



RIKEN

Omics Science Center

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Dr. Alexander Lezhava giving instruction in SmartAmp (SMAP)



Real time display of SmartAmp



OSC laboratory tour

Events

Dutch Healthcare Innovation Mission to Japan 2008

Report by My Persson

The Dutch Healthcare Innovation Mission is an annual event for the top of the Dutch health care sector. The mission is supported by the Dutch Ministry of Health, Welfare and Sport. Previous healthcare missions were the India ICT & Healthcare Innovation Trip in January 2006 and the Redefining Health care; Quality and Innovation Mission to the U.S in June 2007.

On November 26 the Dutch Healthcare Delegation consisting of 11 participants from the highest level within the healthcare market in The Netherlands visited the OSC. All the delegates were either Chairman of the Board of the largest hospitals, health insurance firms or affiliate organizations in Holland. Also one participant, Diana Monissen, was Director General Curative care of the Ministry of Health, Welfare and Sport.

The core focus of the Dutch Healthcare Innovation Mission to Japan was to enhance and stimulate healthcare improvement and to exchange ideas and experiences with innovative initiatives and institutions in Japan, such as the OSC.

The delegation were greeted by Dr. Tomoya Ogawa, the director of RIKEN Yokohama Institute, and given a brief introduction to RIKEN. After the introduction the director of OSC, Dr. Yoshihide Hayashizaki, gave a seminar about the SmartAmp (SMAP), which is DNA amplification assay to detect single nucleotide differences in the human genome from a drop of blood. Dr. Alexander Lezhava, Dr. Atsuko Katayama and Yuri Ishizu collected blood samples from members of the delegation in order to make a SmartAmp-test and analysis in real time. This test turned out to be a great success and created a great interest for the SmartAmp technique. All participants eagerly wanted to give blood and held vivid discussions during the testing as well as during the seminar. The results from the SmartAmp-test were presented at the end of a lab tour of the south building held by Dr. Hayashizaki.

The learning's and ideas from the healthcare's mission will be shared through an event on March 9, 2009 in Amsterdam. The whole top of the health sector will be invited for this event and a total of 150 executives are expected to attend. The event consists of a seminar with speakers on quality and innovation followed by a dinner with theme discussions at each table. At this event the delegation will also publish a Japan Paper on their findings and experiences. All delegation members will contribute through a report on a specific theme or based on a learning following a specific visit. One of the themes will be the advanced medical research done in Japan and how such centers can be set-up in Holland as well.

BMB2008

Report by Kengo Usui

The Biochemistry and Molecular Biology 2008 (BMB2008, Molecular Biology Society of Japan annual meeting 2008) was held in December 9-12, 2008, at Kobe Port Island, Japan. I presented the research of 'Nanolego', creation of self-assembling de novo fusion protein (supported by JST/CREST, 2003-

2008), in Symposium 1S8, "Approaches from molecular biology to post-nanotechnology". The symposium was organized by the members of the previous Kaya-CREST young researcher workshop, and the speakers consisted of six former CREST researchers and three guests. The aim of this symposium was to discuss the integrated studies for nano-biology extending into several research fields; biology, organic chemistry, physics and mathematics.

Speakers in Symposium 1S8

- Sano, K. (Mol. & Sys. Life Sci. Unit, RIKEN)
The role of molecular biology on the development of nano-devices by using self-organization ability of biomolecules.
- Usui, K. (OSC, RIKEN)
Creation and development of biological protein-based self-assembling molecules, 'Nanolego'.
- Yoshizawa, M. (Chemical Resources Lab., Tokyo Inst. of Tech., JST-PRESTO)
Bio-inspired nanotechnology based on self-assembled molecular system.
- Gouda, M. (Div. of Research and Development, CARNA BIOSCIENCES, Inc.)
The mobility shift assay uses a microfluidic technology for drug discovery.
- Okumura, Y. (Dept. of Sci., Osaka Univ.)
Topological gels by figure-of-eight cross-links.
- Aono, M. (Flucto-Order Functions Lab., ASI, RIKEN)
Amoeba-based biocomputing exploiting multilevel self-organization.
- Takaoka, Y. (LAGS, CGI Center, Kobe Univ. Grad. Sch. Med.)
Induction of proliferative reaction in satellite cell (skeletal muscle stem cell) by using femtosecond laser-induced shockwave.
- Hosokawa, Y. (Grad. Sch. Mat. Sci., NAIST)
Novel cell manipulation method using femtosecond laser-induced shockwave and its application for life science.
- Ito, A. (Div. of Mol. Pathol., Inst. of Med. Sci., Univ. of Tokyo)
New method for measurement of cell-cell adhesion strength assisted by femtosecond laser.

'To gaze at the stars is to gaze at life'

Report by Emi Ito

A special event 'To gaze at the stars is to gaze at life' was held at RIKEN Yokohama Institute December 11-12, 2008, and the director of the OSC, Dr. Yoshihide Hayashizaki, was a guest speaker in the 'Live Science Show'. The show was hosted by Dr. Toshikazu Ebisuzaki, who is a good friend of Dr. Hayashizaki from college, from RIKEN Computational Astrophysics Laboratory.

The audience was enjoying a virtual tour to the end of the universe in the 3-dimensional movie, 'Cosmic Discovery' produced by Dr. Ebisuzaki, accompanied with comical chatting between Dr. Ebisuzaki and Dr. Hayashizaki. The virtual tour then brought the audience to the inside of a cell in the 3D movie 'Beyond DNA' produced by Dr. Hayashizaki and showed the process in which RNA is transcribed from DNA and a protein is translated from the RNA. These 3D movies are being shown at the Synra Dome in the Science Museum.

Internal Activities

The 4th CWG

Report by Charles Plessey

"Chat with guest" is a newly introduced activity at the OSC, where junior researchers and technicians are given the opportunity to talk informally to



'Live Science Show'

visitors of the OSC. The 4th CWG took place on November 26th, where Prof. Andrea Ballabio, director of the Telethon Institute of Genetics and Medicine (TIGEM) of Naples was here to give a seminar.

A recurrent theme of the discussion was how to transform research results into therapies. Prof. Ballabio gave us his point of view of institute director and explained us how he organized the TIGEM to get the right balance of projects oriented on discovery, technology and therapy, in order to conduct research from the identification of a disease to the development of a potential cure. He told us about the necessity for institutes with a medical goal like TIGEM to equip themselves with modern instrument – yesterday micorarrays, today next- generation sequencers – during the time where commercial companies cannot propose equivalent services. It is even sometimes necessary to create a company when no service is available, and this is something he did for further developing the potential therapies that were tested on mice models created at the TIGEM.

Lab Tours

- Dec. 9, 2008 Life Sciences Division of Ministry of Education, Culture, Sports, Science and Technology,
- Dec. 16, 2008 Health Sciences University of Mongolia & Saynshand Medical University
- Dec. 17, 2008 Shinagawa Joshi Gakuin
- Dec. 19, 2008 Shimane Masuda High School (Super Science High School)

Publications

1. Mizuki Nishimura, Yukari Matsuo, Tohru Kobayashi, Jun Kawai, Yoshihide Hayashizaki. Dynamics of Ablation Plasma Produced with a Femtosecond Laser Pulse in Electric Fields, *Applied Surface Science*, **1**, 1-1 (2008)
2. "Oliver Hofmann, Otavia Caballero, Tzeela Cohen, Ramon Chua, Christopher Maher, Sumir Panji, Ulf Schaefer, Minna Lehvaslaiho Adele Kruger, Brian Stevenson, Piero Carninci, Yoshihide Hayashizaki, Victor Jongeneel, Andy Simpson, Lloyd Old Winston Hide ". Genome-wide analysis of cancer/testis gene expression, *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, **105**, 20428-20433 (2008)
3. Piero Carninci, Matthias Harbers. Next-Generation Sequencing Methods Drive new Discovery in Transcriptome Research, *BIOforum Europe*, , - (2008)
4. Masami Matsumura. 分子細胞生物学辞典 第2版, 分子細胞生物学辞典 第2版, **1**, 1-1 (2008)

Presentations

English

1. Kawai J. Transcriptome analysis - a way to explore the genome network, The International Symposium on Applied Genomics 2008, グランドアーク半蔵門, December 4, 2008
2. Carninci P. Decoding the complexity of mammalian transcriptome, RAT GENOMICS & MODELS, Welcome Trust Conference Centre, Hinxton, December 3, 2008
3. Plessy C., Simone R., Bertin N., Pascarella G., Akalin A., Olivarius S., Gustincich S., Carninci P. Analyse simultanée de tous les promoteurs du

génome avec nanoCAGE (Simultaneous analysis of all promoters with nanoCAGE), Journée Francophone de la recherche 2008, Institute of Industrial Science (東京大学生産技術研究所), November 28, 2008

Japanese

1. Hayashizaki Y. SMAP--新規迅速DNA診断法, 東大セミナー, , December 22, 2008

2. Hayashizaki Y. 次世代シーケンサーを用いた RNA 研究の最前線と医学応用, がん検診認定医制度 習熟講習会, , December 20, 2008

3. Lezhava A. Rapid screening of clinical samples for codon-specific mutations by the Smart Amplification Process (SMAP-2), 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), 神戸, December 18, 2008

4. Kawaji H. A visualization tool of a spreadsheet-based description of experimental processes, The 2008 Annual Conference of the Japanese Society for Bioinformatics (JSBi2008), Senri Lifescience Center Building, Senri-Chuo, Toyonaka, Osaka, December 15, 2008

5. Saeki Y., Endo T., Ide K., Nagashima T., Yumoto N., Toyoda T., Suzuki H., Hayashizaki Y., Sakaki Y., Hatakeyama M. リガンド特異的な AP-1 転写因子による MCF-7 細胞の分化制御機構 Ligand-specific sequential regulation of AP-1 transcription for differentiation of MCF-7 cells, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), 神戸ポートアイランド, December 11, 2008

6. Maeno E., Hayashizaki Y., Yasuda J. Functional analysis of miRNA related with metastasis in melanoma (悪性黒色腫の転移に関与する miRNA のスクリーニングと機能解析), BMB2008 (Biochemistry and Molecular Biology, 2008: 第 31 回日本分子生物学会年会・第 81 回日本生化学学会大会 合同大会), 神戸ポートアイランド, December 9, 2008

7. Daub C., Forrest A., Hashimoto T., Hayashizaki Y., Takahashi Y., Yasuda J., Maeno E. ヒト肺がん染色体コピー数異常領域に存在する miRNA の機能解析, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (BMB2008, Molecular Biology Society of Japan annual meeting 2008), 神戸, December 9, 2008

8. Kubosaki A., Tomaru Y., Tagami M., Arner E., Miura H., Suzuki T., Suzuki M., Suzuki H., Hayashizaki Y. Genome-wide Analysis of EGR1 Binding Sites by ChIP-chip, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), 神戸, December 9, 2008

9. Hayashizaki Y., Kawaji H., Kawano M. 世代を越えて機能する RNA の同定に向けて, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), 神戸ポートアイランド, December 9, 2008

10. Usui K. Creation and development of biological protein-based self-assembling molecules, "Nanolego", 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), Kobe Port Island, December 9, 2008

11. Kimura Y., Kondo S., Katayama A., Lezhava A., Mitani Y., Hayashizaki Y.

Simulation of the Smart Amplification Process (SMAP), 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), Kobe, December 9, 2008

12. Ando Y., Nishimura M., Kobayashi T., Matsuo Y., Tomaru Y., Lassmann T., Kawai J., Hayashizaki Y. Application of fs-TOF MS for analyzing DICER function, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), Kobe, December 9, 2008

13. Katayama A., Aomori T., Kawai Y., Ishida T., Mitani Y., Kohnke H., Wadelius M., Lezhava A., Hayashizaki Y. Rapid SNP detection of the cytochrome P450 (CYP) 2C9 and the vitamin K oxide reductase complex subunit 1 (VKORC1) gene for the warfarin dose adjustment by SMart-Amplification Process, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), Kobe, December 9, 2008

14. Endo R., Kiso M., Tamura D., Victor S., Lezhava A., Hayashizaki Y., Kawaoka Y. Development of influenza A RT-SMAP for rapid diagnosis of Oseltamivir (Tamiflu) resistant mutants, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), Kobe, December 9, 2008

15. Furuno M., Yabukami H., Maruyama K., Hayashizaki Y. Post-transcriptional gene regulation in cellular components through cell differentiation, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), Kobe Port Island, Japan, December 9, 2008

16. Ogawa C., Usui K., Ito F., Itoh M., Hayashizaki Y., Suzuki H. snRNP 合成における SMN 複合体コンポーネントの相互作用平衡関係について, BMB2008 (第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会), 神戸ポートアイランド, December 9, 2008

17. Ishida Y., Takeda S., Hamazato F., Koike A., Otomo J., Tagami M., Kishima M., Morita R., Iwayanagi T. 酵母ツーハイブリッド法による大規模ヒト転写調節因子ネットワーク構築, BMB2008, 神戸ポートアイランド, December 9, 2008

18. Bertin N., Hayashizaki Y., Trinh Xuan H., Katayama S., Ninomiya N., Ogawa C., Suzuki H., Usui K. cDNA リソースを用いた哺乳動物細胞 2 ハイブリッド法による転写因子間相互作用の解析, 第 31 回日本分子生物学会・第 81 回日本生化学学会大会 合同大会 (Biochemistry and Molecular Biology, 2008, BMB2008), 神戸ポートアイランド, December 9, 2008

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21. Tsunekawa K., Yanagikawa M., Aoki T., Morimura T., Nara M., Ogiwara

M., Kotajima N., Amaya H., Mitani Y., Hayashizaki Y., Muramatsu M., Murata M. 地域住民における2型甲状腺ホルモン脱ヨード酵素遺伝子多型の糖代謝に及ぼす影響の検討, 第55回日本臨床検査医学会学術総会, 名古屋, November 29, 2008

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