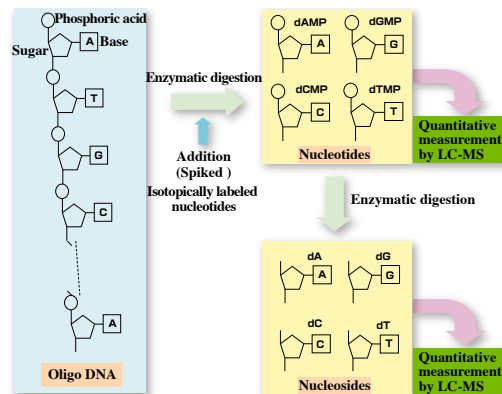


DNA quantitation by isotope-dilution mass spectrometry

Development of method for accurate quantitation of DNA and the application to the development of DNA reference material

In recent years, the demand for quantitative measurement of DNA has been increased in the field beyond basic biology, such as food analysis and clinical diagnosis. Currently, real-time PCR, DNA microarray and UV absorption are utilized for the quantitation, however, the accurate quantitative measurement for DNA has not been established, because of the lack of well characterized reference materials. We have developed an accurate quantitative analysis of DNA using isotope-dilution mass spectrometry (ID-MS) for the development of DNA reference materials. In this study, 20-mer oligo DNA was used for the analyte, which was spiked with isotopically labeled nucleotides, and digested enzymatically. The resulted nucleotides and nucleosides mixtures were measured by LC-MS. The measured concentration of the analyte oligonucleotide was compared with other quantitation methods. The accuracy of this method has also been verified by the inter-laboratory comparison based on the CIPM/CCQM pilot study P54.1.



Quantitative measurement of oligo DNA by using ID-MS

Tomoya Kinumi
t.kinumi@aist.go.jp

Shin-ichiro Fujii
s-fujii@aist.go.jp

Metrology Institute of Japan

AIST TODAY Vol.8, No.3 p.29 (2008)

In Brief

Fourth Biomass-Asia Workshop

The Fourth Biomass-Asia Workshop was held from November 20 to 22, 2007 at Shah Alam, Malaysia. The workshop was jointly organized by Malaysia and Japan. Malaysian organizers are Ministry of Energy, Water and Communications (MEWC), Ministry of Science, Technology, and Innovation (MOSTI), Ministry of Natural Resources and Environment (NRE), and Ministry of Plantation Industries and Commodities Malaysia (MPIC). Japanese organizers are Ministry of Education, Culture, Sports, Science and Technology (MEXT), Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Economy, Trade and Industry (METI), and Biomass-Asia Research Consortium.

Biomass-Asia Workshop, the first of which was held in Tokyo and Tsukuba in 2004, has been held annually in Thailand, Tokyo and in 2007, in Malaysia. Over 250 people



Workshop site

participated from twelve countries including ten Asian countries.

Following opening remarks by Dr. Tatsuo Katsura, the then Senior Vice-President, AIST, and Mr. Kunio Oguri, Deputy Director General, Agriculture, Forestry and Fisheries Research Council Secretariat, special lectures were delivered by Prof. Kenji Iiyama, President, Japan International Research Center for Agricultural Sciences, and Mr. Lim Keng Yaik, Minister of MEWC. In the technical session, based on the result of study at the three prior workshops, there was active discussion on regionally adaptable model of sustainable biomass utilization technology in Asia. In the last session, a direction was charted for the development of utilization technology in three models, ASEAN island model, ASEAN continental model, and China model. The next workshop was agreed to be held in China, and the two day workshop came to a close. At the evening reception, there were speeches by MEWC Secretary-General and Mr. Masahiko Horie, Japanese Ambassador to Malaysia. On the last day, there were separate technical tours to palm oil mill facility and to power generating facility from waste paper.

CAS-AIST-NEDO Workshop on Fuel Cells and Hydrogen

CAS-AIST-NEDO Workshop on Fuel Cells and Hydrogen was held from November 11 to 13, 2007 at Dalian Institute of Chemical Physics (DICP) of Chinese Academy of Sciences(CAS). This was the fourth of a series of workshops held to find specific collaborative tasks under the Comprehensive MOU concluded between AIST and CAS in May, 2004. The themes are all related to environment and energy because these fields are considered extremely important in constructing a sustainable recycling society which is an urgent global issue. New Energy and Industrial Technology Development Organization (NEDO), which has much to do with these themes, has also joined the other two organizations and has co-hosted the workshops.

At the workshop, on various technological issues concerning different types of fuel cells and hydrogen energy, overall activities, projects and topics were introduced; by

research institutes affiliated to CAS, mainly DICP, on the Chinese side, and by AIST, NEDO, and universities on the Japanese side; and active discussions were held. On the last day, there was a lab tour of DICP, and much information on the Chinese situation concerning the relevant areas was obtained.



Participants from both countries that attended the workshop

AIST Contribution to Rare Metal Diplomacy with Southern Africa -Accompanying Mr. Akira Amari, Minister of Economy, Trade and Industry to the Republic of South Africa and the Republic of Botswana-

In order to develop friendly relations with African countries and to promote resource related diplomacy of the Japanese government, Minister Amari, Ministry of Economy, Trade and Industry (METI) visited the Republic of South Africa and the Republic of Botswana from November 14 to 17, 2007, held talks with the presidents and ministers of both countries, and returned to Japan successfully concluding the trip.

The then Senior Vice-President Tatsuro Katsura, Vice-President Masakazu Yamazaki, and Research Coordinator Eikichi Tsukuda of AIST traveled with the Minister. Honored with the presence of Minister Buyelwa Sonjica of Ministry of Minerals and Energy of South Africa and Minister Amari, AIST, Japan Oil, Gas and Metals National Corporation (JOGMEC) and Council for Geoscience of South Africa concluded a Comprehensive MOU on November 16 at the Department of Minerals and Energy in Pretoria. South Africa has abundant resource reserves of rare metal, also called “vitamin of industries”, which is vital for high-tech products, and the MOU was concluded with an eye on securing rare metal supply. Specifically, what is being considered is conducting cooperative geological survey based on new technology of rare metal centering on rare earth. AIST is going to cooperate with the geological survey mainly by scientifically clarifying and grasping the components and nature of mineral deposits which is the basis of exploration technology. Presently, discussions have begun among the three organizations concerning specific research cooperation along the outline of the MOU.

On November 16, a MOU was concluded between JOGMEC and Geological Survey of Botswana at the Republic of Botswana. This is to strengthen relationships with this



country which has the headquarters of Southern African Development Community (SADC) made of 14 countries. As the observation data of resource exploration satellite information of Japan (ASTER and PALSAR) will be used for the benefit of the 14 member nations of SADC, AIST is asked by JOGMEC for cooperation with such technology as GEO Grid.

On November 17, the party moved to South Africa, and Minister Amari exchanged views with the CEOs of Anglo Platinum. Then the party toured the platinum mine of Lonmin company, where the then Senior Vice-President Katsura and Research Coordinator Tsukuda grasped the situation of mineral related companies of South Africa from expert viewpoints.

This visit to South Africa and Botswana by Minister Amari was accompanied by people related to the government, private companies, AIST, and JOGMEC, and demonstrated their high level of interest in South Africa.

Presentation of GEO Grid at Fourth Earth Observation Summit

The Fourth Earth Observation Summit, sponsored by Group on Earth Observations (GEO), was held from November 28 to 30, 2007 at Cape Town. Representatives of over 100 member governments and international organizations discussed climate change by global warming as well as the construction of an international monitoring system against natural disasters, and Cape Town Declaration which advocates strengthening of



Then GTRC Director Sekiguchi explaining GEO Grid to MEXT Minister Tokai

international cooperation was adopted. The Japanese government organized a delegation with Minister Kisaburo Tokai, Ministry of Education, Culture, Sports, Science and Technology (MEXT) as the head (secretariat: Ocean and Earth Division, Research and Development Bureau, MEXT), and the then Director Satoshi Sekiguchi of AIST Grid Technology Research Center (GTRC) participated as a member of the delegation. At the attached exhibition, state of progress of the formulation of Global Earth Observation System of Systems (GEOSS), and the contributions of each organization were exhibited. From AIST, GEO Grid (Earth Observation Grid), chosen as one of the first 100 steps to GEOSS (published in a document of the same name), was presented with demonstrations. Geo Grid is an IT framework which promotes information sharing of data concerning cross-border earth observation and cooperation, and it attracted interest of many participants.

MOU Follow-up Workshop between Department of Biotechnology, Ministry of Science and Technology of India and AIST

MOU follow-up workshop / symposium / bilateral meeting between Department of Biotechnology (DBT), Ministry of Science and Technology of India and AIST were held from January 22 to 23. This is based on the Comprehensive MOU concluded in February 2007 which advocates research cooperation in three topics: glycoengineering, cell engineering, and bioinformatics.

As the first cooperative project, an international symposium related to cell engineering was also held, and over 70 researchers from 8 countries including India participated.

At the bilateral meeting with DBT, three research units and International Affairs Department of AIST participated, and discussions were held in view of specific

research cooperation. As a result, the structural difference between DBT, a government ministry, and AIST, a research institution, was confirmed, and specific collaborative research themes related to bioinformatics were also suggested. Hereafter, it was agreed, interaction among researchers will be promoted and individual collaborative research themes will be launched under the MOU.



Lecture by DBT Joint Secretary N.S. Samant

AIST
TODAY
International Edition
No.28 Spring 2008

 **AIST** NATIONAL INSTITUTE OF
ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

Publication Office, Public Relations Department
National Institute of Advanced Industrial Science and Technology (AIST)

AIST Tsukuba Central 2, 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568, Japan
TEL: +81-29-862-6217 FAX: +81-29-862-6212 Email: prpub@m.aist.go.jp URL: <http://www.aist.go.jp/>

- Reproduction in whole or in part without written permission is prohibited.
- Contribution and remarks from other organizations don't represent with AIST's views.