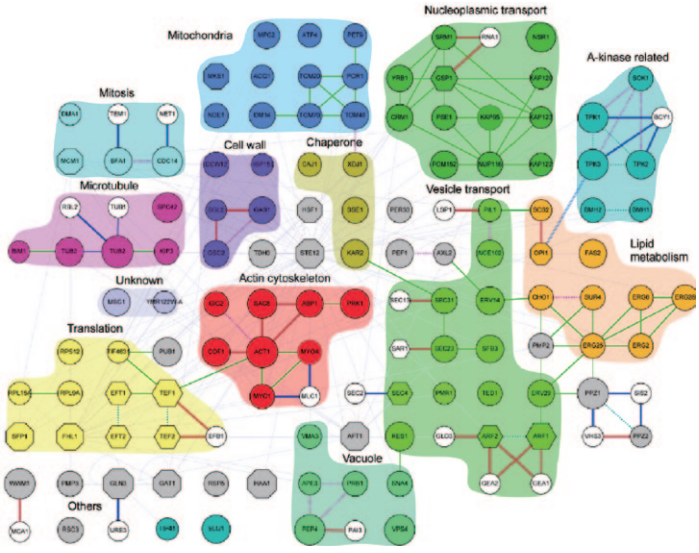


Figure 2. Interactions of 115 dosage sensitive genes identified in this work 115 dosage sensitive genes significantly contain genes involved in cytoskeletal organization and intracellular transport. The increase of these genes cause cellular dysfunction due to "protein burden" and "stoichiometry imbalance".

As the result, the group first discovered that >80% of the genes have the copy number limits >100. This indicates that the cellular system is surprisingly robust against the increase in the copy numbers of most genes. The group also identified 115 genes with the copy number limits of 10 or less (here we designate these genes "dosage sensitive genes")(Figure 1 and Figure 2). Identified genes significantly contained genes involved in cytoskeletal organization and intracellular transport. They also tended to encode proteins relatively abundant in the cell, and proteins function as complexes with other proteins.

From these characteristics, the group assumed that the burden of the turnover of unnecessary proteins toward basic cellular functions (protein burden), and the dosage imbalance within protein complexes (stoichiometry imbalance) caused the strong adverse effects produced by the dosage sensitive genes. With additional gTOW experiments, the group further confirmed these assumptions were true. Finally the group proposed a hypothesis that the dosage balances of dosage sensitive genes determine the composition of chromosomes. The hypothesis explains how compositions of chromosomes of current organisms have been determined during evolution, and how they are stably maintained.

To understand what happens when the copy number of a dosage sensitive gene increases in yeast is to understand the pathologies of Down syndrome and cancer, in which the increase in chromosome numbers are involved. In addition, it is known that malignant cancer cells can avoid the adverse effects brought by the increase in the number of chromosomes. The group believes that the mechanisms to avoid the adverse effects are revealed by identifying the mutants that tolerate the copy number increases of the dosage sensitive genes in yeast.

Identification of dosage-sensitive genes in Saccharomyces cerevisiae using the genetic tug-of-war method
Koji Makanae, Reiko Kintaka, Takashi Makino, Hiroaki Kitano, Hisao Moriya
Genome Research 2013 23(2) 300-311

Research Core for Interdisciplinary Sciences, Okayama University, Okayama 700-8530, Japan
http://tenure5.vbl.okayama-u.ac.jp/HMlab/

Research Highlights

Vesicular Neurotransmitter Transporters: Review article on novel approach by "Clean Biochemistry".

Vesicular storage and subsequent exocytosis of neurotransmitters are the key processes of chemical transmission. Vesicular neurotransmitter transporters play an essential role in this process and are responsible for loading the signaling molecules into secretory vesicles.

Although techniques such as gene disruption and gene targeting enabled us to conduct detailed analysis of the physiological functions of the vesicular neurotransmitter transporters, the molecular mechanisms of the vesicular loading are still not well understood because of the lack of innovative techniques to measure transport activity. Currently, heterologous expression in *Xenopus* oocytes and mammalian cells is widely used to measure the transport activity. However many factors such as presence of other proteins, targeting errors, difficulties to control driving forces, and the concentration of transporters hampers quantitative assays.

To resolve these problems, Hiroshi Omote and Yoshinori Moriyama developed the novel approach known as 'clean biochemistry', which includes overexpression of wild and mutant recombinant transporters in insect cells or bacteria, purification, and reconstitution in liposomes. Yoshinori's measurement of the activity of all transporters under any type of driving force, providing a powerful tool for indentifying novel vesicular transporters and for analyzing the molecular mechanisms of these transporters in detail. Successful applications of this approach are described in the paper and the authors believe that 'clean biochemistry' may open new fields in chemical transmission.

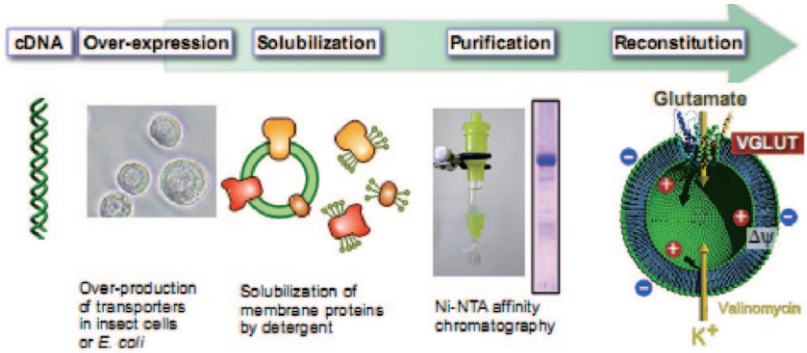


Figure : The 'clean biochemical' approach

Reference:

- Authors: Hiroshi Omote and Yoshinori Moriyama
- Title of original paper: Vesicular Neurotransmitter Transporters: An Approach for Studying Transporters With Purified Proteins
- Journal, volume, pages and year: *Physiology*, 28: 39–50, 2013.
- Digital Object Identifier (DOI): 10.1152/physiol.00033.2012
- Affiliations: Okayama University, Department of Membrane Biochemistry. Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan.

Intellectual Property and Enterprise

Improved synthesis of graphene oxide and its application to nanocomposites

Research Core for Interdisciplinary Sciences
Assistant Professor, Yuta Nishina

We have developed a method for the rapid preparation of graphene oxide (GO)—a strategically important material for future technology (Fig.1).

The most common method for synthesizing GO is the Hummers' method (oxidation with $KMnO_4$ and $NaNO_3$ in concentrated H_2SO_4), which requires a long reaction time and large amounts of reagents. In our research found that the microwave irradiation of natural graphite flakes before the oxidation step improved the efficiency of the oxidation process. This facile method provides a greater amount of GO compared with the original Hummers' method. We expect our rapid synthesis method based on microwave irradiation to make a major contribution to the large-scale production of GO.

Patent information: Japanese patent No.5098064

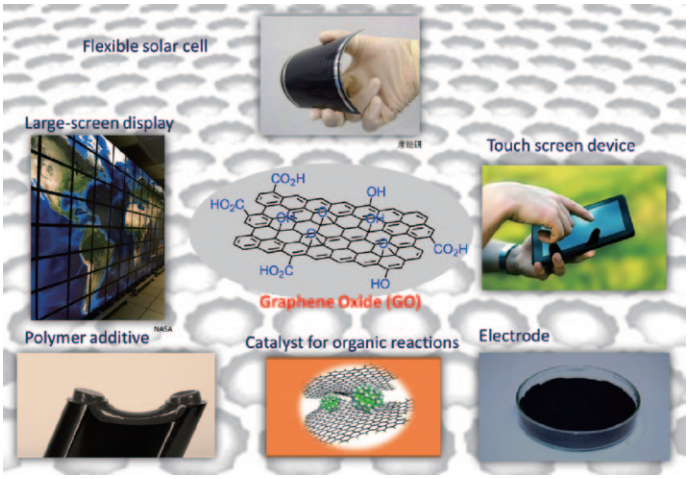


Fig. 1. Promising applications of graphene oxide

Graphene is a promising support material for Pt nanoparticles, which triggered much interest in metal/graphene composites. In some cases, however, graphene-supported metal species are not preferred, because the interaction between the metal particles and graphene is quite weak due to the graphene itself is being relatively chemically inert due to the strong sp^2 and π binding between carbon atoms in the graphene plane. Consequently, the metal nanoparticles are mobile on graphene, which leads to limited applications of metal/graphene composites. It has been proposed that defects or mechanical strain in graphene can significantly increase the chemical reactivity of graphene itself and also enhance the interaction between metal nanoparticles.

Therefore, GO offers significant advantages for the synthesis of composites with inorganic materials and organic polymers due to its large amounts of oxygen functionality. As an application of our GO, metal nanoparticles were supported on its surface. We succeeded to synthesize Pt, Pd, Rh, Ir, Cu, etc. nanoparticles on GO via solution processes (Fig. 2). Controlling the degree of oxidation of GO and the oxidation state of metal species will offer a wide range of applications of metal/GO composites such as electrodes, fuel cell catalysts, and catalysts for chemical synthesis. We showed that the Pd/GO composite exhibited superior catalytic activity in selective hydrogenation and cross coupling reactions (Fig.3).

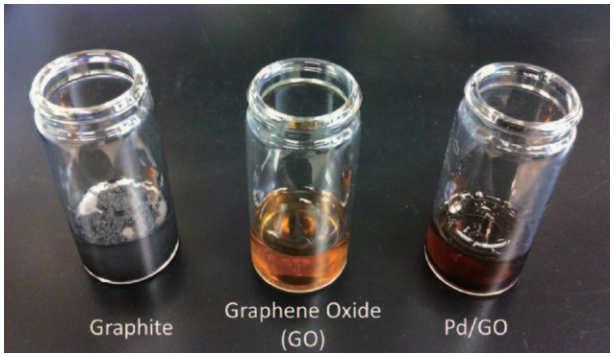


Fig. 2. Pictures of insoluble graphite (left), aqueous solution of GO (middle), and aqueous solution of Pd/GO composite.

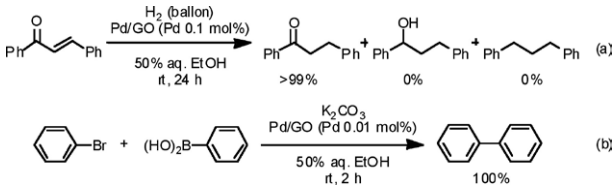


Fig. 3. Pd/GO-catalyzed (a) selective hydrogenation of a multi-functionalized organic compound and (b) Suzuki-Miyaura cross coupling reaction.

Japanese patent application No.2012-201088

Assistant Professor Yuta Nishina website
http://www.tt.vbl.okayama-u.ac.jp/en/

Topics : Letters from alumni

Dr. Md. Sohel Rana
Jahangirnagar University, Bangladesh
Professor, Department of Pharmacy

It was April 1998 when I had the privilege of being at Okayama University to pursue my Ph.D degree in Pharmaceutical Sciences under the supervision of Professor Keietsu Tamagake. I recall that in addition to focusing on my research work, I also enjoyed every moment of the experience of being a student at Okayama University. I still have fond memories of playing tennis with faculty members and games of inter-department softball with friends.

Members of my research group at an outdoor gathering

However, my most pleasant memories were with my sensei, Professor Tamagake who used to take us out on trips. We will never forget the memories of Disney land or Tokyo Tower, the Golden Temple in Kyoto, deer in Nara, sand beaches or 'nashi garden' in Tottori. But my greatest recollection of my time at Okayama University was the birth of my daughter there. The lovely moment of seeing the new born baby in Saisekai Byoin is still fresh in my mind.

My family visiting a coral island in Bangladesh

After coming back to Bangladesh in March 2002, I resumed teaching at the Pharmacy Department of Jahangirnagar University. I have had several administrative responsibilities, including being the Chairman of the Department!

Pharmacy as a profession was not very widespread and popular when I took the helm. I was given the ominous job of making a popular profession out of it in every aspect. I am currently supervising a research lab where more than 35 students are working on two existing projects, namely, Formulation Development & Drug Interaction and Natural Products Research.

Japan is giving tremendous support in these developments. We also have collaborative research programs with universities in South Korea, Australia, and England. Every year, many students from our lab pursue undergraduate and graduate studies in these countries.

I sincerely hope that we can continue to grow strong bonds with Okayama University to create more opportunities for exchange and collaborative research programs.

Further information:

Jahangirnagar University, Savar, Dhaka-1342, Bangladesh

http://www.juniv.edu/

Topics : Okayama Travelogue

Institute for the Study of the Earth's Interior (ISEI), Okayama University

ISEI is located in Misasa, a well-known hot-spring resort, in Tottori prefecture near the west coastline of the main island (Honshu) facing the Japan Sea.

The mission of the Institute for Study of the Earth's Interior (ISEI) is to understand the origin, evolution, and dynamics of the Earth by applying advanced experimental and analytical techniques.

The state of the art experimental and analytical facilities and expertise include ultrahigh-pressure and -temperature devices and comprehensive geochemical and geochronological techniques for elucidating the mysteries of the Earth and other planets.

Internationally recognized research at ISEI includes the analysis of fine particles from the Itokawa asteroid brought to Earth by Japan's Hayabusa space probe [1], and high pressure and temperature experiments simulating deep part of the Earth's mantle.

More recently, the ISEI has initiated analysis on the 'Chelyabinsk meteor' that made a spectacular landing in Chelyabinski in the southern Ural region of Russia on 15 February 2013.

ISEI is a leading joint use collaborative research institute, and offers opportunities of collaborative research for scientists and students from around the world. ISEI has a five year graduate course, and is looking for prospective students. In summer, the ISEI conducts an international student internship program (this year's application is closed). Check the institute's website for more information.

The Okayama University Institute for Study of the Earth's Interior (ISEI)
Misasa Spa: http://spa-misasa.jp/eng/index.html

Pieces of the Chelyabinsk meteorite that are being analyzed at ISEI. The meteorite entered Earth's atmosphere on 15 February 2013 in Russia's Ural mountains.

A clean room at ISEI.

1. Okayama e-Bulletin Sept 2012, Evolving planets get a bumpy ride,
http://www.okayama-u.ac.jp/user/kouhou/ebulletin/research_highlights/vol1/highlights_001.html

Further information:

Website of the Okayama University Institute for Study of the Earth's Interior (ISEI):
http://www.misasa.okayama-u.ac.jp/eng/

Topics : Club Activities

Okayama University Aikido Club
Self-defense with fighting

"I first started Aikido because I wanted to wear the hakama," says Kousuke Ootani, a third year history student and senior member of the Okayama University Aikido Club. "The hakama is the traditional Japanese costume worn by practitioners of martial arts as well as for formal ceremonies such as weddings."

Members of the Okayama University Aikido during a practice session.

The Okayama University Aikido Club was established 36 years ago and currently has 16 members from a wide range of departments. "Student disciplines include law, pharmacy, and economics," explains Ootani. "We also have international students from India, Madagascar, and USA; we are a lively group." The Okayama Aikido Club is a member of the 'Aikikai Foundation' and follows the ideals of Morihei Ueshiba who created the martial art during the first half of the 20th century.

Practicing with wooden swords.

Regular practice is an essential part of club activities. "We practice two hours per day, four days per week," says Ootani. "Our early morning sessions during the winter months—'cold practice'—are particularly challenging."

Intriguingly, the Okayama University Aikido Club takes part in national competitions in which there is no direct contest between participating groups. "The so called 'Aikido Enbu Taikai' are major annual Aikido gatherings where we exhibit our abilities by pairing with members of our own club," explains Ootani. "There are no inter-club competitive matches .There is no fighting, which reflects the spirit of Aikido."

The Club welcomes new members all year round. More information can be found at the club's website.

Okayama University Aikido Club
http://okaaiki.kt.fc2.com/bukatsu.html

Aikikai Foundation
http://www.aikikai.or.jp/eng/

