Mucopolysaccharidosis and Isoflavones

Professor, Medical Education Development Center (MEDC), Gifu University

Yasuyuki Suzuki
3 ▶ To hold an “International Congress on Nutrition and Integrative Medicine”
Developed from the International Symposium of AHCC Research Association
—Report on holding of Executive Meeting—

4 ▶ Contribution: Mucopolysaccharidosis and Isoflavones
Professor, Medical Education Development Center (MEDC), Gifu University
Yasuyuki Suzuki

6 ▶ Dr. Toshinori Ito Presents Sixth Annual UC Davis Kosuna Distinguished Lecture
Research Professor, Department of Nutrition, UC Davis
Robert Hackman

7 ▶ Reports on Academic Meetings and Exhibitions
- ifia/HFE JAPAN 2010
- The 59th Annual Meeting of the Japan Society of Acupuncture and Moxibustion, Luncheon Seminar

7 ▶ Book Review
Biotechnology in Functional Foods and Nutraceuticals

8 ▶ The Latest Publications and Academic Presentations
8 ▶ Editorial Postscript

*This English Edition is a translation of the newsletter published in Japanese on July 12, 2010

Cover Photograph
17th International Symposium of AHCC Research Association (July, 2009)
To hold an “International Congress on Nutrition and Integrative Medicine”
Developed from the International Symposium of AHCC Research Association
- Report on holding of Executive Meeting -

To be further recognized as an international symposium

The Executive Meeting of the AHCC Research Association for this year was held on June 26.

During this meeting, discussions were held to decide a title for the research reporting session to make it more generally recognized as an international symposium, in order to internationalize the AHCC-related research reporting sessions and promote applied research in the area of integrative medicine of functional foods.

The Secretariat of the AHCC Research Association proposed the new title, "International Congress on Nutrition and Integrative Medicine," which is more inclusive than the conventional "International Symposium of AHCC Research Association."

Following the discussions, the name proposed by the Secretariat was passed unanimously. We shall use the new title from this year onward. In addition, in order to show the continuity as a reporting session of the AHCC Research Association, this year’s research reporting session will be titled “The 18th International Congress on Nutrition and Integrative Medicine.”

As in the past, the Congress will be sponsored by the METI (Ministry of Economy, Trade and Industry), Hokkaido. Based on the award-presenting program established last year, research fellowships will be awarded this year. The METI Hokkaido Director’s Award” will be the highest award for a research report.

We hope that this award-presenting program will encourage member researchers to conduct more researches.

Reelection of Directors of the AHCC Research Association

The term of a Director of the AHCC Research Association is two years and a reelection is due this year. Among the executive directors, three new executive directors were appointed with the resignation of the three previously appointed executive directors, Dr. Genichiro Nonaka, Dr. Michihiro Fujikawa and Dr. Buxiang Sun.

The Secretariat recommended the following three as the new executive directors: Dr. Yusai Kawaguchi (Director of Fujimoto Hospital), Dr. Jun Nishihira (Professor, Department of Medical Management and Informatics, Hokkaido Information University), and Dr. Mikio Nishizawa (Professor, Department of Biomedical Sciences, Ritsumeikan University). Their appointment was approved unanimously.

A new logo for the "International Congress on Nutrition and Integrative Medicine (ICNIM)"

The Earth in the center expresses a global image with integration of the West and the East and the entire Earth is surrounded by a crescent shape with an integral mark. In the colored version of the logo, the Earth in the center and the crescent Moon on the left are colored green, representing an image of health, while the integral mark and the crescent Moon on the right are colored in blue.

FY2009 activity report/FY2010 business plan

According to the provisions of the bylaws, the Secretariat presented an activity report for FY2009 and the FY2010 business plan and business expense plan, all of which were approved.

The activity report and business report approved at the Executive Meeting will be distributed to members of the AHCC Research Association along with this Newsletter. The issuance of this activity report and business plan will substitute for the holding of a general assembly: understanding by our members will be greatly appreciated.

Scene of discussions on a name of a new research reporting session
**Contribution**

Mucopolysaccharidosis and Isoflavones

Yasuyuki Suzuki
Professor, Medical Education Development Center (MEDC), Gifu University

---

**Table 1** Classification and characteristics of mucopolysaccharidoses

<table>
<thead>
<tr>
<th>Disease type</th>
<th>Synonym</th>
<th>Deficient enzyme</th>
<th>Genetic pattern</th>
<th>Accumulated mucopolysaccharide</th>
<th>Clinical findings</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Hurler/Scheie</td>
<td>α-L-iduronidase</td>
<td>AR</td>
<td>DS, HS</td>
<td>Bone/joint/connective tissue disorders, Neurological disorders</td>
<td>Enzyme replacement therapy, Bone marrow transplantation</td>
</tr>
<tr>
<td>II</td>
<td>Hunter</td>
<td>Iduronate-2-sulfatase</td>
<td>XLR</td>
<td>DS, HS</td>
<td>Bone/joint/connective tissue disorders, Neurological disorder</td>
<td>Enzyme replacement therapy</td>
</tr>
<tr>
<td>III</td>
<td>Sanfilippo</td>
<td>4 types of enzyme deficiencies</td>
<td>AR</td>
<td>HS</td>
<td>Neurological disorders</td>
<td>Genistein ?</td>
</tr>
<tr>
<td>IV</td>
<td>Morquio</td>
<td>Galactos-6-sulfatase</td>
<td>AR</td>
<td>KS</td>
<td>Cartilage disorders</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>Maroteaux-Lamy</td>
<td>Arylsulfatase B</td>
<td>AR</td>
<td>DS</td>
<td>Bone/joint/connective tissue disorders</td>
<td>Enzyme replacement therapy, Bone marrow transplantation</td>
</tr>
<tr>
<td>VII</td>
<td>Sly</td>
<td>B-glucuronidase</td>
<td>AR</td>
<td>DS, HS, CS</td>
<td>Bone/joint/connective tissue disorders, Neurological disorders</td>
<td></td>
</tr>
<tr>
<td>IX</td>
<td></td>
<td>hyaluronidase</td>
<td>AR</td>
<td>Hylanaron</td>
<td>Arthritis</td>
<td></td>
</tr>
</tbody>
</table>

AR: autosomal recessive inheritance, XLR: X-linked recessive inheritance,
DS: dermatan sulfate, HS: heparan sulfate, KS: keratan sulfate, CS: chondroitin sulfate

---

**Introduction**

The mucopolysaccharidoses (MPSs) are a family of genetic metabolic disorders caused by the deficiency of various lysosomal enzymes that are needed to degrade glycosaminoglycans (mucopolysaccharides). The estimated incidence is approximately 1 case per 50,000 to 100,000 population.

**Classification of MPS**

MPS is has been classified from Type I through IX according to the differences in the causative enzymes and symptoms. MPS type I shows autosomal recessive inheritance and is caused by a deficiency of the enzyme α-L-iduronidase; it is broadly categorized into serious Hurler syndrome, moderate Hurler/Scheie syndrome and mild Scheie syndrome. The serious type is characterized by brain disorders, such as developmental disorders, from infancy and regression after childhood. The major symptoms include failure to thrive, generalized joint contractures, facial abnormalities, macroglossia, corneal opacities, deafness, recurrent respiratory tract infection, rough skin, hypertrichosis, mongoloid spots, hepatosplenomegaly, and umbilical hernia. MPS type II (Hunter syndrome) is an X-linked recessive disorder caused by a deficiency of iduronate-2-sulphatase (IDS), and accounts for the majority of Japanese patients with MPS. Although it is clinically similar to type I MPS, corneal opacities are not observed in this type of MPS. It occurs during infancy and childhood, characterized by mental disorders and regression, and is a serious condition in most cases. MPS type III (Sanfilippo syndrome) is classified into four subtypes (A, B, C and D) according to the differences in the causative enzymes. They are characterized by common clinical symptoms, mainly neurological symptoms such as mental retardation and behavioral disorders. The physical symptoms are usually relatively mild. It is the most commonly encountered MPS among the Japanese patients after type II MPS. MPS type IV (Morquio syndrome) is characterized by peculiar bone lesions such as joint hyperextension/fixation, genu valgus (knock-knees), dislocation of the first and second cervical vertebrae, flattening of the vertebral bodies across the entire vertebral column and kyphoscoliosis, but these patients usually have normal intelligence. MPS type VI (Maroteaux-Lamy syndrome), type VII (Sly syndrome) and type IX are extremely rare disease types. Types V and VII are not used to designate any disease types (Table 1).

**Characteristics of MPS**

Various types of mucopolysaccharides accumulated in the tissues and cells (especially, connective tissues) in patients with MPS, and a large amount of these are excreted in the urine. The mucopolysaccharide fraction accumulating is different depending on the disease type (or differences in the deficient enzymes). Accumulation of

---

**Yasuyuki Suzuki** | Professor, Gifu University/Director of Medical Education Development Center (MEDC)
Graduated from Gifu University School of Medicine in 1980. Board-certified pediatrician and representative of the Japan Pediatric Society, Councilor and board-certified clinical geneticist of the Japan Society of Human Genetics, Councilor of the Japanese Society for Inherited Metabolic Diseases. He has been involved in the research and medical care of inherited metabolic diseases, especially mucopolysaccharidoses, adrenoleukodystrophy and peroxisome diseases. He is currently serving as the advisory doctor for the Parents’ Association of Mucopolysaccharidosis and Parents’ Association of Adrenoleukodystrophy. He is currently working on the effects of isoflavones in patients with mucopolysaccharidoses.
dermatan sulfate and heparan sulfate is observed in type I and II MPS, whereas in type III and type IV MPS, the accumulating MPS are heparan sulfate and keratan sulfate, respectively. It is speculated that accumulation of heparan sulfate is closely related to the development of lesions of the central nervous system, and that of keratan sulfate to the development of lesions of the cartilage. However, the accurate fractions of these substances and the pathological conditions associated with their accumulation have not yet been clearly elucidated. In the diagnosis of MPS, the disease type is first estimated based on the type of mucopolysaccharides excreted in the urine and analysis of their fractions, and then a definitive diagnosis is made by measurement of the relevant enzyme activities. Genetic mutation analysis has also been performed and been used for pedigree analysis, carrier and prenatal diagnosis.

**Treatment of MPS**

Bone marrow transplantation (hematopoietic stem cell transplantation) has become established for the treatment of MPS since the 1980s, and has been shown to be effective for some of the MPS disease types. The transplanted stem cells become colonized and multiply in the bone marrow and mesenchymal tissues, and the produced enzymes are taken up not only by the transplanted cells, but also by the lysosomes of cells of various tissues that they reach via the blood flow. Reduction in the accumulation of mucopolysaccharides, improvement of growth, reduction of joint contractures, improvement of the respiratory and digestive symptoms and improvement of neurological maturation have been observed in patients of MPS who have undergone bone marrow transplantation. However, transplantation under the age of two years is desirable, and the effect of transplantation is poor after this age. Furthermore, the effect of transplantation is less pronounced on the bone and central nervous system manifestations than on those of internal organ systems. The effect of bone marrow transplantation also differs according to the disease type: it is known to be relatively more effective for types I and VI.

Bone marrow transplantation is also associated with risks and difficulties. In many cases, it is difficult to obtain suitable donors. Enzyme replacement therapy has been developed in recent years, with the same effect as bone marrow transplantation being expected by administration of the deficient enzymes synthesized by genetic recombination technologies. Currently, enzyme preparations for types I, II and VI have been put to clinical use. However, as is the case with bone marrow transplantation, the effect of enzyme replacement is not so marked on the central nervous system and bone manifestations of MPS.

**MPS and isoflavones**

Since MPS type III is mainly characterized by central nervous system manifestations and is poorly responsive to bone marrow transplantation and enzyme replacement therapy, mainly symptomatic therapy (e.g. control of convulsions, suppression of behavioral abnormalities) has been employed so far. In 2006, a group in Poland reported that genistein, a type of isoflavone, inhibited the synthesis of mucopolysaccharides by about one-fifth in the cells of patients with MPS. The same group also reported that when a supplement of genistein was administered at a dose of 5mg/kg/day to patients with MPS type III, the mental and neurological functions, as well as the morphological defect of the hair improved. Genistein is considered to inhibit the synthetic pathway of mucopolysaccharides by inhibiting the kinase activity of the epidermal growth factor (EGF) receptor. This research triggered trials on the therapeutic effects of genistein in patients with MPS around the world. In an experimental study of a mouse model of MPS type III, administration of genistein at 50–160 mg/kg/day resulted in a reduction of the mucopolysaccharide accumulation in the liver and improvement of the hair abnormalities, although the effect on the central nervous system were not so pronounced.

In Japan, too, the effect of genistein in patients with MPS type III was examined using GCP (culture of basidiomycetes in a soy-extract-containing medium) produced by Amino Up Chemical Co., Ltd.). The patients were administered GCP as genistein at the dose of 5mg/kg/day and the effects on their clinical symptoms and mucopolysaccharide levels in the urine and blood were observed. Enhancement of the comprehension ability, and improvement of the behavioral and hair abnormalities, and of the bowel movements were noted in some patients. On the other hand, the neurological symptoms were aggravated in other patients. Continued and careful observation is therefore necessary in the future.

**Conclusions**

Mucopolysaccharidoses are caused by enzyme deficiencies that result in accumulation in the cellular lysosomes of materials (mucopolysaccharides) that would normally have been degraded by the enzymes. The conventional treatment strategies to enhance the enzyme activity and promote degradation of the accumulated materials have been bone marrow transplantation and enzyme replacement therapy (Fig. 1A). On the contrary, use of genistein is a strategy to decrease the accumulation by inhibiting the synthesis of the substrates (Fig 1B). The development of therapeutic methods based on such a perspective is expected to advance in the future.

**References**


2) Tadao Orii : Diagnosis and treatment of mucopolysaccharidosis, SRL Hakan Quarterly 27 : 117-228, 2003


Dr. Toshinori Ito Presents Sixth Annual UC Davis Kosuna Distinguished Lecture
by Robert Hackman, Ph.D., Research Professor, Department of Nutrition, UC Davis

The Department of Nutrition at the University of California, Davis was privileged to host Mr. Ken-ichi Kosuna and colleagues on 10 May 2010 for the Sixth Annual Kosuna Distinguished Lecture. A number of special events, including a private meeting with UC Davis Chancellor Dr. Linda Katehi, also highlighted the visit.

A common view emerged from the discussion between Mr. Kosuna and Chancellor Katehi—that high quality science and nutrition research can lead to new approaches to health and well-being. After a warm and friendly exchange of gifts (Chancellor Katehi presenting a private-label UC Davis 2002 Cabernet Sauvignon wine from Napa Valley), a pledge was made to explore further areas of cooperation between Amino Up Chemical Co., Ltd. and UC Davis.

The 2010 UC Davis Kosuna Distinguished Lecture was presented by Toshinori Ito, M.D., Ph.D. Professor of Complementary and Alternative Medicine and Director of the Pancreas and Islet Transplant Program, Osaka University Graduate School of Medicine. Entitled “An Integrative Approach to Cancer Patients with Lifestyle Diseases”, the lecture was presented to over 70 faculty, graduate students and research staff members. The Lecture series features an internationally recognized expert in the area of phytochemicals and health presenting their latest research, and is always one of the highlights of the academic year for UC Davis nutrition scientists.

Professor Ito outlined current and future public health challenges in Japan, including the effect of a larger number of aging citizens on the Japanese health care system. The lecture then focused on the current and future incidence of cancer in Japan, and proceeded to describe an innovative program currently studied at Osaka University Graduate School of Medicine to treat patients with an integrative, holistic team approach that blends modern oncology practices with nutrition supplements, acupuncture and other modalities. Following his outstanding lecture, numerous professors and students engaged Dr. Ito in an informative question and discussion session. In the week following the lecture, many faculty and doctoral students commented on the value of learning about the similarities and differences between an American and Japanese approach to cancer, health and medicine.

The Department of Nutrition also awarded two outstanding graduate students with Kosuna Doctoral Fellowships to support their dissertation research. Ms. Roberta Holt and Ms. Sun Jung Yim, both of whom are senior doctoral students studying the role of flavonoids and cardiovascular function, were selected for the Fellowships and received personal congratulations from Mr. Kosuna.

“Our relationship with Amino Up Chemical Co., Ltd. illustrates the advantages of a strong and enduring industry-academic partnership” says Dr. Carl Keen, Professor of Nutrition and Internal Medicine at UC Davis. “By combining the innovative approach to natural products from Amino Up Chemical Co., Ltd. with our world-class basic and clinical research programs, we are able to help advance our understanding of nutrition and help bring new ingredients to the market that are supported by rigorous science.” The Kosuna Distinguished Lecture and Doctoral Fellowships are additional avenues of cooperation, and we at UC Davis look forward to more exciting discussion and research advances in the years to come.
Reports on Academic Meetings and Exhibitions

Ifia/HFE JAPAN 2010

The "Ifia/HFE JAPAN 2010 (Ifia Japan 2010 : The 15th of International Food Ingredients & Additives Exhibition and Conference, HFE JAPAN 2010 : The 8th of Health Food Exposition & Conference) was held at Tokyo Big Sight on May 19-21. A total of 33,712, the largest number ever, people visited the three-day exhibition/conference. Toyo Sugar Refining Co., Ltd. participated in the exhibition as an exhibitor. The company took particular note of bone as a proposed material to help to maintain health and introduced the actions of citrus polyphenol in decreasing the bone density and restoring decreased bone density. Amino Up Chemical Co., Ltd. also introduced various materials, including lychee-derived polyphenol "Oligonol" (anti-fatigue) as an anti-fatigue material and perilla extract as an anti-allergy material.

In the exhibition booth of "Sapporo Bio Cluster "Bio-S", a regional innovation cluster program, global type (phase II), of the innovation systems improvement project by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), in which Amino Up Chemical Co., Ltd. has also been participating with regard to the evaluation of Oligonol, immunological balance-improved food stuffs (kurosengoku) and the functional-food human study model, Human Resources Development Program, were introduced as examples of research results. In addition, "Oligonol-related products" (Amino Up Chemical Co., Ltd.), including "Study report of mali-deprived lactic acid bacteria" (Sapporo Breweries Ltd.), "Introduction of Brown Adipocyte Culture Kit/Cell Tracker Fluorescent Dye, "POLARIC" " (Primary Cell Co., Ltd.), were exhibited and introduced by the participating companies at each booth.

The 59th Annual Meeting of the Japan Society of Acupuncture and Moxibustion, Luncheon Seminar

The 59th Annual Meeting of the Japan Society of Acupuncture and Moxibustion (JSAM) was held at Osaka International Convention Center on June 11-13 under the theme of "Integrated Medicine and Acupuncture: Aiming at further improvement of QOL." Dr. Gary E. Deng of Memorial Sloan-Kettering Cancer Center (MSKCC) delivered a lecture entitled "Clinical Studies of Acupuncture for Cancer" as an invited speaker on June 12, and also a lecture entitled "Research and application of botanical and herbal products" at a luncheon seminar supported by Amino Up Chemical Co., Ltd. on June 13.

In the first lecture, Dr. Gary E. Deng introduced the application of acupuncture for adverse reactions of cancer chemotherapy, clinical examination of the effects of acupuncture for such adverse reactions as nausea, vomiting, pain and hot flushes, and research to unravel the mechanisms of development of such reactions by evaluation of cerebral nerve activities using Functional MRI. In the luncheon seminar, the venue was nearly full to its capacity of 200 persons. Dr. Gary E. Deng explained about the reality of clinical studies of combinations of plant and herb products. He cited the clinical studies that he has conducted at the MSKCC for products with Grifola frondosa as a raw material, curcumin, Shosaikoto, etc., and also introduced AHCC as an immune regulation material. Among the materials already launched in the market as foods, while the safety of some materials has already been established and there is no further need to conduct phase I studies, there are problems with the preparation of an appropriate study protocol and quality control among the product lots. Dr. Gary E. Deng pointed out that the value and importance of these materials as evidence may change depending on the study details.

**Book Review**

Biotechnology in Functional Foods and Nutraceuticals

[Edited by]
Debasis Bagchi • Francis C. Lau • Dilip K. Ghosh

Hard cover/price : 13,547 yen

The review of “AHCC” and “Oligonol” were introduced in an academic book "Biotechnology in Functional Foods and Nutraceuticals" published this April by the publishing company "Taylor & Francis Group" in the UK.

This book was published to provide information on the cutting-edge research on functional foods and nutritional supplements in the food biotechnology industry that has been rapidly growing in recent years to a $1 billion market.
The Latest Publications and Academic Presentations

Presenting the titles of research that have appeared in international journals and academic conferences so far this year.

Publications

  "Beneficial Effect of the Oligomerized Polyphenol Oligonol on High Glucose-induced Changes in eNOS Phosphorylation and Dephosphorylation in Endothelial Cells"
  Hiroki Yokoo, Yuichi Hattori, et al.
  (University of Toyama)

Academic Presentations

- **The 4th Waseda Conference of Human Science (Tokyo, Japan)**
  (Faculty of Human Sciences, Waseda University)
  Jan. 6 (Wed.)–7 (Thu.), 2010
  "The action mechanism of Low Molecular Weight Polyphenol (Oligonol) and its effect on fat metabolism"
  Jun-etsu Ogasawara, et al.
  (The University of Texas, USA)

- **Conference on Nutrition and Cancer–2010 (Ulaanbaatar, Mongolia)**
  Mar. 11 (Thu.)–12 (Fri.), 2010
  "The Role of Nutrition : "Cancer Prevention and Treatment"
  Anil D. Kulkarni
  (The University of Texas, USA)

- **The 83rd Annual Meeting of the Japanese Society of Bacteriology (Kanagawa, Japan)**
  Mar. 27 (Sat.)–29 (Mon.), 2010
  "Therapeutic Effect of Oligonol on Murine Oral Candidiasis"
  Shigeru Abe, et al.
  (Teikyo University)

- **Annual Meeting of Japan Society for Bioscience, Biotechnology, and Agriculture 2010 (Tokyo, Japan)**
  Mar. 27 (Sat.)–30 (Tue.), 2010
  "Inhibitory Effect of Oligonol and Lychee Polyphenol on Obesity"
  Keisuke Murai, et al.
  (Meiji University)

- **Experimental Biology meeting 2010 (Annaheim, USA)**
  Apr. 24 (Sat.)–28 (Wed.), 2010
  "Active Hexose Correlated Compound (AHCC) Improves Immune Cell Populations after Influenza Vaccination of Healthy Subjects."
  Elizabeth M. Gardner, et al.
  (Michigan State University, USA)

- **The 98th Annual Meeting of the Japanese Urological Association (Iwate, Japan)**
  Apr. 27 (Tue.)–30 (Fri.), 2010
  "A Phase III Study of Basidiozyme Extract of Cultures for Prostate Cancer PSA Monitoring Therapy"
  Yoshimitsu Sumiyoshi, et al.
  (Koto Hospital)

- **The 30th Annual Scientific Meeting of the Japanese Society of Mountain Medicine (Gunma, Japan)**
  May 7 (Fri.)–9 (Sun.), 2010
  "Low-pressure and Low-oxygen Induced Oxidant Stress and Antioxidant Effect of Oligonol"
  Jun-ichi Nagasawa, et al.
  (The University of Electro-Communications)

- **The 80th Annual Meeting of the Japanese Society for Hygiene (Miyagi, Japan)**
  May 9 (Sun.)–11 (Tue.), 2010
  "Attenuating Effect of Exercise and Low-Molecular-Weight Polyphenol (Oligonol) on Adipose Tissue Stress"
  Hideki Ono, et al.
  (Kyorin University)

- **The 64th Annual Meeting of Japanese Society of Nutrition and Food Science (Tokushima, Japan)**
  May 21 (Fri.)–23 (Sun.), 2010
  "Anti-Obesity and Diabetes Prevention Effects of Oligonol and Lychee Polyphenol"
  Kyoichi Nagata, et al.
  (Meiji University)

- **The 59th Annual Meeting of the Japan Society of Acupuncture and Moxibustion (Osaka, Japan)**
  Jun. 11 (Fri.)–13 (Sun.), 2010
  "Botanical/herbal Products, Research and Applications"
  Gary E. Deng
  (Memorial Sloan-Kettering Cancer Center, USA)

- **The 6th International Conference on the Biology, Chemistry, and Therapeutic Applications of Nitric Oxide (Kyoto, Japan)**
  Jun. 14 (Mon.)–18 (Fri.), 2010
  "Physiology/Pathophysiology of NO (Gastrointestinal System)"
  Mikio Nishizawa
  (Ritsumeikan University)

- **The 10th Annual Meeting of the Japanese Society on Nutrition Care and Management (Tokyo, Japan)**
  Jun. 19 (Sat.)–20 (Sun.), 2010
  "Effect of Combination of AHCC and Lactic Acid on Cisplatin-induced Adverse Reactions"
  (Amino Up Chemical Co., Ltd.)

  "Effect of Parilla Extract on Anti-allergy"
  Takehito Miura, et al.
  (Amino Up Chemical Co., Ltd.)

Editorial Postscript

Spring appeared to begin a bit late in Hokkaido this year and there were many chilly days even in May. However, hot weather has been continuing since late June. Eco-measures are important, but working during the summer in an office with windows that do not open and without air conditioning is just too hot, even in Hokkaido. I was told that a new company building under construction is scheduled to introduce an air-conditioning system that utilizes natural wind and snow in winter. I look forward to the realization of such an eco-friendly and comfortable office (sweating).

(Takehito Miura)

AHCC Research Association
NEWS LETTER
2010 Winter Vol.7 No.3
English Edition

Data of publication : 2010.9.1
Publication : The Secretariat of the AHCC Research Association
363-32, Shin-ai, Kiyota-ku, Sapporo, 004-0839 Japan
Amino Up Chemical Co., Ltd.
Tel : +81-11-889-2233
Fax : +81-11-889-2375
E-mail : ahcc-res@aminoup.co.jp
All rights reserved.