

Sunday July 24, 2005

Opening Remarks:

Conference Co-chairs: Allison Hubel and John Bischof

Location: Snowflake 1

Time: 7:50-8:00 am

Plenary Session:

Fundamentals of Biopreservation

p 3-4

Session Chair(s): David Pegg and Art Rowe

Location: Snowflake 3

Time: 8:00 –10:00 am

| <u>Time</u> | <u>Title</u> |
|-------------|--|
| 8:00-8:30 | <i>Extra-and intracellular ice formation in mouse oocytes and oocytes of the frog Xenopus</i> Author: Mazur, P. |
| 8:30-9:00 | <i>Vitrification as an approach to cryopreservation</i> Author: Fahy, G. |
| 9:00-9:30 | <i>Phase transitions during freeze-drying</i> Author: Suryanarayanan, R. |
| 9:30-10:00 | <i>Hypothermic organ preservation</i> Author: Southard, J. |

Hypothermic Storage Symposium

p 5-6

Session Chair(s): Jon McAnulty and Jim Southard

Location: Snowflake 1

Time: 10:30 – 12:00 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 10:30-10:50 | <i>The role for growth factors in hypothermic preservation</i> Author: *McAnulty, J. F. |
| 10:50-11:10 | <i>Cellular and molecular mechanisms of cold storage injury</i> Author: *Rauen, U., de Groot, H. |
| 11:10-11:30 | <i>Hypothermic machine perfusion of livers</i> Author: *Lee, C. |
| 11:30-11:50 | <i>An approach to universal tissue preservation in vivo: Demonstration of efficacy in pre-clinical models of profound hypothermic cardiac arrest</i> Author: *Taylor, M. J. |

* Invited speakers

Stem Cell Preservation

p 7-9

Session Chair(s): Allison Hubel and John Critser

Location: Snowflake 2

Time: 10:30–12:00 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|---|
| 10:30-10:45 | <i>“Standard” freezing and storage protocols dramatically diminish expression of Oct-4 pluripotency marker in human embryonic stem cells</i> Author: Katkov, I. I., Kim, M. S., Levine, F. |
| 10:45-11:00 | <i>Comparison of membrane permeability characteristics of multiple mouse embryonic stem cell lines</i> Author: Benson, C. M. K., Benson, J. D., Critser, J. K. |
| 11:00-11:15 | <i>Apoptotic cell death contributes significantly to peripheral blood mononuclear cells cryopreservation failure</i> Author: Baust, J. M., Cosentino, M., Buskirk, R. V., Baust, J. G. |
| 11:15-11:30 | <i>Long-term storage of peripheral blood progenitor cells (PBPC) at –80°C leads to a pronounced decrease of the clonogenic potential compared to <-170°C storage in the vapor phase over liquid nitrogen</i> Author: Sputtek, A., Rowe, A. W., Kühnl, P. |
| 11:30-11:45 | <i>Cryosensitivity of hemopoietic and non-hemopoietic stem cells depending on ontogenesis stage in heterogeneous cell suspensions</i> Author: Tsutsayeva, A. A., Glushko, T. A., Kudokotseva, O. V., Nardid, O. A., Tsymbal, L. V., Zheltyakova, I. A., Brovko, E. V., Sokol, L. V., Puryшева, V. Y. |
| 11:45-12:00 | <i>Cryopreservation of adult stem cells cultured as neurospheres</i> Author: Kuleshova, L. L., Tan, C. K. F., Dawe, G. S. |

Cell and Tissue Preservation I

p 11-13

Session Chair(s): Birgit Glasmacher and Mike Taylor

Location: Snowflake 1

Time: 1:00-2:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-----------------------|---|
| 1:00-1:15 | <i>Optimal cryopreservation of human adipose tissues: A comprehensive study</i> Author: Cui, X. D., Fink, B. F., Gao, D. Y., Vasconez, H. C., Pu, L. L. Q. |
| 1:15-1:30 | <i>Cryopreservation of cell seeded 3D collagen scaffolds</i> Author: Kuberka, M., Müller-Meskamp, S., Rau, G., Glasmacher, B. |
| Crystal contestant | |
| 1:30-1:45 | <i>Osmotic events during the introduction and removal of DMSO from mammalian cells</i> Author: Meryman, H. T., Williams, R. J. |
| 1:45-2:00 | <i>Cryoprotectant penetration into intact porcine articular cartilage</i> Author: Sharma, R., Law, G. K., Mcgann, L. E., Jomha, N. M. |
| 2:00-2:15 | <i>Improved cryopreservation of vascular tissue</i> Author: Snyder, K. K., Baust, J. M., VanBuskirk, R. G., Baust, J. G. |

Drying and Vitrification I

p 15-17

Session Chair(s): Sankha Bhowmick and Al Aksan

Location: Snowflake 2

Time: 1:00-2:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|---|
| 1:00-1:15 | <i>Low frequency dielectric thermal analysis (DETA) for freeze drying protocol development and optimization</i> Author: Sun, W. Q., Sheng, X. |
| 1:15-1:30 | <i>Comparison of cultivated and wild potato varieties in cryopreservation of potato germplasm collections by droplet vitrification procedure</i> Author: Haeng-Hoon, K., Yoon, J. W., Cho, E. G., Ko, H. C., Hwang, H. S., Sohn, J. K. |
| 1:30-1:45 | <i>Not so thick glassy water by liquid quenching</i> Author: Brower, W., Bigelow, L., Schedgick, D. |
| 1:45-2:00 | <i>Study on cryopreservation of cell-biomaterial constructs by vitrification</i> Author: Wu, Y. N., Chang, S., Yu, H., Kuleshova, L. L. |
| 2:00-2:15 | <i>Toward large organ vitrification: Extremely low critical cooling and warming rates of M22 vitrification solution</i> Author: Wowk, B., Fahy, G. M. |

Cell and Tissue Preservation II

p 19-22

Session Chair(s): Charles Lee and Ursula Rauen
Location: Snowflake 1
Time: 3:00-4:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 3:00-3:15 | <i>The bioenergetics and metabolism of primary hepatocytes cryopreserved with 3-O-Methyl-Glucose</i> Author: Roach, K., Daly, M., Sugimachi, K., Toner, M. |
| 3:15-3:30 | <i>Cryopreservation of articular cartilage 1: Mechanisms of cryoinjury</i> Author: Pegg, D. E., Wang, L. H., Vaughan, D., Hunt, C. J. |
| 3:30-3:45 | <i>Cryopreservation of articular cartilage 2: Vitrification methods</i> Author: Pegg, D. E., Wang, L. H., Vaughan, D. |
| 3:45-4:00 | <i>Improved energy recovery of warm ischemic livers during hypothermic machine perfusion with anaplerotic substrates</i> Author: Jain, S., Lee, S. H., Berthiaume, F., Zhang, J. X., Clemens, M. G., Lee, C. Y. |
| 4:00-4:15 | <i>Effect of gaseous condition during extended hypothermic machine perfusion preservation on liver function</i> Author: Joneja, J. S., Wang, L., Zhang, J. X., Clemens, M. G., Lee, C. Y. |
| 4:15-4:30 | <i>Cryopreservation of human pancreatic islets toward clinical transplantation</i> Author: Omori, K., Valiente, L., Rawson, J., Ferreri, K., Todorov, I., Riggs, I. A., Kandeel, F., Mullen, Y. |

Business of Cryobiology Panel Session

Session Chair(s): John G. Baust
Location: Snowflake 2
Time: 3:00-4:30 pm

| Panelist | Panelist Title / Company/ Affiliation |
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|----------|---------------------------------------|

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|---------------|---|
| *Heacox, A. | VP, CryoLife, Inc. |
| *Fahy, G. | 21st Century Medical, Inc |
| *Toner, M. | Center for Engineering in medicine, Harvard |
| *Baust, J. M. | Cell Preservation Services, Inc. |
| *Taylor, M. | Organ Recovery Systems, Inc. |

Notes: This session will be a panel discussion. Each speaker will be given 5-10 minutes followed by panel discussion. * Indicates invited panelist

Poster Session I:

Sunday July 24, 2005

Location: Snowflake 3

Time: 5:00-7:00 pm

Δ = Poster award contestants

| Topic: Stem Cell Preservation | | p 23-24 |
|--|--|----------------|
| 1. | <i>Laser assisted freezing of cell suspensions</i> | |
| Δ | Author: Huckaby, K., Kandra, D., Devireddy, R. V. | |
| 2. | <i>New approaches to the problem of human cord blood hemopoietic cell cryopreservation</i> | |
| | Author: Grischenko, V. I., Babijchuk, L. A., Ryazantsev, V. V., Zubov, P. M., Timchenko, O. L. | |
| 3. | <i>Integrity of hematopoietic bone marrow stem cells in animals with autoimmune pathology depending on cryopreservation regimen</i> | |
| | Author: Goltsev, A. N., Kozlova, Y. A., Dubrava, T. G., Lutsenko, E. D., Ostankov, M. V. | |
| 4. | <i>Freezing storage of adult stem cells</i> | |
| Δ | Author: Thirumala, S., Gimble, J. M., Devireddy, R. | |
| 5. | <i>Liposomal Delivery of Intracellular Dissaccharides for Applications in Stem Cell Biopreservation</i> | |
| Δ | Author: Scott, K., Gyongyossy-Issa, M., Acker, J. | |
| Topic: Cryosurgery | | p 25-27 |
| 6. | <i>An efficient numerical technique for computerized planning of cryosurgery</i> | |
| Δ | Author: Rossi, M., Rabin, Y. | |
| 7. | <i>Finite element analysis of the temperature field around embedded cryoprobe and its influencing factors</i> | |
| | Author: Zhao, G., Han, X., He, Q., Yang, J., Gao, D. | |
| 8. | <i>Cellular level effects of freezing smooth muscle cells: Application in cryoplasty and cryopreservation</i> | |
| Δ | Author: Balasubramanian, S. K., Hubel, A., Bischof, J. C. | |
| Topic: Cell and Tissue Preservation | | p 28-33 |
| 9. | <i>Clinical success of hypothermically stored human osteoarticular cartilage grafting and implications for cryopreserved cartilage</i> | |
| | Author: Dawson, P., Davidson, P., Rivenburgh, D., Cameron, A., Walsh, S., Heacox, A. | |
| 10. | <i>Usage of cryopreserved chorion tissue when treating mother-fetus infection</i> | |
| | Author: Musatova, I. B., Prokopyuk, V. Y. | |
| 11. | <i>Influence of directional solidification on the post-thaw vitality of corneal layers</i> | |

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| Δ | Author: Janke, A., Salla, S., Walter, P., Rau, G., Glasmacher, B. |
| 12. | <i>Cryopreservation of human adipocytes</i> |
| Δ | Author: Gempt, J., Petersen, A., Wolters, T., Pallua, N., Glasmacher, B. |
| 13. | <i>Factors affecting the success of cryosurgery: An in vitro study of LNCaP and PC-3 cell lines</i> |
| Δ | Author: Klossner, D. P., Clarke, D. M., Baust, J. M., Buskirk, R. V., Gage, A., Baust, J. G. |
| 14. | <i>Storage of re-cultured SPEV cells line at moderately low temperatures</i> Author: Grischenko, V. I., Vysekantsev, I. P., Petrenko, T. P., Gurina, T. M., Martsenyuk, V. F., Kudokotseva, E. V., Koschiy, S. V. |
| 15. | <i>Cryopreservation of human fibroblasts and epithelial cells: Comparison of different freezing methods</i> |
| Δ | Author: Bernemann, I., Kuberka, M., Petersen, A., Rau, G., Glasmacher, B. |
| 16. | <i>Cryopreservation of composite tissue flaps and isotransplantation</i> Author: Cui, X. D., Rinker, B., Fink, B. F., Vasconez, H. C., Gao, D. Y. |
| 17. | <i>Cryopreservation of a model tissue engineered pancreatic substitute</i> Author: Mukherjee, I. N., Song, Y. C., Sambanis, A. |
| 18. | <i>Investigation of serum-free cell banking for clinical trial and commercial cell lines</i> Author: Fuhr, B., Fan, P., Shaw, M., Sterner, J., Ashey, L., Moldenhauer, J., Miroquesada, G. |
| 19. | <i>Measurement of the kinetics of intercellular ice propagation in endothelial cells using micropatterned tissue constructs</i> |
| Δ | Author: Stott, S. L., Karlsson, J. O. M. |
| Topic: Gamete Preservation p 33-36 | |
| 20. | <i>Low-density lipoproteins (LDL) concentration affects membrane cryodamage susceptibility of ram spermatozoa</i> Author: Castro-González, D., Muro, J., Bernardo, J., Iglesias, M., García-Macías, V., Álvarez, M., Anel, E., Herráez, P., Ane, L., de Paz, P., Martínez-Pastor, F. |
| 21. | <i>Heat shock protein HSP70 expression in mouse blastocysts vitrified and thawed during in vitro development</i> Author: Lee, S., Lee, J., Jung, Y., Lee, J., Lee, Y., Lee, S., Choi, K., Min, C. |
| 22. | <i>Changes to the morphology of the metaphase II spindle of in vitro matured porcine oocytes following exposure to anisotonic solutions</i> Author: Mullen, S., Men, H., Walters, E., Critser, J. |
| 23. | <i>Blastocysts derived from mouse oocytes cryopreserved by ultra-rapid cooling in low concentrations of cryoprotectants</i> Author: Yamauchi, Y., VandeVoort, C. A., Leibo, S. P. |
| 24. | <i>Embryonic development of felid oocytes injected with freeze-dried or air-dried spermatozoa</i> Author: Moisan, A. E., Leibo, S. P., Lynn, J. W., Gómez, M. C., Pope, C. E., Dresser, B. L., Godke, R. A. |
| 25. | <i>Determination of mouse oocyte plasma membrane permeability for cryoprotectants within homologous series of diols and amides</i> Author: Smolyaninova, Y. I., Linnik, T. P., Gordiyenko, O. I. |
| Topic: Drying and Vitrification p 36-40 | |
| 26. | <i>Introduction of monomeric sugars and sugar alcohols into mammalian cells through swelling-activated channels</i> Author: Reuss, R., Ludwig, J., Shirakashi, R., Ehrhart, F., Zimmermann, H., Schneider, S., Weber, M. M., Zimmermann, U., Schneider, H., Sukhorukov, V. L. |

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| 27. Δ | <i>Drying storage of adipose tissue derived adult stem cells</i> Author: Mittal, S., Pinisetty, D., Devireddy, R. |
| 28. | <i>Cumulative osmotic stress and dehydration kinetics of mammalian cells in the presence of trehalose</i> Author: Jairam, H., Chakraborty, N., Elliott, G. D. |
| 29. Δ | <i>Quantitative study on the effects of sugars on membrane phase transitions</i> Author: Lenné, T., Bryant, G., Koster, K. L. |
| 30. | <i>Probing trehalose uptake in human mesenchymal stem cell for the long term cells for long term cell preservation</i> Author: Auh, J. H., Peavy, T. R., Jamil, K., Oliver, A. E., Meyers, S. A., Tablin, F., Crowe, J. H. |
| 31. Δ | <i>Resistance of freeze-dried human acellular matrix to gamma irradiation: Changes of biomechanical property and cellular interaction</i> Author: Gouk, S. S., Lim, T. M., Teoh, S. H., Sun, W. Q. |
| 32. | <i>DNA damage following cellular desiccation effects cell viability</i> Author: Baust, J. M., Fowler, A., Toner, M. |
| 33. | <i>Exogenous lipids affect the acetylcholinesterase activity in freeze dried human RBCs</i> Author: Banerjee, M., Kheirloomoom, A., Satpathy, G.R., Török, Z., Bali, R., Novaes, R., Little, E., Manning, D., Van Ly, H., Tsvetkova, N. M., Crowe, J. H., Tablin, F. |

Monday July 25, 2005

Plenary Session:

Cryosurgery and Cryomedicine

p 41-42

Session Chair(s): Andy Gage and William Bourne

Location: Snowflake 3

Time: 8:00 –10:00 am

| <u>Time</u> | <u>Abstract title</u> |
|-------------|---|
| 8:00-8:40 | <i>The efficacy of LA Cryo tissue ablation of atrial fibrillation</i> Author: Avitall, B., Lafontaine, D., Aleksonis, D. |
| 8:40-9:20 | <i>Islet transplantation – Past, present and future</i> Author: Rajotte, R. |
| 9:20-10:00 | <i>Human oocyte cryopreservation: Past, present and future</i> Author: Toth, T. |

Cryosurgery I

p 43-45

Session Chair(s): Robert Griffin and John M. Baust

Location: Snowflake 1

Time: 10:30 am –12:00 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 10:30-10:50 | <i>Magnetic resonance imaging thermometry of frozen tissue</i> Author: *Butts, K., Wansapura, J., Daniel, B. |
| 10:50-11:05 | <i>Exploring the effects of cryotherapy on cardiac tissue</i> Author: Ripley, K., Olsen, D., Van Vleet, J. |
| 11:05-11:20 | <i>Aggressive ice crystals during ice-cell interactions in invertebrate salivary glands</i> Author: Berger, W. K. |
| 11:20-11:35 | <i>Physiology of iceball periphery in solid tumors and potential for combination therapy</i> Author: Griffin, R., Williams, B., Visaria, R., Swanlund, D., Bischof, J. |
| 11:35-11:50 | <i>Use of X-ray tomography to map crystalline and glassy phase microstructure in bulk frozen biomaterials.</i> Author: Bischof, J. C., Mahr, B., Behling, M., Mewes, D. |

* Invited speakers

Gamete Cryopreservation I

p 47-48

Session Chair(s): Ken Roberts and James Graham

Location: Snowflake 2

Time: 10:30 am –12:00 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 10:30-11:00 | <i>Biophysical and molecular aspects of cryoinjury to spermatozoa</i> Author: *Meyers, S. |
| 11:00-11:30 | <i>Adding cholesterol to sperm membranes improves cell cryosurvival</i> |

- Author: *Graham, J. K., Moe, E., Moore, A.
 11:30-11:45 *Effect of seminal plasma proteins on capacitative changes in cooled and frozen*
 Crystal *porcine sperm*
 contestant Author: Vadnais, M., Roberts, K.
 11:45-12:00 *Cooling rate influences motility and acrosomal integrity in the endangered black-footed*
ferret (Mustela nigripes)
 Author: Santymire, R. M., Marinari, P. E., Kreeger, J. S., Wildt, D. E., Howard, J. G.
 * Invited speakers

Cryosurgery II

p 49-51

Session Chair(s): Dominic Clarke and Bumsoo Han
 Location: Snowflake 1
 Time: 1:00-2:30 pm

| Time | Abstract title |
|-----------|--|
| 1:00-1:15 | <i>Continued understanding of the molecular mechanisms involved in freezing-induced cell death</i> Author: Clarke, D. M., Gage, A. A., VanBuskirk, R. G., Baust, J. G., Baust, J. M. |
| 1:15-1:30 | <i>A suggestion for cryosurgery of tumors via ice formation from an undercooled liquid</i> Author: Brower, W., Schedgick, D. |
| 1:30-1:45 | <i>Utilization of Bcl-2 family proteins in the neoadjuvantive treatment of prostate cancer</i> Crystal contestant Author: Klossner, D. P., Clarke, D. M., Baust, J. M., Buskirk, R. V., Gage, A., Baust, J. G. |
| 1:45-2:00 | <i>Cryoinjury augmentation of MCF7 human breast cancers by use of eutectic solidification</i> Author: Han, B., Swanlund, D. J., Bischof, J. C. |
| 2:00-2:15 | <i>Characterization of the use of TNF-α to augment cryoinjury: An in vitro study in the isolated cells of prostate tumors</i> Crystal contestant Author: Iftekhar, M.A., Bischof, J.C. |
| 2:15-2:30 | <i>Enhancement of cryothermic injury to prostate tumors by targeted delivery of TNF-α bound gold nanoparticles</i> Crystal contestant Author: Goel, R., Yao, H., Swanlund, D. J., Ebbini, E., Bischof, J. C. |

Gamete Cryopreservation II

p 53-55

Session Chair(s): Stanley Leibo and Ali Eroglu
 Location: Snowflake 2
 Time: 1:00-2:30 pm

| Time | Abstract title |
|-----------|--|
| 1:00-1:15 | <i>Permeability parameters of mammalian ovarian tissue</i> Author: *Devireddy, R. |
| 1:15-1:30 | <i>The permeability of the bovine mature oocyte to water and propylene glycol</i> Author: Mullen, S., Young, A., Agca, Y., Critser, J. K. |
| 1:30-1:45 | <i>Involvement of aquaporin-3 in the permeation of water and glycerol into mouse morulae</i> Author: Edashige, K., Tanaka, M., Ichimaru, N., Higashino, Y., Sakamoto, M., Yazawa, |

K., Kuwano, T., Yamaji, Y., Valdez, D. M. Jr., Kasai, M.

- 1:45-2:00 *Pregnancy following transfer of vitrified porcine embryos produced in vitro*
Author: Men, H., Agca, Y., Riley, L. K., Rieke, A., Murphy, C. N., Prather, R. S., Critser, J. K.
- 2:00-2:15 *Small amounts of trehalose and dimethylsulfoxide preserve developmental competence of mouse oocytes during freeze-thaw*
Author: *Eroglu, A., Bailey, S.
- 2:15-2:30 *Embryonic development of felid oocytes injected with freeze-dried or air-dried spermatozoa*
Author: Moisan, A. E., Leibo, S. P., Lynn, J. W., Gómez, M. C., Pope, C. E., Dresser, B. L., Godke, R. A.

* Invited speakers

Cryosurgery III

p 57-58

Session Chair(s): Omar Maiwand and Andy Gage
Location: Snowflake 1
Time: 3:00-4:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 3:00-3:20 | <i>The application of low temperature in the treatment of malignant tumours</i> Author: *Maiwand, O. |
| 3:20-3:40 | <i>Temperature mapping and correlation to human pathology in the prostate and variances of temperature patterns in different machines</i> Author: *Larson, T., Mynderse, L. |
| 3:40-4:00 | <i>Multicenter experience with third generation cryosurgery of the prostate: Minimally invasive, safe and effective</i> Author: *Lee, J. |
| 4:00-4:20 | <i>Pathology of cryothermic and hyperthermic therapies: A tale of Twin Cities with overlapping boundaries</i> Author: *Coad, J. |

* Invited speakers

Gamete Cryopreservation III

p 59-60

Session Chair(s): Ken Roberts and Stuart Meyers
Location: Snowflake 2
Time: 3:00-4:30 pm

| <u>Time</u> | <u>Abstract Title</u> |
|-------------|--|
| 3:00-3:20 | <i>Male-to-male differences in susceptibility of spermatozoa to cryopreservation</i> Author: *Leibo, S. P. |
| 3:20-3:40 | <i>Practical issues and challenges of gamete and embryo cryopreservation in the clinical laboratory</i> Author: *De Jonge, C. |
| 3:40-4:00 | <i>Clinical reality of cryopreserving sperm</i> |

Author: *Pryor, J.

4:00-4:20

*Cryoprotectants-free cryopreservation of human spermatozoa by ice-free vitrification:
Direct plunging in LN₂ v.s. fast freezing in vapor*

Author: Katkov, I. I., Isachenko, V., Isachenko, E., van der Ven, H., Montag, M.

* Invited speakers

Tuesday July 26, 2005

Plenary Session:

Molecular and Genetic Adaptations to the Cold

p 61-62

Session Chair(s): Seizo Fujikawa

Location: Snowflake 3

Time: 8:00 –10:00 am

Time Abstract title

8:00-8:40 *How to get away with doing nothing—Prokaryotic survival strategies*

Author: Helm, R., Potts, M.

8:40-9:20 *CryoSEM: Visualization of macromolecules and cell surface adhesion molecules*

Author: Erlandsen, S. L.

9:20-10:00 *Natural freeze tolerance: It's in the genes!*

Author: Storey, K. B.

Drying and Vitrification II

p 63-64

Session Chair(s): Mehmet Toner and Gloria Elliot

Location: Snowflake 1

Time: 10:30 am –12:00 pm

Time Abstract title

10:30-11:00 *From anhydrobiosis to freeze-drying of platelets*

Author: *Wolkers, W.

11:00-11:30 *Kinetic stabilization by DMSO for freeze-drying of human red blood cells*

Author: *Sun, W. Q.

11:30-11:45 *Effects of DMSO in platelet lyophilization*

Crystal Author: Zhou, J., Liu, J., Ouyang, X.

contestant

11:45-12:00 *Drying nucleated cells in monolayers under control humidity improves the cell survival and longevity*

Author: Katkov, I. I., Leon, P., Levine, F.

* Invited speakers

Molecular and Genetic Alteration Symposium

p 65-66

Session Chair(s): Mary Hagedorn and Ken Storey

Location: Snowflake 2

Time: 10:30 am –12:00 pm

Time Abstract title

10:30-11:00 *Natural states of cellular stasis in non-mammalian species: Insights into metabolic arrest and cell stabilization*

Author: *Hand, S.

11:00-11:20 *Physicochemical study on the cryptobiosis in larvae of polypedium vanderplanki*

Author: Sakurai, M., Furuki, T., Akao, K., Kikawada, T., Watanabe, K., Okuda, T.
11:20-11:40 *The search for possible factors that may concern to stabilization of deep supercooling in xylem parenchyma cells of trees*

Author: Fujikawa, S., Kasuga, J., Takata, N., Takahashi, H., Mizuno, K., Arakawa, K.
11:40-12:00 *Genetics of mouse sperm cryopreservation*

Author: Landel, C. P., Li, R., Taft, R. A., Lusic, A. J., Davis, R. C.

* Invited speakers

Cryobiophysics I: Ice Formation

p 67-69

Session Chair(s): Jens Karlsson and Jon Dantzig

Location: Snowflake 1

Time: 1:00-2:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|---|
| 1:00-1:15 | <i>Experimental validation of a continuum model of intercellular ice propagation in 1-dimensional and 2-dimensional tissue constructs</i> Author: Sumpter, M. L., Stott, S. L., Irimia, D., Karlsson, J. O. M. |
| 1:15-1:30 | <i>Interactions of cells with dendritic interfaces</i> Author: Chang, A., Dantzig, J. |
| 1:30-1:45 | <i>Effect of micropattern geometry on the kinetics of intracellular ice formation in co-cultured tissue</i> Author: Stott, S. L., Karlsson, J. O. M. |
| 1:45-2:00 | <i>Two-phase computerized planning of cryosurgery using a bubble-packing technique and force-field analogy</i> Author: Tanaka, D., Shimada, K., Rabin, Y. |
| 2:00-2:15 | <i>Osmotic poration, water permeability and intracellular freezing</i> Author: Muldrew, K., Lockwood, J., Schachar, J., Cheng, P., Poole, B., Wan, R. |
| 2:15-2:30 | <i>Observation of intracellular ice formation in adherent cells at high spatial and temporal resolution</i> Author: Stott, S. L., Karlsson, J. O. M. |

Biomedical Devices and Sensors I

p 71-73

Session Chair(s): Ram Devireddy and Ken Muldrew

Location: Snowflake 2

Time: 1:00-2:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|---|
| 1:00-1:15 | <i>A novel design of cryomicroscope using thermal electric cooling</i> Author: Lin, T. T., Chiang, Y. S., Wu, C. H., Chao, N. H. |
| 1:15-1:30 | <i>The phase transition diagram of water in the membrane diamond anvil cell isochoric pressure vessel</i> Author: Preciado, J., Rubinsky, B. |
| 1:30-1:45 | <i>Controlled temperature environments for maintenance and shipment of vitrified tissue</i> Author: Wowk, B. |

- 1:45-2:00 *Development of an automated machine for removing CPAs from cryopreserved cells*
 Author: Yu, J., Luo, D., Woods, E., Gao, D.
- 2:00-2:15 *Ice nucleus formation on demand and its benefit for freeze applications*
 Crystal
 contestant Author: Petersen, A., Schneider, H., Rau, G., Glasmacher, B.

Cryobiophysics II: CPA Loading and Water Transport

p 75-77

Session Chair(s): Igor Katkov and Fritz Kleinhans
 Location: Snowflake 1
 Time: 3:00-4:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|------------------------------------|---|
| 3:00-3:15 | <i>Water transport revisited: Effect of intracellular diffusion on the kinetics of cell dehydration during freezing</i> Author: Carnevale, K. A., Karlsson, J. O. M. |
| 3:15-3:30 | <i>Exact solution for the time of maximum volume excursion (2- solute systems)</i> Author: Katkov, I. I. |
| 3:30-3:45 Crystal contestant | <i>Theoretical optimization of CPA addition and removal strategies</i> Author: Benson, J. D., Chicone, C. C., Critser, J. K. |
| 3:45-4:00 Crystal contestant | <i>A new look at an old topic: Osmotic transport across cell membranes</i> Author: Elmoazzen, H., Elliott, J. A. W., Mcgann, L. E. |
| 4:00-4:15 Crystal contestant | <i>Solution properties of the cytoplasm for simulations of cryopreservation protocols</i> Author: Ross-Rodriguez, L.U., Ng-Muk-Yuen, J., Elliot, J. A. W., Mcgann, L. E. |
| 4:15-4:30 Crystal contestant | <i>A multi-solute osmotic virial equation for solutions of interest in cryobiology</i> Author: Bannerman, R. C., Elliott, J. A. W., Porter, K. R., Mcgann, L. E. |

Devices and Sensors II

p 79-82

Session Chair(s): Hiroshi Takamatsu and David Rawson
 Location: Snowflake 2
 Time: 3:00-4:30 pm

| <u>Time</u> | <u>Abstract Title</u> |
|------------------------------------|--|
| 3:00-3:15 Crystal contestant | <i>In vitro characterization of movement, heating and visualization of magnetic nano- and microparticles for biomedical applications</i> Author: Kalambur, V., Han, B., Hammer, B., Shield, T., Bischof, J. |
| 3:15-3:30 Crystal contestant | <i>Optimization of microwave rewarming of cryopreserved materials: Experiments and numerical simulation</i> Author: Han, X., Luo, D., Yu, C., Lu, C., Gao, D. |
| 3:30-3:45 | <i>Electromagnetic rewarming of cryopreserved biomaterials using a single mode rectangular resonant cavity</i> |

Author: Luo, D., Yu, C., Lu, C., Gao, D.

3:45-4:00 *Temperature dependent dielectric properties of CPA solutions: Cavity perturbation method*

Author: Luo, D., Yu, C., Han, X., Lu, C., Gao, D.

4:00-4:15. *Mercury Biosensors: Spatial expression of mercury-induced green fluorescent protein or luciferase in Escherichia coli immobilized in latex biocatalytic coatings*

Author: Schottel, J., Anderson, C., Flickinger, M.

4:15-4:30 *Cell based biosensors for environmental monitoring: Challenges in exploiting cell bioassays in disposable sensor configurations*

Author: *Rawson, D., Zhang, T., Wex, H., Bhatia, R.

* Invited Speakers

Poster Session II:

Tuesday July 26, 2005

Location: Snowflake 3

Time: 5:00-7:00 pm

Δ = Poster award contestants

| Topic: Preservation of Non-Mammalian Species | | p 83-85 |
|---|---|----------------|
| 34. | <i>Microinjection of cryoprotectants into seabream embryos</i> | |
| Δ | Author: Beirão, J., Cabrita, E., Robles, V., Sarasquete, M. C., Herráez, M. P. | |
| 35. | <i>The application of sperm cryopreservation in selective breeding of the Pacific oyster (Crassostrea gigas)</i> | |
| | Author: Roberts, R. D., Smith, J. F., Adams, S. L., Janke, A. R., King, N. G., Kaspar, H. F., Tervit, H. R., Webb, S. C. | |
| 36. | <i>Coral sperm cryopreservation</i> | |
| | Author: Hagedorn, M., Lang, R. P. | |
| 37. | <i>Preliminary study of the vitrification for Red Sea bream (pagrus major) embryos</i> | |
| | Author: Ding, F. H., Li, J., Xiao, Z. Z. | |
| 38. | <i>Studies on the effect of certain supplements in cryoprotective medium on zebrafish (Danio rerio) oocytes quality after controlled slow cooling</i> | |
| Δ | Author: Plachinta, M., Zhang, T., Rawson, D. M. | |
| Topic: Hypothermic Storage | | p 85-86 |
| 39. | <i>Hypothermic storage of human articular cartilage</i> | |
| | Author: Muldrew, K., Schachar, N., Hunter, S. | |
| 40. | <i>Ontogenic peculiarities of antioxidant system in the cold tolerant beetle tenebrio molitor</i> | |
| | Author: Gulevsky, A. K., Relina, L. I., Grishchenkova, Y. A., Kareva, L. V. | |
| Topic: Molecular/ Genetic Adaptation to Cold | | p 86-92 |
| 41. | <i>Cellular proteomic alterations following cryopreservation influence cell survival</i> | |
| | Author: Baust, J. M., Kulkarni, H., Vogel, M. J., Van Buskirk, R. G., Baust J. G. | |
| 42. | <i>Differential gene expression in Mexican fruit flies after cryopreservation</i> | |
| | Author: Rajamohan, A., Yocum, G. D., Leopold, R. A. | |

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|---|---|
| 43. | <i>Refrigerated storage of glassy-winged sharpshooter eggs for use in the propagation of parasitoids</i> Author: Chen, W., Harris, M., Leopold, R. A. |
| 44. Δ | <i>Temperature-induced conformational behavior of fish antifreeze glycoprotein (AFGP) and type-I antifreeze protein (AFPI) solutions, studied by Raman Spectroscopy</i> Author: Liceaga-Gesualdo, A., Li-Chan, E. |
| 45. Δ | <i>Anti-ice-nucleation substances in xylem parenchyma cells of boreal hardwood species that exhibit deep supercooling</i> Author: Kasuga, J., Mizuno, K., Arakawa, K., Fujikawa, S. |
| 46. | <i>Cloning and expression of hypoxia-inducible factor 1 from the hibernating ground squirrel, <i>Spermophilus tridecemlineatus</i></i> Author: Morin, P. Jr., Storey, K. B. |
| 47. | <i>Protein expression level of heat shock proteins in a cold-hardy insect, <i>Epiblema scudderiana</i></i> Author: Zhang, G. J., Storey, K. B. |
| 48. | <i>Regulation of adenosine monophosphate deaminase in the freeze tolerant wood frog, <i>Rana sylvatica</i></i> Author: Dieni, C. A., Storey, K. B. |
| 49. | <i>Expression of the activating transcription factor, ATF4, and its downstream genes in hibernating ground squirrels</i> Author: Hapsatou, M., Storey, K. B. |
| 50. | <i>Levels of phosphorylated signal transducers and activators of transcription in hibernating mammals</i> Author: Tye, J., Storey, K. B. |
| 51. | <i>Creatine kinase regulation during hibernation in Richardson's ground squirrels</i> Author: Abnous, K., Storey, K. B. |
| 52. | <i>Glutathione S-transferase and antioxidant defense in freeze tolerant wood frogs</i> Author: Du, J., Storey, K. B. |
| Topic: Plant Cryobiology p 92-94 | |
| 53. | <i>Assessment of desiccation sensitivity of tea embryos for cryopreservation</i> Author: Haeng-Hoon, K., Yoon, J. W., Kim, J. H., Choi, Y. M., Cho, E. G, Kim, T. S. |
| 54. | <i>Cryopreservation of marine micro-algae</i> Author: Rhodes, L., Smith, J. F., Tervit, H. R., Adamson, J., Roberts, R. D., Adams, S. L. |
| 55. Δ | <i>Ultrastructural evidence for the effects of rapid cooling on meristematic cells of monocotyledonous plant by the encapsulation-vitrification protocol using cryo-scanning electron microscopy</i> Author: Tanaka, D., Niino, T., Uemura, M., Fujikawa, S. |
| 56. Δ | <i>Mechanism of intercellular ice propagation in plant tissues: Experiments and theoretic analysis</i> Author: Han, X., Cui, X., Gao, D. |
| 57. Δ | <i>Design of an ultrasound sensor to measure moisture loss during drying</i> Author: Mittal, S., Devireddy, R. |
| Topic: Biosensors and Medical Devices p 95 | |
| 58. Δ | <i>Characterisation and first experimental application of a new freezing device for cryopreservation of human cells under controlled ice nucleus formation</i> |

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|---|--|
| | Author: Schneider, H., Petersen, A., Rau, G., Glasmacher, B. |
| 59. | <i>Diffusion based extraction of DMSO from post thaw cell suspension</i> |
| Δ | Author: Fleming, K., Hubel, A., Barocas, V., Longmire, E. |
| Topic: Thermal/Chemical/Biophysical Properties | |
| | p 96-98 |
| 60. | <i>Predictions of cracking during vitrification of cryoprotectants</i> |
| Δ | Author: Palastro, M., Steif, P. S., Rabin, Y. |
| 61. | <i>Cell viability and kinetic model for prediction of it under exposure to hypertonic NaCl solution at near-zero temperature</i> |
| Δ | Author: Ishiguro, H., Fukuda, K. |
| 62. | <i>Effects of glycerol on thermal properties of phosphate buffered saline at subzero temperatures</i> |
| Δ | Author: Choi, J. H., Han, B., Bischof, J. C. |
| 63. | <i>Quantification of tissue dehydration by measurement of fluorescence quenching</i> |
| Δ | Author: Higgins, A., Karlsson, J. |
| Topic: Mathematical Models of Preservation Processes | |
| | p 98 |
| 64. | <i>Effect of DMSO on POPC and DMPC lipid bilayers: An atomistic investigation</i> |
| Δ | Author: Pinisetty, D., Moldovan, D., Devireddy, R. |

Wednesday July 27, 2005

Plenary Session:

Cryobiology in Wildlife Ecology and Conservation

p 101-102

Session Chair(s): David Wildt

Location: Snowflake 3

Time: 8:00 –10:00 am

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 8:00-8:40 | <i>Challenges in cryopreserving endangered mammal spermatozoa: the value of acrosomal integrity</i> Author: Pukazhenthil, B., Howard, J., Aitken-Palmer, C., Crosier, A., Santymire, R., Wildt, D. |
| 8:40-9:20 | <i>Skeletal muscle protein and strength retention by hibernators: Taking physiology to the field</i> Author: Harlow, H. |
| 9:20-10:00 | <i>Coral conservation and cryopreservation</i> Author: Hagedorn, M., Pan, R., Cox, E. F., Hollingsworth, L., Krupp, D., Lewis, T. D., Leong, J. C., Mazur, P., Rall, W. F., MacFarlane, D. R., Fahy, G., Kleinhans, F. W. |

Non-Mammalian Cryobiology I

p 103-104

Session Chair(s): Tiantian Zhang and Steve Hand

Location: Snowflake 1

Time: 10:30 am –12:00 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 10:30-10:50 | <i>Cryopreservation of oocytes from a marine fish: Achievements and obstacles</i> Author: *Lubzens, E., Pekarsky, I., Blais, I., Cionna, C., Carnevali, O. |
| 10:50-11:10 | <i>Assay of different methods to increase cryoprotection in zebrafish embryos</i> Author: Robles, V., Martinez-Prado, S., Cancela, L., Paz Herráez, M. |
| 11:10-11:30 | <i>Membrane integrity and cathepsin activities of zebrafish (<i>Danio rerio</i>) oocytes after freezing to -196°C using controlled slow cooling</i> Author: *Zhang, T., Plachinta, M., Kopeika, J., Rawson, D. M., Cionna, C., Tosti, L., Carnevali, O. |
| 11:30-11:50 | <i>Water-and cryoprotectant-permeability of zebrafish oocytes and its artificial enhancement</i> Author: Seki, S., Kouya, T., Valdez D. M. Jr., Hara, T., Kasai, M., Edashige, K. |

* Invited speakers

Chemical Permeation and Injury

p 105-107

Session Chair(s): Jason Acker and Hiroshi Ishiguro

Location: Snowflake 2

Time: 10:30 am –12:00 pm

| <u>Time</u> | <u>Abstract title</u> |
|--------------------------------------|--|
| 10:30-10:45 Crystal contestant | <i>Cell nanosurgery and reversible membrane permeabilization using high-intensity femtosecond laser pulses</i> Author: Kohli, V., Acker, J. P., Elezzabi, A. Y. |
| 10:45-11:00 | <i>Characterization of a novel permeabilization technique for the intracellular delivery of cryoprotective sugars</i> Author: Lecak, J., Scott, K., Gyongyossy-Issa, M. I. C., Acker, J. P. |
| 11:00-11:15 Crystal contestant | <i>Liposomal delivery of cryoprotective intracellular disaccharides into human red blood cells</i> Author: Lecak, J., Gyongyossy-Issa, M. I. C., Acker, J. P. |
| 11:15-11:30 | <i>A new approach for cell cryopreservation: antifreeze-proteins internalization into mammalian cells by means of a cell-penetrating porter</i> Author: Vargas, J., Fernández-Chacón, R., Risco, R. |
| 11:30-11:45 Crystal contestant | <i>Contribution of the solution effect to the cryoinjury of PC-3 cells</i> Author: Zawlodzka, S., Miyanaga, T., Takamatsu, H. |

Non-Mammalian Cryobiology II

p 109-110

Session Chair(s): Esther Lubzens and Vanessa Robles
Location: Snowflake 1
Time: 1:00-2:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|-------------|--|
| 1:00-1:20 | <i>Attempted artificial insemination using cryopreserved sperm of live-bearing fishes (genus Xiphophorus)</i> Author: Dong, Q., Huang, C., Hazlewood, L., Walter, R., Tiersch, T. |
| 1:20-1:40 | <i>Comparative studies of sperm cryopreservation of diploid and tetraploid Pacific oysters</i> Author: Dong, Q., Huang, C., Eudeline, B., Allen, S. Jr., Tiersch, T. |
| 1:40-2:00 | <i>Current research on the cryopreservation of honey bee, Apis mellifera L., semen</i> Author: Collins, A. M. |
| 2:00-2:20 | <i>High fertility with frozen-thawed fowl semen after optimization of cooling rate X CPA concentration</i> Author: Woelders, H., Zuidberg, C., Hiemstra, S. |

Biomechanical Effects of Freezing

p 111-112

Session Chair(s): Yoed Rabin
Location: Snowflake 2
Time: 1:00-2:30 pm

| <u>Time</u> | <u>Abstract title</u> |
|------------------------------------|--|
| 1:00-1:20 Crystal contestant | <i>The effects of freezing on the biomechanics of arteries</i> Author: Venkatasubramanian, R. T., Grassl, E. D., Bischof, J. C. |

- 1:20-1:40 *Analysis of thermal stress in cryosurgery of kidneys*
Author: He, X., Bischof, J. C.
- 1:40-2:00 *Cryomacroscopy: Vitrification and fracture formation*
Author: Rabin, Y., Taylor, M. J., Walsh, J. R., Baicu, S., Wan, C. R., Steif, P. S.
- 2:00-2:20 *Thermal expansion of blood vessels in the presence of cryoprotectants: A new device and experimental results*
Crystal
contestant Author: Jimenez, J., Rabin, Y.

Non-Mammalian Cryobiology III

p 113-115

Session Chair(s): Mary Hagedorn and Keisuke Edashige

Location: Snowflake 1

Time: 3:00-4:30 pm

| Time | Abstract title |
|-----------|---|
| 3:00-3:15 | <i>Successful cryopreservation of Pacific oyster (Crassostrea gigas) oocytes</i> Author: Tervit, H. R., Adams, S. L., Roberts, R. D., McGowan, L., Pugh, P. A., Smith, J. F., Janke, A. R. |
| 3:15-3:30 | <i>Marine oocyte cryopreservation - Starfish experience</i> Author: Eroglu, A., Hamaratoglu, F., Koseoglu, M., Toner, M., Sadler, K. C. |
| 3:30-3:45 | <i>Intraembryonic ice formation behavior of zebrafish (Danio rerio) embryos</i> Author: *Lin, T. T., Wu, C. H., Chao, N. H. |
| 3:45-4:00 | <i>Analysis of intracellular ice nucleation in early stage xenopus oocytes by differential scanning calorimetry</i> Author: Kleinhans, F. W., Guenther, J. F., Roberts, D. M., Mazur, P. |
| 4:00-4:15 | <i>Water P_f of xenopus (AQP1 \pm) stage I and II oocytes</i> Author: Kleinhans, F. W., Guenther, J. F., Seki, S., Edashige, K., Roberts, D. M., Mazur, P. |
| 4:15-4:30 | <i>A study of extra-and intracellular ice formation in Xenopus eggs by cryomicroscopy</i> Author: Guenther, J., Roberts, D., Mazur, P. |

* Invited speakers

Drying and Vitrification III

p 117-118

Session Chair(s): Wendell Sun and Wim Wolkers

Location: Snowflake 2

Time: 3:00-4:00 pm

| Time | Abstract title |
|-----------|---|
| 3:00-3:20 | <i>Studies of the thermophysical properties of trehalose-salt mixture and trehalose-biologics interaction</i> Author: Sitaula, R., Bhowmick, S. |
| 3:20-3:40 | <i>Permeabilization of mitochondria in situ</i> Author: Liu, X. H., Toner, M., Menze, M. A., Hand, S. C. |
| 3:40-4:00 | <i>Mouse sperm desiccated and stored in trehalose medium without freezing</i> Author: McGinnis, L., Zhu, L., Lawitts, J., Bhowmick, S., Toner, M., Biggers, J. |

Crystal Award Presentations:

Sunday July 24, 2005

Session: Cell and Tissue Preservation I

Location: Snowflake 1

1:15-1:30 *Cryopreservation of cell seeded 3D collagen scaffolds*
Author: Kuberka, M., Müller-Meskamp, S., Rau, G., Glasmacher, B.

Session: Cell and Tissue Preservation II

Location: Snowflake 1

3:45-4:00 *Improved energy recovery of warm ischemic livers during hypothermic machine perfusion with anaplerotic substrates*
Author: Jain, S., Lee, S. H., Berthiaume, F., Zhang, J. X., Clemens, M. G., Lee, C. Y.

4:00-4:15 *Effect of gaseous condition during extended hypothermic machine perfusion preservation on liver function*
Author: Joneja, J. S., Wang, L., Zhang, J. X., Clemens, M. G., Lee, C. Y.

Monday July 25, 2005

Session: Gamete Cryopreservation I

Location: Snowflake 2

11:30-11:45 *Effect of seminal plasma proteins on capacitative changes in cooled and frozen porcine sperm*
Author: Vadnais, M., Roberts, K.

Session: Cryosurgery II

Location: Snowflake 1

1:30-1:45 *Utilization of Bcl-2 family proteins in the neoadjuvant treatment of prostate cancer*
Author: Klossner, D. P., Clarke, D. M., Baust, J. M., Buskirk, R. V., Gage, A., Baust, J. G.

2:00-2:15 *Characterization of the use of TNF- α to augment cryoinjury: An in vitro study in the isolated cells of prostate tumors*
Author: Iftekhar, M. A., Bischof, J. C.

2:15-2:30 *Enhancement of cryothermic injury to prostate tumors by targeted delivery of TNF- α bound gold nanoparticles*
Author: Goel, R., Yao, H., Swanlund, D. J., Ebbini, E., Bischof, J. C.

Tuesday July 26, 2005

Session: Drying and Vitrification II

Location: Snowflake 1

11:30-11:45 *Effects of DMSO in platelet lyophilization*
Author: Zhou, J., Liu, J., Ouyang, X.

Session: Cryobiophysics: Ice Formation

Location: Snowflake 1

- 1:45-2:00 *Two-phase computerized planning of cryosurgery using a bubble-packing technique and force-field analogy*
Author: Tanaka, D., Shimada, K., Rabin, Y.
- 2:15-2:30 *Observation of intracellular ice formation in adherent cells at high spatial and temporal resolution*
Author: Stott, S., Karlsson, J. O. M.

Session: Biomedical Devices and Sensors I

Location: Snowflake 2

- 1:15-1:30 *The phase transition diagram of water in the membrane diamond anvil cell isochoric pressure vessel*
Author: Preciado, J., Rubinsky, B.
- 2:00-2:15 *Ice nucleus formation on demand and its benefit for freeze applications*
Author: Petersen, A., Schneider, H., Rau, G., Glasmacher, B.

Session: Cryobiophysics II: CPA Loading and Water Transport

Location: Snowflake 1

- 3:30-3:45 *Theoretical optimization of CPA addition and removal strategies*
Author: Benson, J. D., Chicone, C. C., Critser, J. K.
- 3:45-4:00 *A new look at an old topic: Osmotic transport across cell membranes*
Author: Elmoazzen, H., Elliott, J. A. W., Mcgann, L. E.
- 4:00-4:15 *Solution properties of the cytoplasm for simulations of cryopreservation protocols*
Author: Ross-Rodriguez, L.U., Ng-Muk-Yuen, J., Elliot, J. A. W., Mcgann, L. E.
- 4:15-4:30 *A multi-solute osmotic virial equation for solutions of interest in cryobiology*
Author: Bannerman, R. C., Elliott, J. A. W., Porter, K. R., Mcgann, L. E.

Session: Devices and Sensors II

Location: Snowflake 2

- 3:00-3:15 *In vitro characterization of movement, heating and visualization of magnetic nano- and microparticles for biomedical applications*
Author: Kalambur, V., Han, B., Hammer, B., Shield, T., Bischof, J.
- 3:15-3:30 *Optimization of microwave rewarming of cryopreserved materials: Experiments and numerical simulation*
Author: Han, X., Luo, D., Yu, C., Lu, C., Gao, D.

Wednesday July 27, 2005

Session: Non-Mammalian Cryobiology I

Location: Snowflake 1

- 10:50-11:10 *Assay of different methods to increase cryoprotection in zebrafish embryos*
Author: Robles, V., Martinez-Pramo, S., Cancela, L., Paz Herráez, M.

Session: Chemical Permeation and Injury

Location: Snowflake 2

10:30-10:45 *Cell nanosurgery and reversible membrane permeabilization using high-intensity femtosecond laser pulses*

Author: Kohli, V., Acker, J. P., Elezzabi, A. Y.

11:00-11:15 *Liposomal delivery of cryoprotective intracellular disaccharides into human red blood cells*

Author: Lecak, J., Gyongyossy-Issa, M. I. C., Acker, J. P.

11:30-11:45 *Contribution of the solution effect to the cryoinjury of PC-3 cells*

Author: Zawlodzka, S., Miyana, T., Takamatsu, H.

Session: Biomechanical Effects of Freezing

Location: Snowflake 2

1:00-1:20 *The effects of freezing on the biomechanics of arteries*

Author: Venkatasubramanian, R. T., Grassl, E. D., Bischof, J. C.

2:00-2:20 *Thermal expansion of blood vessels in the presence of cryoprotectants: A new device and experimental results*

Author: Jimenez, J., Rabin, Y.

Poster Award Presentations:

(All posters located in Snowflake 3 from 5:00-7:00.)

Sunday July 24, 2005

Topic: Stem Cell Preservation

1. *Laser assisted freezing of cell suspensions*

Author: Huckaby, K., Kandra, D., Devireddy, R. V.

4. *Freezing storage of adult stem cells*

Author: Thirumala, S., Gimble, J. M., Devireddy, R.

5. *Liposomal delivery of intracellular disaccharides for applications in stem cell biopreservation*

Author: Scott, K., Gyongyossy-Issa, M., Acker, J.

Topic: Cryosurgery

6. *An efficient numerical technique for computerized planning of cryosurgery*

Author: Rossi, M., Rabin, Y.

8. *Cellular level effects of freezing smooth muscle cells: Application in cryoplasty and cryopreservation*

Author: Balasubramanian, S. K., Hubel, A., Bischof, J. C.

Topic: Cell and Tissue Preservation

11. *Influence of directional solidification on the post-thaw vitality of corneal layers*

Author: Janke, A., Salla, S., Walter, P., Rau, G., Glasmacher, B.

12. *Cryopreservation of human adipocytes*

Author: Gempt, J., Petersen, A., Wolters, T., Pallua, N., Glasmacher, B.

13. *Factors affecting the success of cryosurgery: An in vitro study of LNCaP and PC-3 cell lines*
Author: Klossner, D. P., Clarke, D. M., Baust, J. M., Buskirk, R. V., Gage, A., Baust, J. G.
15. *Cryopreservation of human fibroblasts and epithelial cells: Comparison of different freezing methods*
Author: Bernemann, I., Kuberka, M., Petersen, A., Rau, G., Glasmacher, B.
19. *Measurement of the kinetics of intercellular ice propagation in endothelial cells using micropatterned tissue constructs*
Author: Stott, S. L., Karlsson, J. O. M.

Topic: Drying and Vitrification

27. *Drying storage of adipose tissue derived adult stem cells*
Author: Mittal, S., Pinisetty, D., Devireddy, R.
29. *Quantitative study on the effects of sugars on membrane phase transitions*
Author: Lenné, T., Bryant, G., Koster, K. L.
31. *Resistance of freeze-dried human acellular matrix to gamma irradiation: Changes of biomechanical property and cellular interaction*
Author: Gouk, S. S., Lim, T. M., Teoh, S. H., Sun, W. Q.

Tuesday July 26, 2005

Topic: Preservation of Non-Mammalian Species

34. *Microinjection of cryoprotectants into seabream embryos*
Author: Beriao, J., Cabrita, E., Robles, V., Sarasquete, M. C., Herráez, M. P.
38. *Studies on the effect of certain supplements in cryoprotective medium on zebrafish (*Danio rerio*) oocytes quality after controlled slow cooling*
Author: Plachinta, M., Zhang, T., Rawson, D. M.

Topic: Molecular/Genetic Adaptation to Cold

44. *Temperature-induced conformational behavior of fish antifreeze glycoprotein (AFGP) and type-I antifreeze protein (AFPI) solutions, studied by Raman Spectroscopy*
Author: Liceaga-Gesualdo, A., Li-Chan, E.
45. *Anti-ice-nucleation substances in xylem parenchyma cells of boreal hardwood species that exhibit deep supercooling*
Author: Kasuga, J., Mizuno, K., Arakawa, K., Fujikawa, S.

Topic: Plant Cryobiology

55. *Ultrastructural evidence for the effects of rapid cooling on meristematic cells of monocotyledonous plant by the encapsulation-vitrification protocol using cryo-scanning electron microscopy*
Author: Tanaka, D., Niino, T., Uemura, M., Fujikawa, S.
56. *Mechanism of intercellular ice propagation in plant tissues: Experiments and theoretic analysis*
Author: Han, X., Cui, X., Gao, D.
57. *Design of an ultrasound sensor to measure moisture loss during drying*
Author: Mittal, S., Devireddy, R.

Topic: Biosensors and Medical Devices

58. *Characterisation and first experimental application of a new freezing device for cryopreservation*

of human cells under controlled ice nucleus formation

Author: Schneider, H., Petersen, A., Rau, G., Glasmacher, B.

59. *Diffusion based extraction of DMSO from post thaw cell suspension*

Author: Fleming, K., Hubel, A., Barocas, V., Longmire, E.

Topic: Thermal/Chemical/Biophysical Properties

60. *Predictions of cracking during vitrification of cryoprotectants*

Author: Palastro, M., Steif, P. S., Rabin, Y.

61. *Cell viability and kinetic model for prediction of it under exposure to hypertonic NaCl solution at near-zero temperature*

Author: Ishiguro, H., Fukuda, K.

62. *Effects of glycerol on thermal properties of phosphate buffered saline at subzero temperatures*

Author: Choi, J. H., Han, B., Bischof, J. C.

63. *Quantification of tissue dehydration by measurement of fluorescence quenching*

Author: Higgins, A., Karlsson, J.

Topic: Mathematical Models of Preservation Processes

64. *Effect of DMSO on POPC and DMPC lipid bilayers: An atomistic investigation*

Author: Pinisetty, D., Moldovan, D., Devireddy, R.