

Final Program (CRY: Peter L. Steponkus Crystal Award Competitors)

July 19, Sunday

09:00 - 17:00	Board of Governors Meeting	<i>“Maple”, Sapporo Aspen Hotel</i>
13:30 - 16:30	Short Tour #1: Sapporo City Walk & Japanese Tea Ceremony Experience	
15:00 - 18:00	Registration	<i>Foyer (1st FL), CH</i>
18:00 - 20:00	Welcome Reception	<i>“Aspen”, Sapporo Aspen Hotel</i>

July 20, Monday

08:20 - 19:30	Registration	<i>Foyer (1st FL), CH</i>
09:00 - 21:00	Poster Open	<i>Meeting Room #1, CH</i>
10:00 - 19:30	Exhibition Open	<i>Foyer (1st FL), CH</i>
08:50 - 10:20	Plenary Lectures	<i>Large Lecture Hall (2nd FL), CH</i>
08:50-09:00	Welcome Remarks Seizo Fujikawa, Conference Chair	
09:00-09:40	PL-1 Formation of interstellar ice by low temperature surface atomic reactions *A. Kouchi, Y. Oba, N. Miyauchi, H. Hidaka, N. Watanabe <i>Institute of Low Temperature Science, Hokkaido University, Sapporo 060-0819, Japan</i>	
09:40-10:20	PL-2 Ice crystal growth –from space experiment to antifreeze– Yoshinori Furukawa <i>Institute of Low Temperature Science, Hokkaido University, Sapporo 060-0819, Japan</i>	
10:20 - 10:50	Coffee Break	<i>Foyer (1st FL), CH</i>
10:50 - 11:50	Session	<i>Large Lecture Hall (2nd FL), CH</i>

Ice Nucleation, Anti-Ice Nucleation and Anti-Freezing Substances

10:50-11:20	K-1	New technologies developed for practical use of antifreeze protein Yoshiyuki Nishimiya, Ai Miura, Hidemasa Kondo, Yu Hirano, Yasuhiro Mie, Yasuo Komatsu, *Sakae Tsuda <i>National Institute of Advanced Industrial Science and Technology (AIST), Sapporo 062-8517, Japan</i>
11:20-11:35	O-1	Mutational and structural analysis of Ca²⁺-independent type II antifreeze protein from longsnout poacher *Yoshiyuki Nisimiya, Hidemasa Kondo, Manabu Takamichi, Hiroshi Sugimoto, Mamoru Suzuki, Ai Miura, Sakae Tsuda <i>National Institute of Advanced Industrial Science and Technology (AIST), Sapporo 062-8517, Japan</i>
11:35-11:50	O-2	Title Crystal structure of Ca²⁺-depend type II antifreeze protein from Japanese smelt *Hidemasa Kondo, Yoshiyuki Nishimiya, Natsuko Noro, Manabu Takamichi, Masanori Yasui, Ai Miura, Sakae Tsuda <i>National Institute of Advanced Industrial Science and Technology (AIST), Sapporo 062-8517, Japan</i>

10:50 - 11:50 **Session** *Small Lecture Hall (1st FL), CH*

Mammalian Cell and Tissue Cryopreservation

- 10:50-11:20 **K-3** **Ten years of success in vitrification of human oocytes**
Lilia L Kuleshova
National University Medical Institutes, Yong Loo Lin School of Medicine, National University of Singapore, Singapore
- 11:20-11:35 **O-19** **Effects of cryopreservation on histology, stress-strain relationship and viscoelasticity of rabbit common carotid arteries**
Gang Zhao
Department of Modern Mechanics, University of Science and Technology of China, Hefei 230027, Anhui, P.R. China, and Department of Mechanical Engineering, Kyushu University, Fukuoka 819-0395, Japan
- 11:35-11:50 **O-20** **Cryopreservation as factor modifying functional state of Ehrlich adenocarcinoma cancer stem cells**
*A.N. Goltsev, O.V. Safranchuk, M.V. Ostankov, N.A. Bondarovich
Institute for Problems of Cryobiology and Cryomedicine of the National Academy of Sciences of Ukraine, Kharkov, Ukraine

12:00 - 14:00 **Lunch** *Foyer (1st FL), CH*

12:00 - 14:00 **Editorial Board Meeting** *“Elm”, Sapporo Aspen Hotel*

14:00 - 15:30 **Session** *Large Lecture Hall (2nd FL), CH*

Ice Nucleation, Anti-Ice Nucleation and Anti-Freezing Substances (continues)

- 14:00-14:15 **O-3** **Cooperative ice-growth-inhibition of the isoforms of type III antifreeze protein**
*Manabu Takamichi, Yoshiyuki Nishimiya, Ai Miura, Sakae Tsuda
National Institute of Advanced Industrial Science and Technology (AIST), Sapporo 062-8517, Japan
- 14:15-14:30 **O-4** **Antifreeze proteins mechanism**
*Salvador Zepeda, Yukihiro Uda, Etsuro Yokoyama, Yoshinori Furukawa
Institute of Low Temperature Science, Hokkaido University, Sapporo 060-0819, Japan
- 14:30-14:45 **O-5** **A new look at the concentration dependence of ice-binding proteins**
Yeliz Celik, Natalya Pertaya, Junjie Liu, Yangzhong Qin, Di Xu, Peter L. Davies, *Ido Braslavsky
Department of Physics and Astronomy, Ohio University, Athens, 45701, OH, USA
- 14:45-15:00 **O-6** **Recrystallization of ice crystals in sucrose solution in the presence of AFP type I**
*Tomoaki Hagiwara, Kazuma Tokizawa, Takaharu Sakiyama
Department of Food Science and Technology, Tokyo University of Marine Science and Technology, Tokyo 108-8477, Japan
- 15:00-15:15 **O-7** **Enhancement of the activity of antifreeze protein by addition of a CRY**
water soluble polymer
*Kazuhisa Iwasaki, Manabu Takamichi, Yoshiyuki Nishimiya, Ai Miura, Hidemasa Kondo, Sakae Tsuda
National Institute of Advanced Industrial Science and Technology (AIST), Sapporo 062-8517, Japan and Division of Biological Sciences, Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan
- 15:15-15:30 **O-8** **An experimental study of ice growth in the presence of ice**

nucleation-active bacteria

*Hiroki Nada, Salvador Zepeda, Yoshinori Furukawa

*National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba 305-8569, Japan*14:00 - 15:30 **Session** *Small Lecture Hall (1st FL), CH***Mammalian Cell and Tissue Cryopreservation (continues)**

- 14:00-14:15 **O-20 CRY** **Evaluation of viability of cryopreserved rat cardiac myocytes and effects of dimethyl sulfoxide concentration on cryopreservation**
*Kenichiro Miyamura Masafumi Nagayama Kazutoshi Gohara, Toshio Taira, Kyoko Shimizu, Masato Sakai, Tsutomu Uchida
Div. App. Phys., Grad. Sch. Eng., Hokkaido Univ. Sapporo 060-8628, Japan
- 14:15-14:30 **O-21 CRY** **Improved cryopreservation protocols for brain cell aggregates**
*Rita Malpique, Friederike Ehrhart, Luísa Osório, Daniela Ferreira, Heiko Zimmermann, Paula M. Alves
IBET/ITQB, Apartado 12, 27801-901 Oeiras, Portugal
- 14:30-14:45 **O-22 CRY** **Spindle configuration and in-vitro embryo development of ovine oocytes vitrified at germinal vesicle stage: Effect of caffeine treatment on subsequent development**
*Adel R. Moawad, Inchul Choi, Jie Zhu, Dassari Amarnath, Keith H.S. Campbell
Division of Animal sciences, School of Biosciences, The University of Nottingham, Loughborough, Leicestershire, LE12 5RD, UK
- 14:45-15:00 **O-23** **Direct cryopreservation of primary hepatocytes and ES cells using a collagen vitrigel membrane**
*Yoshitaka Miyamoto, Shin Enosawa, Tomoyo Takeuchi, Toshiaki Takezawa
National Research Institute for Child Health and Development, Tokyo 157-8535, Japan, and Transgenic Animal Research Center, National Institute of Agrobiological Sciences, Ibaraki, Japan
- 15:00-15:15 **O-24** **Cryopreservation of human adipose tissue-derived stem/progenitor cells using the silk protein sericin**
*Yoshitaka Miyamoto, Koichi Oishi, Hiroshi Yukawa, Hirofumi Noguchi, Masahiro Sasaki, Hisashi Iwata, Shuji Hayashi
Nagoya University Graduate School of Medicine, Nagoya 466-8550, Japan
- 15:15-15:30 **O-25** **The King is dead, long live the King! Cryopreservation of post-mortem sperm as a valuable source in restoration of endangered species (Moscow Zoo Experience)**
George Yu. Maksudov, Natalia V. Shishova, *Igor I. Katkov
CELLTRONIX, San Diego, California, USA

15:30 - 16:00 **Coffee Break** *Foyer (1st FL), CH*16:00 - 18:45 **Session** *Large Lecture Hall (2nd FL), CH***Ice Nucleation, Anti-Ice Nucleation and Anti-Freezing Substances (continues)**

- 16:00-16:15 **O-9** **Characterization of anti-nucleating activity and supercooling stabilizing activity involved in deep supercooling of *Trachycarpus* leaves**
Masaya Ishikawa
Environmental Stress Research Unit, National Institute of Agrobiological Sciences, Tsukuba, Ibaraki 305-8602, Japan

- 16:15-16:30 **O-10** **Difference in supercooling-facilitating (anti-ice nucleation) activity among diverse kinds of flavonoid glycosides**
 *Jun Kasuga, Atsushi Nishioka, Chikako Kuwabara, Donghui Wang, Yuhto Suzuki, Emiko Fujikawa, Keita Arakawa, Yukiharu Fukushi, Seizo Fujikawa
Research Faculty and Graduate School of Agriculture, Hokkaido University, Sapporo 060-8589, Japan

Osmotic Stress, Desiccation and Freeze-Drying
--

- 16:30-17:00 **K-2** **Life without water: anhydrobiosis in the Sleeping Chironomid, *Polypedilum vanderplanki***
 *Takashi Okuda, Takahiro Kikawada, Minoru Sakurai, Takao Furuki, Ken-ichi Akao, Yuichi Nakahara, Gusev Oleg, Ayako Saito, Masahiko Watanabe, Ken-ichi Iwata, Yasushi Kanamori, Richard Cornette
Anhydrobiosis Research Unit, National Institute of Agrobiological Sciences, Tsukuba 305-8634, Japan
- 17:00-17:15 **O-11** **Membrane phase behavior of *Escherichia coli* during desiccation, re-hydration, and growth recovery**
 Cally Scherber, Janet L. Schottel, *Alptekin Aksan
Department of Mechanical Engineering, University of Minnesota Minneapolis, MN 55455, USA
- 17:15-17:30 **O-12** **Structural analysis for dehydrated LEA proteins of *Polypedilum vanderplanki* by replica exchange molecular dynamics simulation**
 Shohei Miyama, Tempei Shimizu, Takao Furuki, Yuichi Harano, Yasushi Kanamori, Takahiro Kikawada, Takashi Okuda, *Minoru Sakurai
Center for Biological Resources and Informatics, Tokyo Institute of Technology, Yokohama 226-8501, Japan
- 17:30-17:45 **O-13** **Characterization of the red blood cell resistance to oxidative injury during desiccation stress**
CRY
 *Tamir Kaniyas, Jason P. Acker
Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, Alberta, Canada, and Research and Development, Canadian Blood Services, Edmonton, Alberta, Canada
- 17:45-18:00 **O-14** **Effects of additives on the stabilization of freeze-dried enzyme mixtures: alkaline phosphatase, nucleoside phosphorylase and xanthine oxidase**
CRY
 *Paveena Srirangsan, Kiyoshi Kawai, Naoko Hamada-Sato, Rikuo Takai, Toru Suzuki
Department of Food Science and Technology, Tokyo University of Marine Science and Technology, Tokyo 108-8477, Japan
- 18:00-18:15 **O-15** **Effect of sugar on the osmotic injury of PC-3 cells in hypertonic NaCl solutions**
 Takuro Yoshimura, *Hiroshi Takamatsu
Department of Mechanical Engineering, Kyushu University, Fukuoka, Japan
- 18:15-18:30 **O-16** **Effects of pre-cooling rates on the freeze-dried pig artery and the analysis about its movement of sublimation interface**
CRY
 *Meng-fang Liu, Le-ren Tao, Jian-qing Wu, Shu-hong Zhang, Yong-fu Li
Institute of Cryogenic Technology and Food Freezing, University of Shanghai for Science and Technology, Shanghai, 200093, P.R. China
- 18:30-18:45 **O-17** **Glass transition and chemical stability of model freeze-dried foods**
 *Kiyoshi Kawai, Paveena Srirangsan, Kaori Tsuji, Toru Suzuki
Department of Biofunctional Science and Technology, Graduate School of Biosphere Science, Hiroshima University, Hiroshima 739-8528, Japan

Mammalian Cell and Tissue Cryopreservation (continues)

- 16:00-16:15 **O-26** **Highly efficient vitrification for clinical cryopreservation of human oocytes**
 *M. Kuwayama, O. Kato
Kato Ladies' Clinic, Tokyo, Japan
- 16:15-16:30 **O-27** **Equilibrium vitrification of mouse embryos**
CRY *Bo Jin, Eri Hotta, Yukiko Kobayashi, Kaori Ito, Go Egawa, Shinsuke Seki, Hiroshi Honda, Keiji Mochida, Atsuo Ogura, Keisuke Edashige, Magosaburo Kasai
Laboratory of Animal Science, College of Agriculture, Kochi University, Nankoku, Kochi 783-8502, Japan
- 16:30-16:45 **O-28** **The effects of different factors associated with vitrification procedures on human oocyte viability: a meta-analysis**
 Steven F. Mullen
21st Century Medicine, Inc., Fontana, CA 92336, USA
- 16:45-17:00 **O-29** **Survival of oocytes in antral follicles of vitrified mouse ovaries**
 Keisuke Edashige, *Delgado M. Valdez Jr., Hiroshi Honda, Yu Nishikado, Bo Jin, Magosaburo Kasai
Laboratory of Animal Science, College of Agriculture, Kochi University, Nankoku, Kochi 783-8502, Japan

Principles of Cryopreservation-1

- 17:00-17:30 **K-4** **Computational predictions of the cryopreservation of human oocytes**
 *J.J. McGrath, S.A. Unhale
Aerospace & Mechanical Engineering, University of Arizona, Tucson, Arizona 85721, USA
- 17:30-17:45 **O-30** **A digital microfluidic platform for high throughput optimization of cryoprotective agents**
 *Bumsoo Han, Hyejin Moon
Department of Mechanical and Aerospace Engineering, University of Texas at Arlington, Arlington, TX 76019, USA
- 17:45-18:00 **O-31** **Simple, inexpensive measurement of very rapid cooling and warming rates**
 *F.W. Kleinhans, Shinsuke Seki, Peter Mazur
Dept. of Physics, IUPUI, Indianapolis, Indiana 46202, USA, and Dept. of Biochemistry & Cellular & Molecular Biology, The University of Tennessee, Knoxville, Tennessee 37932, USA
- 18:00-18:15 **O-32** **Levitating vitrified droplets**
 *Young S. Song, Douglas Adler, Hasan O. Keles, Emre Kayaalp, Aida Nureddin, Raymond M. Anchan, Richard Maas, Utkan Demirci
Center for Bioengineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA
- 18:15-18:30 **O-33** **Numerical study on the temperature dependence of the loading duration for cryoprotectant and toxic injury**
 Zhang Shaozhi, Xu Mengjie and Chen Guangming
Cryobiology Laboratory, Refrigeration & Cryogenic Engineering Institute, Zhejiang University, P.R. China
- 18:30-18:45 **O-34** **Optimal control an cryoprotective agent addition and removal protocols**
 *James D. Benson, Carmen C. Chicone, John K. Critser
Department of Mathematics and Department of Veterinary Pathobiology,

University of Missouri, Columbia, Missouri 65202, USA

- 18:45-19:00 **O-35** **Determination of cryoprotectant permeability properties in monolayers of bovine endothelial cells using an *in situ* fluorescence quenching technique**
A.K. Fry, *A.Z. Higgins
School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis, OR 97331-2702, USA

- 19:00 - 21:00 **Poster Session #1** *Meeting Room #1, CH*
- 19:00-19:45 **Odd-Numbered Poster Presentation**
- 19:45-20:30 **Even-Numbered Poster Presentation**

July 21, Tuesday

- 08:20 - 19:30 **Registration** *Foyer (1st FL), CH*
- 09:00 - 21:00 **Poster Open** *Meeting Room #1, CH*
- 09:00 - 19:30 **Exhibition Open** *Foyer (1st FL), CH*
- 09:00 - 09:40 **Plenary Lecture** *Large Lecture Hall (2nd FL), CH*
- 09:00-09:40 **PL-3** **Plant germplasm cryopreservation: progress and prospects**
Florent Engelmann
Institut de recherche pour le développement (IRD), UMR DIAPC, 911 avenue Agropolis, BP 64501, 34394 Montpellier cedex 5, France
- 09:40 - 10:10 **Coffee Break** *Foyer (1st FL), CH*
- 10:10 - 11:55 **Session** *Large Lecture Hall (2nd FL), CH*

Low Temperature Medicine

- 10:10-10:40 **K-5** **Trend in clinical application of cryopreserved heart-valve and vascular allografts -- 11-year experience of the University of Tokyo Tissue Bank**
*Aya Saito, Noboru Motomura, Sumihito Tamura, Minoru Ono, Osamu Kinoshita, Ayako Ohtsubo, Ehson Karimov, Hiromi Ikai, Shinichi Takamoto, Norihiro Kokudo
Department of Cardiothoracic Surgery, The University of Tokyo, Tokyo, Japan
- 10:40-10:55 **O-36** **Percutaneous lung cryotherapy by computer tomography guidance**
Wang Hongwu
Minimal Invasive Tumor Therapy Center, Meitan General Hospital, Beijing, P.R.China
- 10:55-11:10 **O-37** **Immunomodulatory effects of cryolytic lung cancer cells on bone marrow-derived dendritic cells**
Wang Hongwu
Minimal Invasive Tumor Therapy Center, Meitan General Hospital, Beijing, P.R.China
- 11:10-11:25 **O-38** **Tumor size and endophytic growth pattern affect recurrence after laparoscopic renal cryoablation**
Matvey Tsivian, Christopher J. Lyne, Janice M. Mayes, Vladimir Mouraviev, Masaki Kimura, *Thomas J Polascik

Duke University Medical Center, Durham, NC, USA

11:25-11:40 **O-39 Laparoscopic and percutaneous cryoablation for renal tumors: a two-institutional experience**

*Thomas J. Polascik, Matvey Tsivian, Janice M. Mayes, Vladimir Mouraviev, Blake Wynia, Bruce Shingleton

Duke University Medical Center, Durham, NC, USA

11:40-11:55 **O-40 Cryosurgery for metastatic lung tumor derived from colorectal cancer; outcome and prospective future**

Yoshikane Yamauchi, Masafumi Kawamura, Seishi Nakatsuka, Yotaro Izumi, Hideki Yashiro, Norihisa Tsukada, Masanori Inoue, Keisuke Asakura, Hiroaki Nomori, Sachio Kuribayashi

Division of General Thoracic Surgery¹, School of Medicine, Keio University, Tokyo, Japan

10:10 - 11:40 **Session** *Small Lecture Hall (1st FL), CH*

Plant Cryopreservation in Honor of Dr. Akira Sakai

10:10-10:40 **K-7 Antioxidants improve regrowth of cryopreserved *in vitro* shoot tips**
Esther E. Uchendu, Magfrat Muminova, Maret G. Traber, *Barbara M. Reed

USDA-ARS NCGR, Corvallis, OR 97333-2521, USA

10:40-10:55 **O-50 Pollen cryo-bank establishment and application of traditional Chinese flowers**

B.L. Li, Y.L. Zhang, H. Wang, CH. Song, *Y. Liu

College of Landscape Architecture, Beijing Forestry University and National Floriculture Engineering & Technology Research Center, Beijing, 100083, P.R. China

10:55-11:10 **O-51 Development of alternative plant vitrification solutions and loading solutions in droplet-vitrification procedures**

*Haeng-Hoon Kim, Na-Young No, Dong-Jin Shin, Hyung-Jin Baek, Jung-Hoon Kang, Jung-Gon Kim, Eun-Gi Cho

National Academy of Agricultural Science, RDA, Suwon 441-707, Korea

11:10-11:25 **O-52 Cryopreservation of *Cymbidium hybridum* Walu'Idol' protocorms by vitrification**

*B.L. Li, P.P. Liu, Y. Liu

College of Landscape Architecture, Beijing Forestry University and National Floriculture Engineering & Technology Research Center, Beijing, 100083, P.R. China

11:25-11:40 **O-53 Cryopreservation of chrysanthemum (*Dendrathera grandiflora*) axillary buds by droplet-vitrification procedure**

Yoon-Geol Lee, Na-Young Noh, Elena Popova, *Haeng-Hoon Kim, Gyu-Taek Cho, Hyung-Jin Baek

National Academy of Agricultural Science, RDA, Suwon 441-707, Korea

12:00 - 14:00 **Lunch** *Foyer (1st FL), CH*

12:10 - 14:00 **ICYR Mentors Lunch** *Small Lecture Hall (1st FL), CH*

13:00 - 15:00 **Short Tour #2: Institute of Low Temperature Science Tour**

15:00 - 15:40 **Plenary Lecture** *Large Lecture Hall (2nd FL), CH*

15:00-15:40 **PL-4 A conserved RNA chaperone function of cold shock domain proteins**

*Ryozo Imai, Myung-Hee Kim, Kentaro Sasaki, Yutaka Sonoda, Mariana Radkova

15:40 - 16:40 **Session** *Large Lecture Hall (2nd FL), CH*

Low Temperature Medicine (continues)

- 15:40-16:10 **K-6** **Nano-cryosurgery: basic features and challenges**
*Jing Liu, Zhong-Shan Deng
Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, P.R. China, and Department of Biomedical Engineering, School of Medicine, Tsinghua University, Beijing 100084, P.R. China
- 16:10-16:25 **O-41** **The improvement of preserving hepatocytes in cryoprotectants and supercooling method for the treatment of human hepatocyte transplantation in liver diseases**
*Fumiaki Nakazawa, Stephen C. Strom, Toru Tamaki, Akio Kawamura, Seizo Fujikawa
Shinkotoni Family Clinic, Sapporo, Japan, Department of Pathology, University of Pittsburgh, Pittsburgh, PA, USA, and The Research Center of Artificial Organ and Transplantation, Sapporo Hokuyu Hospital, Sapporo, Japan
- 16:25-16:40 **O-42** **Successful ultra-rapid cooling vitrification of human and cattle ovarian tissues for auto- and xenotransplantation**
*N. Kagawa, M. Kuwayama, C. Mori, S.J. Silber, O. Kato
Kato Ladies' Clinic, Tokyo, Japan

15:40 - 16:40 **Session** *Small Lecture Hall (1st FL), CH*

Plant Cold Adaptation

- 15:40-16:10 **K-8** **Plant freezing tolerance and calcium-dependent membrane resealing under freezing**
Yukio Kawamura, Tomokazu Yamazaki, Matsuo Uemura
Cryobiofrontier Research Center, Iwate University, Morioka 020-8550, Japan
- 16:10-16:25 **O-54** **Low temperature may regulate the expression of rice mitochondria-encoded genes via post-transcriptional events**
*Shiho Kurihara-Yonemoto, Tomohiko Kubo
Crop Cold Tolerance Research Team, National Agricultural Research Center for Hokkaido Region, Sapporo 062-8555, Japan
- 16:25-16:40 **O-55** **Natural variation of low temperature tolerance at germination stage in rice**
*Natsuko Iwata, Kenji Fujino
HOKUREN Federation of Agricultural Cooperatives, Naganuma, Hokkaido 069-1317, Japan

16:40 - 17:10 **Coffee Break** *Foyer (1st FL), CH*

17:10 - 18:55 **Session** *Large Lecture Hall (2nd FL), CH*

Low Temperature Medicine (continues)

- 17:10-17:25 **O-43** **Nanoparticle enhanced hybrid cryosurgery and RF hyperthermia**
*Zhong-Shan Deng, Jing Liu
Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, P.R. China
- 17:25-17:40 **O-44** **Cryosurgical probe using non-flammable mixed refrigerants**

- *Gyuwan Hwang, Sangkwon Jeong
Department of Mechanical Engineering, KAIST, Daejeon, 305-701, Republic of Korea
- 17:40-17:55 **O-45** **Cryoablation for the patients with second primary lung cancer after pulmonary resection**
Hiroaki Kuroda, Masafumi Kawamura, Yoshikane Yamauchi, Masafumi Kawamura, Seishi Nakatsuka, Yotaro Izumi, Hideki Yashiro, Norimasa Tsukada, Masanori Inoue, Keisuke Asakura, Hiroaki Nomori, Sachio Kuribayashi
Division of General Thoracic Surgery, School of Medicine, Keio University, Tokyo, Japan
- 17:55-18:10 **O-46** **Combinatorial cryosurgery: the cellular and molecular mechanisms and dynamics of injury and wound healing in TNF-alpha enhanced freeze destruction of prostate cancer**
CRY
*Jing Jiang, Raghav Goel, Steve Schmechel, John Bischof
Department of Biomedical Engineering, University of Minnesota, Minneapolis, Minnesota 55455, USA
- 18:10-18:25 **O-47** **A novel packaging system for cryopreservation of cell therapy products**
Erik J. Woods
General BioTechnology LLC, Indianapolis, IN 46202, USA, and Department of Microbiology and Immunology, Indiana University School of Medicine, Indianapolis, IN 46202, USA
- 18:25-18:40 **O-48** **Freezing and thawing kinetics during cryoablation of the lung**
Norimasa Tsukada, Yoshikane Yamauchi, Keisuke Asakura, Yotaro Izumi, Masafumi Kawamura, Hiroaki Nomori, Masanori Inoue, Hideki Yashiro, Seishi Nakatsuka, Sachio Kuribayashi, Yasuhiro Nagasawa, Kansei Iwata
General Thoracic Surgery of Kawasaki Hospital, Kawasaki, Japan
- 18:40-18:55 **O-49** **Anti-infectious properties of cryopreserved vascular allografts after transplantation: the role of indoleamine 2,3-dioxygenase mediated tryptophan catabolism**
*Ehson Karimov, Noboru Motomura, Aya Saito, Kazuhiro Kakimi, Minoru Ono, Hidemasa Nakaminami, Misa Tajima, Norihisa Noguchi, Masanori Sasatsu, Shinichi Takamoto
Cardiothoracic Surgery Department, Graduate School of Medicine of the University of Tokyo, Tokyo 113-8655, Japan

17:10 - 18:55 **Session** *Small Lecture Hall (1st FL), CH*

Plant Cold Adaptation (continues)

- 17:10-17:25 **O-56** **Dynamine-related protein 1E, a plant plasma membrane microdomain protein, is associated with freezing tolerance of *Arabidopsis***
Anzu Minami, *Matsuo Uemura
Cryobiofrontier Research Center, Iwate University, Morioka 020-8550, Japan
- 17:25-17:40 **O-57** **Global expression profiling of genes targeted by *qLTG3-1* controlling low temperature tolerance at germination stage in rice**
*Kenji Fujino, Yasuyuki Matsuda
HOKUREN, Hokkaido, Japan
- 17:40-17:55 **O-58** **Study on winter-induced proteins involved in freezing resistance of xylem tissue of larch**
Kazunari Morimoto, Hitoshi Mori, Jun Kasuga, Seizo Fujikawa, *Keita Arakawa
Research Faculty of Agriculture, Hokkaido University, Sapporo

Bacterial Cold Adaptation

17:55-18:25	K-9	Mycelial growth of snow molds under frozen condition *Tamotsu Hoshino, Naoyuki Matsumoto, Fumio Terami, Oleg B. Tkachenko, Motoaki Tojo <i>National Institute of Advanced Industrial Science and Technology, Sapporo 062-8517, Japan</i>
18:25-18:40	O-59	A 10,000-year-old clone of the snow mold fungus, <i>Typhula ishikariensis</i> biotype A *Naoyuki Matsumoto, Tamotsu Hoshino, Oleg B. Tkachenko, Akira Kawakami, Mineko Fujiwara <i>National Agricultural Research Center for Hokkaido Region, Sapporo 062-8555, Japan</i>
18:40-18:55	O-60	<i>Arabidopsis thaliana</i> as a model for studying plant-snow mold interactions under snow *Chikako Kuwabara, Ai Uehara, Petya K. Christova, Nikolai K. Christov, Kentaro Sasaki, Tamotsu Hoshino, Ryozi Imai <i>Crop Cold Tolerance Research Team, National Agricultural Research Center for Hokkaido Region, National Agriculture and Food Research Organization (NARO), Sapporo, 062-8555, Japan, and Research Faculty and Graduate School of Agriculture, Hokkaido University, Sapporo 060-8589, Japan</i>
19:00 - 21:00	Poster Session #2	Meeting Room #1, CH
19:00-19:45	Even-Numbered Poster Presentation	
19:45-20:30	Odd-Numbered Poster Presentation	

July 22, Wednesday

08:20 - 14:00	Registration	Foyer (1st FL), CH
09:00 - 14:00	Poster Open	Meeting Room #1, CH
09:00 - 12:00	Exhibition Open	Foyer (1st FL), CH
09:00 - 10:15	Session	Large Lecture Hall (2nd FL), CH

Cell and Tissue Freezing

09:00-09:30	K-10	Assessment of intracellular ice formation characteristics of hollow microcapsules using TEC cryomicroscope *T.T. Lin, T.L. Wu, S.C. Chou, C.Y. Yang, M.J. Chen <i>Department of Bio-Industrial Mechatronics Engineering, National Taiwan University, Taipei 106, Taiwan, ROC</i>
09:30-09:45	O-61 CRY	Innocuous intracellular freezing in human dental stem cells Mariia Zhurova, Jason P. Acker, Erik J. Woods <i>Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, AB T6G 2R8, Canada, and Research and Development, Canadian Blood Services, Edmonton, AB T6G 2R8, Canada</i>
09:45-10:00	O-62 CRY	Tolerable supercooling before intracellular ice formation for cells in suspension

*Richelle C. Prickett, Janet A.W. Elliott, Locksley E. McGann
*Departments of Chemical and Materials Engineering and Laboratory
 Medicine and Pathology, University of Alberta, Edmonton, Alberta,
 Canada*

10:00-10:15 **O-63** **Intracellular ice formation and macromolecular redistribution during cellular cryopreservation: a confocal Raman microscopy study**

Jinping Dong, John C. Bischof, Allison Hubel, *Alptekin Aksan
*Mechanical Engineering Department and Center for Biotransport,
 Institute for Engineering in Medicine, University of Minnesota,
 Minneapolis, MN 55455, USA*

09:00 - 09:45 **Session** *Small Lecture Hall (1st FL), CH*

Amphibian, Insect and Mollusk Cold Adaptation

09:00-09:15 **O-69** **Siberian wood frog in Yakutia: habitats, nutrition, reproduction, parasites fauna, ecological and physiological peculiarities**

T.N. Solomonova, V.T. Sedalishchev, V.A. Odnokurtsev, S.G. Protopopov
*Institute for Biological Problems of Cryolithozone, Siberian Branch,
 RAS, Yakutsk, 677980, Russia*

09:15-09:30 **O-70** **Seasonal changes of phospholipids in last instar larvae of the rice stem borer, *Chilo suppressalis* Walker (Lepidoptera: Pyralidae)**

*Yohei Izumi, Chihiro Katagiri, Shoji Sonoda, Hisaaki Tsumuki
*Research Institute for Bioresources, Okayama University, Kurashiki
 710-0046, Japan*

09:30-09:45 **O-71** **Development of cold hardiness in the freshwater apple snail, *Pomacea canaliculata*: lethal factors at low temperature and physiological aspects**

*Keiichiro Matsukura, Hisaaki Tsumuki, Yohei Izumi, Takashi Wada
*Research Team for Insect and Nematode Management, National
 Agricultural Research Center for Kyushu Okinawa Region, Kumamoto
 861-1192, Japan*

10:15 - 10:45 **Coffee Break** *Foyer (1st FL), CH*

10:45 - 12:00 **Session** *Large Lecture Hall (2nd FL), CH*

Cell and Tissue Freezing (continues)

10:45-11:00 **O-64** **Interplay between the actin cytoskeleton and the cell membrane during freeze-thaw and osmotic de/re-hydration**

Vishard Ragoonanan, Alptekin Aksan
*Biostabilization Laboratory, Department of Mechanical Engineering,
 University of Minnesota, Minneapolis, MN, USA*

11:00-11:15 **O-65** **Observation of survival distribution in monolayer cells after cryopreservation: influence of cell density on post-thaw viability**

*Akira Iwama, Ken-ichiro Shibuya, Aya Matsui, Masanobu Ujihira
*Graduate School of Medical Sciences, Kitasato University, Sagamihara,
 Kanagawa 228-8555, Japan*

11:15-11:30 **O-66** **Viable cells can be derived from frozen fat without cryoprotection**

*Yoichiro Hoshino, Kazuhiro Saeki
Gifu Prefectural Livestock Research Institute, Takayama, Gifu, Japan

11:30-11:45 **O-67** **The salting-in hypothesis of post-hypertonic lysis explains liposome cryoprotective action**

*J.L.Holovati, J.P.Acker, K.Muldrew
*Department of Laboratory Medicine and Pathology, University of
 Alberta, Edmonton, AB, T6G 2B7, Canada, and Canadian Blood*

11:45-12:00	O-68	<p><i>Services, Research and Development, Edmonton, AB, T6G 2R8, Canada</i></p> <p>Effect of the freezing and storage in long-term liquid nitrogen-vapor on the motility, viability, morphology, DNA integrity and mitochondrial potential of frozen-thawed human spermatozoa</p> <p>J.J. Lim, T.E. Shin, S.Y. Sung, E.S. Kim, Y.S. Her, D.R. Lee, S.H. Song, C.W. Bak, W.S. Lee, T.K. Yoon</p> <p><i>Fertility Center, CHA Gangnam Medical Center, CHA University, Seoul, 135-081, Korea</i></p>
10:45 - 11:45	Session	<i>Small Lecture Hall (1st FL), CH</i>
Natural Cold for Agricultural Application		
10:45-11:00	O-72	<p>Preliminary results of long duration storage of plants seeds in cryodepository in the layer of eternal frigidity in Yakutia</p> <p>N.G. Solomonov, B.I. Ivanov, B.M. Kerschengoltz, P.A. Remigaylo</p> <p><i>Institute for Biological Problems of Cryolithozone Siberian Branch of Russian Academy of Sciences (IBPC SB RAS), Yakutsk, 677980, Russia</i></p>
11:00-11:15	O-73	<p>Utilization of below-freezing-point fresh air in winter for preserving high-quality rice</p> <p>*Shuso Kawamura, Kazuhiro Takekura</p> <p><i>Graduate School of Agricultural Science, Hokkaido University, Sapporo, Hokkaido 060-8589, Japan</i></p>
Ecology in Cold Regions		
11:15-11:30	O-74	<p>Rare and endangered species of birds of eastern Yakutia taiga and tundra regions</p> <p>Nikita G. Solomonov, Nikolay I. Germogenov, Arkadiy P. Isayev, Nikolay A. Nakhodkin, Viktor G. Degtyaryov, Nikolay N. Egorov, Sergey M. Sleptsov, Vasilij V. Okoneshnikov, Mariya V. Vladimirtseva, Inga P. Bysykatova</p> <p><i>Institute for Biological Problems of Cryolithozone Siberian Branch of Russian Academy of Sciences (IBPC SB RAS), Yakutsk, 677980, Russia</i></p>
11:30-11:45	O-75	<p>Hibernation and dormancy in mammals as a means of adapting to survival under extreme winter conditions of continental Siberia</p> <p>N.G. Solomonov, A.I. Anufriev, V.N. Vasiliev, T.N. Solomonova, A.K. Akhremenko, O.N. Kolosova, B.M. Kerschengolts</p> <p><i>Institute for Biological Problems of Cryolithozone Siberian Branch of Russian Academy of Sciences (IBPC SB RAS), Yakutsk, 677980, Russia</i></p>
12:00 - 14:00	Lunch	<i>Foyer (1st FL), CH</i>
12:00 - 14:00	Business Meeting	<i>Large Lecture Hall (2nd FL), CH</i>
14:30 - 20:00	Excursion/Dinner	

July 23, Thursday

08:20 - 17:00	Registration	<i>Foyer (1st FL), CH</i>
09:00 - 12:00	Poster Open	<i>Meeting Room #1, CH</i>
09:00 - 12:00	Exhibition Open	<i>Foyer (1st FL), CH</i>

09:00 - 09:40 **Plenary Lecture** *Large Lecture Hall (2nd FL), CH*

09:00-09:40 **PL-5 "What can we learn from cryopreserved blood cells?"**
Andreas Sputtek
*Univ.-Klinikum Hamburg-Eppendorf, Institut f. Transfusionsmedizin,
20246 Hamburg, Germany*

09:40 - 10:10 **Coffee Break** *Foyer (1st FL), CH*

10:10 - 11:25 **Session** *Large Lecture Hall (2nd FL), CH*

Principles of Cryopreservation-2

- 10:10-10:25 **O-76 Linear irreversible thermodynamic model for multiple permeable cryoprotectant solutes: a tool for modeling vitrification solutions**
CRY *S.A. Unhale, V. Veerasamy, J.J. McGrath
Aerospace and Mechanical Engineering, University of Arizona, Tucson, AZ 85721, USA
- 10:25-10:40 **O-77 Modeling transport phenomena in cartilage**
CRY *Alireza Abazari, Janet AW Elliott, Locksley E McGann
Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada
- 10:40-10:55 **O-78 Thermodynamic solution properties of the cytoplasm of living nucleated cells**
CRY *Lisa U. Ross-Rodriguez, Janet A. W. Elliott, Locksley E. McGann
Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, Alberta, Canada
- 10:55-11:10 **O-79 Rapid movement of water and cryoprotectants in pig expanded blastocysts via channel processes -its relevance to their tolerance to cryopreservation-**
CRY *Keisuke Edashige, Bo Jin, Ryu-ichi Higashiyama, Jun-ichi Yonezawa, Masashi Miyake, Sei-ichi Takahashi, Ken-ichi Yazawa, Magosaburo Kasai
Laboratory of Animal Science, College of Agriculture, Kochi University, Nankoku, Kochi 783-8502, Japan
- 11:10-11:25 **O-80 Freezing-induced swelling and shrinkage of engineered tissues during cryopreservation**
CRY Ka Yaw Teo, J. Craig Dutton, *Bumsoo Han
Department of Mechanical and Aerospace Engineering, University of Texas at Arlington, Arlington, TX 76019, USA

10:10 - 11:40 **Session** *Small Lecture Hall (1st FL), CH*

Biophysics of Water, Solution and Molecules

- 10:10-10:40 **K-11 Effects of trehalose on ATP degradative activity of F1-/F0F1-ATPase membrane protein**
CRY Ryo Shirakashi, Qiaoqiao Shen
I.I.S., The University of Tokyo, Tokyo, Japan
- 10:40-10:55 **O-89 Presence of confined water clusters in supercooled carbohydrate solutions**
CRY Jason Malsam, *Alptekin Aksan
Biostabilization Laboratory, Department of Mechanical Engineering, University of Minnesota Minneapolis, MN 55455, USA
- 10:55-11:10 **O-90 Structural changes of encapsulated proteins in nanoporous matrices at cryogenic and high temperatures**
CRY Eduardo Reátegui, *Alptekin Aksan

		<i>Biostabilization Laboratory, Department of Mechanical Engineering, University of Minnesota Minneapolis, MN 55455, USA</i>
11:10-11:25	O-91	Micro-Brillouin scattering study of elastic properties in polymorphic protein crystals *Yuichiro Aoki, Hitoshi Kanazawa, Takahiro Ishii, Seiji Kojima <i>Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8573, Japan</i>
11:25-11:40	O-92	Ultrafast electronic dephasing in low temperature saccharide glasses measured by photon echo spectroscopy *Yutaka Nagasawa, Mayu Ogasawara, Yukako Nakagawa, Masayasu Muramatsu, Kazuki Itoh, Hiroshi Miyasaka <i>Division of Frontier Materials Science, Graduate School of Engineering Science, Center for Quantum Science and Technology under Extreme Conditions, Osaka University, Toyonaka, Osaka 560-8531, Japan</i>
12:00 - 14:00	Lunch	<i>Foyer (1st FL), CH</i>
14:00 - 15:15	Session	<i>Large Lecture Hall (2nd FL), CH</i>
Principles of Cryopreservation-2 (continues)		
14:00-14:15	O-81	The dominance of warming rate over cooling rate in the survival of mouse oocytes subjected to a vitrification procedure *Peter Mazur, Shinsuke Seki <i>Fundamental and Applied Cryobiology Group, Department of Biochemistry and Cellular and Molecular Biology, The University of Tennessee, Knoxville, Tennessee 37996, USA</i>
14:15-14:30	O-82	Survival of mouse oocytes suspended in EAFS 10/10 vitrification solution after being cooled to -196°C on Cryotops at rates ranging from 95°C/min to 70,000°C/min and warmed at 610°C/min to 118,000°C/min *Peter Mazur, Shinsuke Seki, F.W. Kleinhans <i>Fundamental and Applied Cryobiology Group, Department of Biochemistry and Cellular and Molecular Biology, The University of Tennessee, Knoxville, Tennessee 37996, USA</i>
14:30-14:45	O-83	The temperature of intracellular ice formation in mouse embryos as a function of the developmental stage *Shinsuke Seki, Peter Mazur <i>Fundamental and Applied Cryobiology Group, Department of Biochemistry and Cellular and Molecular Biology, The University of Tennessee, Knoxville, Tennessee 37996, USA</i>
14:45-15:00	O-84	Effect of the expression of aquaporins 1 and 3 in mouse MII oocytes on the nucleation temperature for intracellular ice formation *Shinsuke Seki, Keisuke Edashige, Peter Mazur <i>Fundamental and Applied Cryobiology Group, Department of Biochemistry and Cellular and Molecular Biology, The University of Tennessee, Knoxville, Tennessee 37996 USA</i>
15:00-15:15	O-85	Effects of using slush nitrogen (SN₂) and various cryoprotectants (CPA) composition/concentrations on vitrification of mouse germinal vesicle (GV) – and metaphase II (MII) – oocytes S.K. Cha, B.Y. Kim, Y.Y. Lee, T.H. Kim, D.R. Lee, M.K. Kim, H.J. Won, J.E. Han, W.S. Lee, T.K. Yoon <i>Fertility Center of CHA General Hospital, CHA Research Institute, CHA University College of Medicine, Seoul 135-081, Korea</i>
14:00 - 15:00	Session	<i>Small Lecture Hall (1st FL), CH</i>

Low Temperature Preservation		
-------------------------------------	--	--

14:00-14:30	K-12	Effect of liposomes on storage stability of red blood cell membranes studied by FTIR spectroscopy Willem F. Wolkers, Christoph Stoll, Jelena Holovati, Jason P. Acker, Birgit Glasmacher <i>Institute of Multiphase Processes, Leibniz Universität Hannover, Germany</i>
14:30-14:45	O-93	The effect of supercoolant, Kaempferol 7-o-glucoside, heterotopic rat heart transplantation model *Shogo Shimada, Noboru Motomura, Osamu Kinoshita, Takeshi Yoshii, Ehson Karimov, Minoru Ono, Arata Murakami, Jun Kasuga, Seizo Fujikawa <i>Department of Cardiothoracic Surgery, University of Tokyo, Faculty of Medicine, Tokyo 113-8655, Japan</i>
14:45-15:00	O-94 CRY	Liposomes reduce red blood cell membrane damage due to hypothermic storage *Hart Stadnick, Jason P. Acker, Jelena L. Holovati <i>Canadian Blood Services, Research and Development, Edmonton, T6G 2R8, Canada, and Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, T6G 2B7, Canada</i>
15:15 - 15:45	Coffee Break	<i>Foyer (1st FL), CH</i>
15:45 - 16:30	Session	<i>Large Lecture Hall (2nd FL), CH</i>

Principles of Cryopreservation-2 (continues)		
---	--	--

15:45-16:00	O-86	Biomolecules for improvement of cryopreservation of human endothelial cells H. Sun, N. Hofmann, *B. Glasmacher <i>Institute of Multiphase Processes/Leibniz Universitaet Hannover, Hannover, Germany</i>
16:00-16:15	O-87	Equilibration of rabbit kidneys with vitrification solutions Gregory M. Fahy <i>21st Century Medicine, Inc., Fontana, CA 92336, USA</i>
16:15-16:30	O-88	Investigation of the cryoprotective effect of low-molecular-weight hyaluronic acid on human dermal fibroblast monolayers *Masanobu Ujihira, Akira Iwama, Makie Aoki, Kanako Aoki, Sayaka Omaki, Erika Goto, Kiyoshi Mabuchi <i>Graduate School of Medical Sciences and School of Allied Health Sciences, Kitasato University, Sagamihara, Kanagawa 228-8555, Japan</i>
15:45 - 16:30	Session	<i>Small Lecture Hall (1st FL), CH</i>

Non-Mammalian Cryopreservation		
---------------------------------------	--	--

15:45-16:00	O-95	Development of novel long term cryopreservation methods for recombinant <i>Escherichia coli</i> *Masato Okubo, Sanae Yamaoka, Miyuki Yamamoto, Kazunari K. Yokoyama, Yuich Obata, Takehide Murata <i>Gene Engineering Division, RIKEN BRC, Tsukuba, Ibaraki 305-0074, Japan</i>
16:00-16:15	O-96	Cryopreservation of Greenshell™ mussel (<i>Perna canaliculus</i>) sperm and post-thaw improvement using sperm motility stimulants *Samantha L. Gale, Serean L. Adams, John F. Smith, H. Robin Tervit, Lindsay T. McGowan, Rodney D. Roberts, Stephen C. Webb <i>Cawthron Institute, 98 Halifax Street East, Private Bag 2, Nelson, New Zealand</i>

		<i>Zealand</i>	
16:15-16:30	O-97	The effect of Tween 80 in permeabilizing the <i>Galleria mellonella</i> (L.) eggshell (Lepidoptera Pyralidae)	
		Pio Federico Roversi, Elena Cosi, Muhamad T. Abidalla	
		<i>Agriculture Research Council (CRA), Research Center for Agrobiolgy and Pedology, Cascine del Riccio, Via Lanciola, 12/A, 50125 Florence, Italy</i>	
18:00 - 21:00	CRYO2009 Banquet		<i>“Kinshi”, Sapporo Grand Hotel</i>

Poster Program (PA: Student Best Poster Award Competitors)

- | No. | Title |
|-----------|--|
| P-1 | Characterization of recrystallization inhibiting protein from <i>Patinopecten yessoensis</i>
*Hiroki Kobayashi, Hidehisa Kawahara, Hitoshi Obata
<i>Life Science and Biotechnology, Kansai University, 564-8680 Suita, Japan</i> |
| P-2 | Purifications of some AFPs using assay system of recrystallization inhibiting activity
*Hidehisa Kawahara, Maiko Fukuura, Hitoshi Obata
<i>Life Science and Biotechnology, Kansai University, 564-8680 Suita, Japan</i> |
| P-3 | Cloning, expression and partial characterization of antifreeze protein from a psychrophilic yeast isolated from the Arctic
*Jong Kyu Lee, Kyoung Sun Park, Soo Young Lee, Sung Ho Kang, Hak Jun Kim
<i>Division of Polar Biology and Ocean Sciences, Korea Polar Research Institute, Incheon, 406-840, Korea</i> |
| P-4 | Using dew-point method to detect the sublimation end-point of freeze-drying process
*Guo-Yan Zhou, Wei-Yue Wang, Jin Zhang, Fei Xu, Qi-Feng Wang, Bin-Hong Cao, Tse-Chao Hua
<i>Institute of Cryo-medicine and Food Refrigeration, University of Shanghai for Science and Technology (USST), Shanghai 200093, P.R. China</i> |
| P-5
PA | Development of desiccation tolerance in cultured cells of <i>Citrus sinensis</i>
*Hiroko Tanaka, Rie Hatanaka, Hisato Kunitake, Yasutake Sugawara
<i>Graduate School of Science and Engineering, Saitama University, Saitama 338-8570, Japan</i> |
| P-6 | Formulation and process development of multi-component freeze-dried pharmaceuticals
*K. Izutsu, K. Fujii, C. Yomota, T. Kawanishi, E. Yonemochi, K. Terada
<i>National Institute of Health Sciences, Setagaya, Tokyo 158-8501, Japan</i> |
| P-7 | The development of oocytes injected with freeze-dried rat sperm
*Takehito Kaneko, Masao Ohnishi, Naomi Nakagata
<i>Center for Animal Resources and Development (CARD), Kumamoto University, Kumamoto 860-0811, Japan</i> |
| P-8
PA | Stability of cell survival during long-term preservation in cultured cells of <i>Marchantia polymorpha</i> vitrified at ambient temperatures
*Rie Hatanaka, Yasutake Sugawara
<i>Graduate School of Science and Engineering, Saitama University, Saitama 338-8570, Japan</i> |
| P-9 | Effects of osmotic stress on the developmental competence of bovine cumulus oocyte complexes
X. Wang, A. Al Naib, D.W. Sun, *B.L. Liu, P. Lonergan
<i>University of Shanghai for Science and Technology, Shanghai 200093, P.R. China</i> |
| P-10 | Aspects of water status of various organs in drought tolerant cowpea plants exposed to drought stress by comparing to common bean
Masakazu Imamura, Chiho Egashira, Yushi Ishibashi, *Mari Iwaya-Inoue
<i>Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Fukuoka 812-8581, Japan</i> |
| P-11 | Model study of the desiccation-induced vitrification of group-3 late embryogenesis abundant proteins
*Takao Furuki, Tempei Shimizu, Takahiro Kikawada, Takashi Okuda, Tsuyoshi Takahashi, Hisakazu Mihara, Minoru Sakurai
<i>Center for Biological Resources and Informatics, Tokyo Institute of Technology, Yokohama, Kanagawa 226-8501, Japan</i> |
| P-12 | Improving desiccation tolerance of Chinese hamster ovary cells using a high-capacity trehalose transporter
Nilay Chakraborty, *Heidi Elmoazzen, Anthony Chang, Halong Vu, Martin Yarmush, |

- Mehmet Toner
Center for Engineering in Medicine and Surgical Services, Massachusetts General Hospital, Harvard Medical School and Shriners Hospital for Children, Boston, MA, USA
- P-13** **Freeze-thawing behavior of octyl- β -D-glucoside**
PA *Shigesaburo Ogawa, Koichi Asakura, Shuichi Osanai
Department of Applied Chemistry, Graduate School of Science and Technology, Keio University, Yokohama 223-8522, Japan
- P-14** **Raman spectroscopic study on the hydrophobic hydration structure in the glassy state**
*Yukihiro Yoshimura, Takahiro Takekiyo
Department of Applied Chemistry, National Defense Academy, Yokosuka, Kanagawa, Japan
- P-15** **Supercooling and vitrification of aqueous polyethyleneglycol solutions**
*K. Kajiwara, Y. Kitada, K. Tomizawa, H. Kanno
School of Bioscience and Biotechnology, Tokyo University of Technology, Hachioji, Tokyo 192-0982, Japan
- P-16** **Optical spectroscopic studies on the secondary structure of proteins in the freezing state**
*Takahiro Takekiyo, Timothy A. Keiderling, Yukihiro Yoshimura
Department of Applied Chemistry, National Defence Academy, Yokosuka, Kanagawa, 239-8686, Japan, and Department of Chemistry, University of Illinois at Chicago, Chicago, IL 60607, USA
- P-17** **Three-dimensional structure and dynamics of trehalose transporter TRET1 in *Polypedilum vandeplanki* as revealed by computer simulation**
PA *Taku Okawa, Takahiro Kikawada, Takashi Okuda, Minoru Sakurai
Center for Biological Resources and Informatics, Tokyo Institute of Technology, Yokohama 226-8501, Japan
- P-18** **Measurement of membrane hydraulic conductivity (L_p) and its activation energy (E_{Lp}) of bovine carotid artery endothelial cells using a perfusion microscope**
*Gang Zhao, Tetsuya Yamamoto, Hiroshi Takamatsu
Department of Mechanical Engineering, Kyushu University, Fukuoka 819-0395, Japan, and Department of Modern Mechanics, University of Science and Technology of China, Hefei 230027, Anhui, P.R. China
- P-19** **Brillouin and Raman scattering of lysozyme crystals in lower alcohol aqueous solutions**
*Hitoshi Kanazawa, Eiji Hashimoto, Yuichiro Aoki, Takahiro Ishii, Seiji Kojima
Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8573, Japan
- P-20** **Salt effects on the conformational structure of LEA protein from *Polypedilum vanderplanki* and of its model peptide**
*Takao Furuki, Tempei Shimizu, Mitsuhiro Miyazawa, Takahiro Kikawada, Takashi Okuda, Minoru Sakurai
Center for Biological Resources and Informatics, Tokyo Institute of Technology, Yokohama, Kanagawa 226-8501, Japan
- P-21** ***In situ* observation of xenon hydrate formation in onion tissue by using NMR and powder X-ray diffraction measurement**
PA *Hiroko Ando, Satoshi Takeya, Yoshinori Kawagoe, Yoshio Makino, Toru Suzuki, Seiichi Oshita
Graduate School of Agriculture and life science, The University of Tokyo, Tokyo, 113-8657, Japan
- P-22** **Anomalous ice nucleation behavior in aqueous polyvinyl alcohol solutions**
*Maito Koga, Shigesaburo Ogawa, Shuichi Osanai
Department of Applied Chemistry, Graduate School of Science and Technology, Keio University, Yokohama 223-8522, Japan
- P-23** **Effect of heat stress on the nanoparticle-induced alterations of protein expression pattern**

Yu-Mi Jeon, Yoo-Na Seo, Seul-Ki Park, Jeom-Ji Kim, Hyung-Sun Youn, *Mi-Young Lee
Department of Medical Biotechnology, SoonChunHyang University, Asan, Chungnam, 336-600, Korea

- P-24 Insects with low supercooling points distributed in the area of the Asian cold pole**
*N.G. Li, V.L. Osakovsky, Y.V. Ermakova
Institute for Biological Problems of Cryolitozone, Yakutsk, 677980, Russia
- P-25 Thermoregulation of cold-adapted birds and mammals of Yakutia (North-East of Siberia)**
*N.G. Solomonov, A.I. Anoufrieve, Ar. P. Isayev, Nikolay A. Nakhodkin, T.N. Solomonova, V.F. Yadrikhinskiy, N.I. Mordosova, I.M. Okhlopkov
Institute for Biological Problems of Cryolithozone Siberian Branch of Russian Academy of sciences (IBPC SB RAS), Yakutsk, 677980, Russia
- P-26 Cloning and characterization of a gene encoding a β -glucosidase-like protein from rice that is homologous to the Arabidopsis sensitive to freezing 2 gene**
*Takashi Akiyama, Rodjana Opassiri, Mariena Ketudat-Cairns, James R. Ketudat-Cairns
National Agricultural Research Center for Hokkaido Region, Sapporo 062-8555, Japan
- P-27 Why do isolated tissues from dormant buds result in poorer freezing resistance than those from whole buds under extraorgan freezing?**
PA
*Keita Endoh, Jun Kasuga, Keita Arakawa, Seizo Fujikawa
Research Faculty and Graduate School of Agriculture, Hokkaido University, Sapporo, 060-8589 Japan
- P-28 Differential protein expression patterns associated with temperature stress in polar green alga, *Chlamydomonas sp.***
Kwang-Man Choi, EonSeon Jin, *Mi-Young Lee
Department of Medical Biotechnology, Soonchunhyang University, Asan, Chungnam, 336-600, Korea
- P-29 Protein phosphatase 2C-regulated ABA signaling processes leading to freezing tolerance in bryophytes**
PA
*Salma Begum Bhyan, Ken Tougane, Kenji Komatsu, Yoichi Sakata, Kimitsune Ishizaki, Katsuyuki T. Yamato, Takayuki Kohchi, Daisuke Takezawa
Graduate School of Science and Engineering, Saitama University, Japan
- P-30 Chilling stress induces galactinol synthase (*OsGols1*) in rice seedling**
PA
*Thuy Phan, Yushi Ishibashi, Takashi Yuasa, Mari Iwaya-Inoue
Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Fukuoka 812-8581, Japan
- P-31 Analysis of freezing events in blueberry stems visualized using differential infra-red thermography**
*Hideyuki Yamazaki, Masaya Ishikawa
Environmental Stress Research Unit, National Institute of Agrobiological Sciences, Tsukuba, Ibaraki, 305-8602, Japan
- P-32 Deep supercooling and freezing behaviors in the leaf blade and leaf sheath of a cold hardy dwarf bamboo, *Sasa kurilensis*, analyzed using cryomicroscopy**
*Reiko Fukami, Akira Kuriyama, Masaya Ishikawa
Environmental Stress Research Unit, National Institute of Agrobiological Sciences, Tsukuba, Ibaraki, 305-8602, Japan
- P-33 Effect of low root temperature on water uptake and aquaporin expressions in rice plants**
*Mari Murai-Hatano, Tsuneo Kuwagata, Junko Sakurai, Hidehiro Hayashi, Kiyoshi Nagasuga, Arifa Ahamed, Katsuko Takasugi, Keiko Fukushi
National Agricultural Research Center for Tohoku Region, Climate Change Research Team, Morioka 020-0198, Japan
- P-34 Generality of calcium-dependent freezing tolerance in plants**
PA
*Satoshi Kaneko, Tomokazu Yamazaki, Matsuo Uemura, Yukio Kawamura
Cryobiofrontier Research Center, Iwate University, Morioka 020-8550, Japan
- P-35 Basic study on the storage of agricultural produce by using xenon hydrate**

- *L. Wang, H. Ando, Y. Kawagoe, Y. Makino, S. Oshita
Graduate School of Agricultural and Life Sciences, The University of Tokyo, Tokyo, Japan
- P-36 Utilization of snow pile removed from streets in downtown for cooling brown rice storehouse**
*Sakiko Fujikawa, Shuso Kawamura, Keiji Okada, Fujio Tsuchiya
Graduate School of Agricultural Science, Hokkaido University, Sapporo, Hokkaido 060-8589, Japan
- P-37 The effect on extracting sugar from wood due to introduction of freezing step in bioethanol production**
*Takumi Nagashima, Akira Narumi, Yasuhiro Iida
Graduate student, Kanagawa Institute of Technology, Atsugi, Kanagawa 243-0292, Japan
- P-38 De-mixing and compartmentalization of supercooled aqueous acetone solutions at cryogenic temperatures**
Jason Malsam, *Alptekin Aksan
Biostabilization Laboratory, Department of Mechanical Engineering, University of Minnesota Minneapolis, MN 55455, USA
- P-39 PA Effect of HA nanoparticles on thermodynamic parameters of cryoprotective agents**
*Baotong Hao, Baolin Liu, Senjie Rong, Yan Zhou
Institute of Cryo-Bio-Medical Technology, University of Shanghai for Science and Technology, Shanghai, 200093, P.R. China
- P-40 Time-series recrystallization of ice crystals during constant temperature storage of rapidly frozen tissues**
*Hiroshi Ishiguro, Hirokazu Imai
Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu, Fukuoka 808-0196, Japan
- P-41 Three-dimensional microscopic behavior of ice crystals and cells during directional solidification of muscle tissues treated with DMSO**
Hiroshi Ishiguro, Akinobu Kataori, *Masakazu Nozawa
Institute of Fluid Science, Tohoku University, Sendai, Miyagi 980-8577, Japan
- P-42 Effects of dimethyl sulfoxide concentrations on apparent specific heat of rabbit aorta during freezing change as measured by differential scanning calorimeter**
*Yi Xu, Tse-Chao Hua, Guo-yan Zhou, Fei Xu, Bao-lin Liu, Qi-feng Wang
Institute of Biothermal Technology, Shanghai University of Science & Technology, Shanghai, 200093, P.R. China
- P-43 A primary study on the osmotic behavior of immature (germinal vesicle, GV) and in vitro matured (metaphase II, MII) bovine oocyte**
X. Wang, A. Al Naib, D.W. Sun, *B.L. Liu, P. Lonergan
University of Shanghai for Science and Technology, Shanghai 200093, P.R. China
- P-44 Intracellular ice formation in non-ideal solutions: a model for freezing of cells**
*Gang Zhao, Hiroshi Takamatsu
Department of Mechanical Engineering, Kyushu University, Fukuoka 819-0395, Japan and Department of Modern Mechanics, University of Science and Technology of China, Hefei 230027, Anhui, P.R. China
- P-45 Cryopreservation of French plant genetic resources collections (CRYOVEG)**
*Florent Engelmann, Emilie Balsemin, Teresa Barreneche, Philippe Chatelet, Jean-Eric Chauvin, Emmanuel Couturon, Franck Curk, Marie-Ange Dantec, Jean-Paul Dantec, Stéphane Dussert, Laurence Feugey, Yann Froelicher, Lydie Fouilhaux, Franciane Gamiette, Agnès Grapin, Michel Grisoni, Philippe Guérif, Arnaud Guyader, Alain Label, François Luro, Bernard Moulin, Martine Muller, André Peyrière, Yvon Prigent, Michel Renard, Michel Roux-Cuvelier, Danièle Roques, Suzia Rubens, Jocelyne Sapotille, Catherine Souchet, David Teyssedre
IRD Montpellier, France, and Bioversity International, Italy
- P-46 Gelled droplet vitrification method; an easy and efficient cryopreservation for shoot tips of cultivated and wild potato cultivars**
*Dai Hirai

- Hokkaido Central Agricultural Experiment Station, Naganuma, Hokkaido 069-1395, Japan*
- P-47 Cryopreservation of shoot apices of cranberry and highbush blueberry *in-vitro* cultures**
 *Daisuke Kami, Takashi Kikuchi, Keita Sugiyama, Takashi Suzuki
Research Faculty and Graduate School of Agriculture, Hokkaido University, Sapporo 060-8589, Japan, and National Agricultural Research Center for Hokkaido Region, Sapporo 062-8555, Japan
- P-48 Cryopreservation of the axial meristem of *Crocus sativus* L.**
 PA *Saeid MalekZadeh, M. Khosrowshahli, M. Taeb
Department of Agricultural Biotechnology, Science and Research Branch, Islamic Azad University, Tehran, Iran
- P-49 Genetic stability assessment of plants regenerated from wasabi shoot tips cryopreserved for 10 years**
 *Toshikazu Matsumoto, Daisuke Tanaka, Takashi Akihiro, Shinya Maki, Takao Niino
Shimane Agricultural Technology Center, Izumo, Shimane 693-0035, Japan
- P-50 Desiccation and cryopreservation of actively growing cultured plant cells**
 Hideyuki Yamazaki, Ryusuke Zama, *Akira Kuriyama
Graduate School of Science and Engineering, Tokyo Denki University, Hatoyama, Saitama 350-0394, Japan
- P-51 Optimization of protein extraction method for proteomic analysis of vanilla apices subjected to cryoprotective treatments**
 *S.E. Valdés-Rodríguez, M.T. González-Arno, B. Jiménez-Francisco, B. Durán-Sánchez, A. Guerrero, C.E. Lázaro-Vallejo
CINVESTAV, Irapuato, Guanajuato, PC 36500, México
- P-52 Changes in alginate bead water status and dry weight content during encapsulation-dehydration and encapsulation-vitrification protocols**
 *R. Gámez-Pastrana, M.T. González-Arno, Y. Martínez-Ocampo, F. Engelmann
Universidad Veracruzana, Córdoba, Veracruz 94500 México
- P-53 COST Action 871: Cryopreservation of crop species in Europe (CRYOPLANET)**
 *Florent Engelmann, Joachim Keller, Paul Lynch, Bart Panis, Pawel Pukacki, M. Angeles Revilla Bahillo, Marjatta Uosukainen
IRD, UMR DIAPC, BP 64501, 34394 Montpellier cedex 5, France, and Bioversity International, Via dei Tre Denari 472a, 00057 Maccarese, Rome, Italy
- P-54 Effect of methanol and DMSO exposure on mitochondrial activity and distribution in stage III ovarian follicles of zebrafish (*Danio rerio*)**
 T. Zampolla, E. Spikings, T. Zhang, *D.M. Rawson
LIRANS Institute of Research in the Applied Natural Sciences, University of Bedfordshire, Luton, Bedfordshire, LU2 8DL, United Kingdom
- P-55 Change in the expression of aquaporin 1 in *Bombina orientalis* kidney under low temperature**
 *Chan Jin Park, Jae Eun Lee, Kyung Jin Choi, Myung Chan Gye
Department of Life Science, Hanyang University, Seoul 133-791, Korea
- P-56 The search of new cryoprotective compounds for marine invertebrate cells**
 PA *A.V. Boroda, A.A. Andreev, E.Ya. Kostetsky, N.A. Odintsova
A.V. Zhirmunsky Institute of Marine Biology of FEB RAS, Vladivostok, 690041, Russia
- P-57 Effects of cryoprotectant on the embryos of banded coral shrimp (*Stenopus hispidus*), preliminary studies to establish freezing protocols**
 S. Tsai, *C. Lin
National Museum of Marine Biology & Aquarium, Checheng, Pingtung, 944, Taiwan
- P-58 Improving cryopreservation of Greenshell Mussel (*Perna canaliculus*) oocytes to produce higher D larvae yield**
 *Samantha L. Gale, H. Robin Tervit, Serean L. Adams, John F. Smith, Lindsay T. McGowan, Rodney D. Roberts, Steven F. Mullen
Cawthron Institute, Nelson, New Zealand
- P-59 Cryopreservation of toxic dinoflagellates and cyanobacteria to preserve toxin**

- production capability**
 *Samantha L. Gale, Lesley Rhodes, Serean L. Adams, H. Robin Tervit, John F. Smith, Susie Wood, Doug Mountfort, Janet Adamson, Kirsty Smith, Anne Immers
Cawthron Institute, Nelson, New Zealand
- P-60 Effect of cryoprotectant treatment and chilling on oxidative stress in zebrafish (*Danio rerio*) early ovarian follicles**
 Fataneh Ghafari, Emma Spikings, David Rawson, *Tiantian Zhang
LIRANS Institute of Research in the Applied Natural Sciences, University of Bedfordshire, Luton, UK
- P-61 Effect of cryoprotectants and chilling on the metaphase I spindle of Greenshell™ Mussel (*Perna canaliculus*) oocytes**
 *Steven F. Mullen, Serean L. Adams, Robin H. Tervit, Lindsay McGowan, John F. Smith, Samantha L. Gale
21st Century Medicine, Fontana, California, USA
- P-62 Study on cryopreservation without giving the damage to cell**
 *Akemi Eguchi, Akira Narumi, Yashuhiro Iida
Graduated Student, Kanagawa Institute of Technology, Atsugi, Kanagawa 243-0292, Japan
- P-63 Tolerance to freezing and maintenance of fertilizing ability in rat sperm**
 *Masao Ohnishi, Naomi Nakagata, Takehito Kaneko
Center for Animal Resources and Development (CARD), Kumamoto University, Kumamoto 860-0811, Japan
- P-64 Delivering cholesterol to boar sperm membranes improves cryosurvival**
 PA *Elenice A. Moraes, Ciro A.A. Torres, Paula L. Romualdo, James K. Graham
Department of Animal Science, Federal University of Vicosa, Vicosa, MG, Brazil
- P-65 The *in vitro* fertilization rate of cryopreserved C57BL/6 strain mouse sperm**
 *Naomi Nakagata, Toru Takeo
Division of Reproductive Engineering, Center for Animal Resources and Development, Kumamoto University, Kumamoto 860-0811, Japan
- P-66 Effect of vitrification cryopreservation on viscoelasticity of rabbit Achilles tendons**
 *Qianfeng Yu, Gang Zhao
Graduate School of Science and Engineering, Saitama University, Saitama 338-8570, Japan
- P-67 Role of cryoprotective effect of SSS on bovine oocytes during vitrification**
 *C. Mori, M. Kuwayama
Kato Ladies Clinic, Tokyo 1600023, Japan
- P-68 Cryopreservation of freshly isolated and expanded mesenchymal stem/progenitor cells derived from human fetal liver**
 N.G. Skorobogatova, A.N. Novikov, V.P. Grischuk, Yu.A. Petrenko, * B.J. Fuller, A. Yu Petrenko
University Department of Surgery and Liver Transplant Unit, Royal Free & UCL Medical School, UCL, UK
- P-69 Accelerated vascular allograft calcification in the young is related to active bone formation**
 *Haruo Yamauchi, Noboru Motomura, Ung-il Chung, Masataka Sata, Daiya Takai, Aya Saito, Shinichi Takamoto
Department of Cardiothoracic Surgery, University of Tokyo School of Medicine, Tokyo, Japan, and Department of Cardiovascular Surgery, Mitsui Memorial Hospital, Tokyo, Japan
- P-70 Cryopreservation of cord red blood cells for intrauterine and neonatal transfusions**
 *Mariia Zhurova, Jason P. Acker, Greg Denomme
Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, AB T6G 2R8, Canada, and Research and Development, Canadian Blood Services, Edmonton, AB T6G 2R8, Canada
- P-71 Effects of bioactive gases on rat liver cold preservation**
 Cecilia Balaban, Laura Navone, Joaquín V. Rodríguez, *Barry J. Fuller, Brian Mann,

Roberto Motterlini, Edgardo E. Guibert
University Department of Surgery and Liver Transplant Unit, Royal Free & UCL Medical School, UK

P-72 Evaluation of a field-portable, controlled rate freezer for the preservation of *Acropora palmata* spermatozoa and oocytes

J.P. Acker, E.J. Woods, M. Hagedorn
Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, AB, Canada, and Canadian Blood Services, Research and Development, Edmonton, AB, Canada