



**US-Japan
Cooperative
Cataract
Research Group
Meeting**

December 6-10, 2009
Kailua-Kona, Hawaii

Organizing Committee

**Yoshio Akagi
Fukui, Japan**

**Nobuhiro Ibaraki
Tochigi, Japan**

**Hiroshi Sasaki
Kanazawa, Japan**

**Hiroyoki Matsushima
Tochigi, Japan**

**Makoto Takehana
Tokyo, Japan**

**Frank Giblin
Oakland, Michigan, USA**

**Peter F. Kador
Omaha, Nebraska, USA**

Program & Abstracts

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Acknowledgements

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Nakamura Hospital, Echizen, Japan

Maizuru Kyosai Hospital, Kyoto, Japan,

Hayashi Hospital, Echizen, Japan

Tomiki Medical Instruments Co.,Ltd, Kanazawa, Japan

Rakuwakai Health Care System, Kyoto, Japan

ImadateCyuou Hospital, Echizen, Japan

Senju Pharmaceutical Co.,Ltd, Osaka, Japan

Fukui Aiiiku Hospital, Fukui, Japan

Fukui Cardiovascular Center, Fukui, Japan

Fukui Social Insurance Hospital, Katsuyama, Japan

Hirose Hospital, Sabae, Japan

Harue hospital, Sakai, Japan

Fukui General Hospital, Fukui, Japan

Santen Pharmaceutical Co.,Ltd, Osaka, Japan

Alcon Japan Ltd., Tokyo, Japan

National Foundation for Eye Research,
Rochester, MI, USA

**National Foundation for Eye Research
Awards**

Kinoshita Lectureship

Majorie F. Lou, Ph.D.
University of Nebraska-Lincoln
Lincoln, Nebraska, USA

Henry Fukui Travel Award

Jayante Pande, Ph.D.
State University of New York at Albany
Albany, New York, USA

Frederick Bettelheim Travel Award

Ameet Chimote, Ph.D.
University of California at San Francisco
San Francisco, California, USA

W. Gerald Robison Travel Award

Gitanjali Sehwat, Ph.D.
Johns Hopkins University School of Medicine
Baltimore, Maryland, USA

Alvira Reddy Travel Award

Hiroyuki Matsushima, MD, PhD
Dokkyo Medical University
Tochigi, Japan

Young Investigator Travel Awards

Nicholas Fain, B.S.
University of California at Los Angeles
Los Angeles, California, USA

Lili Gong, M.Sc.
University of Nebraska Medical Center
Omaha, Nebraska, USA

Program

All Sessions held in Kakalu'u 1 & 2

Sunday, December 6

5:00 PM Registration

7:00 PM Welcome Reception at Kuakini Lawn

Monday, December 7

8:20 AM Welcome Y. Akagi and P.F. Kador

8:30 AM Session 1 SECONDARY CATARACT DEVELOPMENT

Moderators: N. Ibaraki and H. Matsushima

1. *IMPORTANCE OF ADHESION BETWEEN IOL (INTRAOCULAR LENS) AND LENS CAPSULE FOR PREVENTION OF SECONDARY CATARACT.* **H. Matsushima**, K. Mukai, T. Senoo
2. *VERTICAL CULTURE OF HUMAN LENS EPITHELIAL CELLS.* **N. Ibaraki**
3. *CHANGES IN LENS EPITHELIAL CELLS (LECS) BY EXCHANGING VITREOUS TO DIFFERENT INTRAOCULAR TAMPONADE USING EXPERIMENTAL MODEL.* **N. Gotoh**, H. Matsushima, K. Mukai, T. Senoo
4. *RESTORATION OF ACCOMMODATION BY LENS REFILLING AND PCO: CURRENT STATUS.* **J.-M. Parel**, E. Arrieta, S. Yoo, Y. Takesue, M. Taneja, P. Milne, T. Hughes, R. Augusteyn, B. Holden
5. *EVALUATION OF TRANSPARENCY OF DIFFERENT TYPES OF HYDROPHOBIC ACRYLIC IOLS AFTER IMPLANTATION.* **M. Nagata**, H. Matsushima, W. Terauchi, T. Senoo

10:10 AM Coffee Break

**10:30 AM Session 2 CLINICAL CATARACT
DEVELOPMENT**

Moderators: H. Sasaki and L.T. Chylack

1. *HEAT CATARACT BY MILLIMETER WAVE BAND EXPOSURE AND THERMAL TRANSPORT OF AQUEOUS HUMOR.* **M. Kojima**, Y. Yamashiro, T. Sakai, Y. Suzuki, K. Sasaki, H. Sasaki
2. *THE EFFECTS OF IONIZATION RADIATION EXPOSURE ON CRYSTALLINE LENSES OF INTERVENTIONAL RADIOLOGIST.* **H. Sasaki**¹, T. Abe, S. Furu⁴, Y. Sakamoto, S. Suzuki, H. Koutake, K. Terasaki, T. Ishitake, N. Hayabuchi
3. *THE NASCA STUDY: FIVE-YEAR LONGITUDINAL ANALYSIS AND RESULTS.* **L.T. Chylack, Jr.**, A.H. Feiveson, L.E. Peterson, M.L. Wear, L.J. Marak, W.H. Tung, R.R. Gibson, J. Choi, F.A. Cucinotta
4. *LENS THICKNESS BY THREE MAIN TYPES OF CATARACT —REYKJAVIK EYE STUDY:2008 —.* **K. Nagai**, H. Sasaki, R. Honda, M. Kojima, K. Sasaki, F. Jonasson, M. Ono
5. *TOPICAL KINOSTAT™ AMELIORATES THE DEVELOPMENT AND PROGRESSION OF CATARACTS IN DOGS WITH DIABETES* **M. Wyman**, T. Webb, D. Brass, K. Ketring, P.F. Kador
6. *EPITHELIAL CELL DENSITY IN CATARACTOUS LENSES OF PATIENTS WITH DIABETES: ASSOCIATION WITH THE LEVEL OF ERYTHROCYTE ALDOSE REDUCTASE.* **T. Matsumura**, Y. Kumamoto, Y. Takamura, E. Kubo, Y. Akagi

12:30 PM Lunch at Kamia'aina Terrace

6 US - Japan Cooperative Cataract Research Group

1:30 PM Session 3 ANIMAL MODELS

Moderators: X. Gong and E. Kubo

- 1.. *AGE-RELATED CATARACTS AND PRDX 6: CORRELATION BETWEEN SEVERITY OF LENS OPACITY, AGE, AND THE LEVEL OF PRDX EXPRESSION.* **N. Hasanova**, E. Kubo, Y. Kumamoto, Y. Takamura, Y. Akagi
2. *EPH/EHRIN SIGNALING IN AGE-RELATED CORTICAL CATARACT FORMATION.* **X. Gong**, C. Cheng
3. *MICRORNA EXPRESSION PROFILE IN THE DEVELOPING, MATURE AND CATARACTOUS RAT LENS.* **E. Kubo**, N. Hasanova, Y. Takamura, D. P. Singh, Y. Akagi
4. *ANIMAL MODELS FOR STUDYING UVA- AND UVB-INDUCED CATARACTS IN VIVO.* **F.J. Giblin**, M.F. Simpanya, R.R. Ansari, V.R. Leverenz, L.R. Lin
5. *LENS ABNORMALITIES IN ALDO-KETO REDUCTASE TRANSGENIC MICE.* **J.M. Petrash**, S. Palla, A. Pal, P. Ruzycski, G. Zablocki, G.B. Redd
6. *THE ASSOCIATION BETWEEN THE PROGRESSION OF RAT SUGAR CATARACT AND THE LEVELS OF ALDOSE REDUCTASE IN LENS EPITHELIUM.* **Y. Takamura**, T. Tomomatsu, T. Matsu-mura, E. Kubo, Y. Akagi

3:20 PM Coffee Break

3:30 PM Session 4 OXIDATIVE STRESS AND ANTI-CATARACT AGENTS

Moderators: H. Yan and K. Xing

1. *THE ROLE OF GLUTATHIONYLATION IN ACTIN REORGANIZATION IN PROLIFERATING HUMAN LENS EPITHELIAL CELLS.* **K. Xing**, M.F. Lou
2. *ORALLY ACTIVE MULTI-FUNCTIONAL ANTIOXIDANTS TO TREAT AGE-RELATED CATARACTS AND AMD.* **P.F. Kador**¹, J. Randazzo, P. Zhang, H. Kawada, K. Blessing

US - Japan Cooperative Cataract Research Group 7

3. *INHIBITION OF GLUCOCORTICOID-INDUCED CHANGES OF NA⁺,K⁺-ATPASE AND VIMENTIN BY ANTIGLUCOCORTICOID RU486 IN THE ORGAN-CULTURED RAT LENS.* **H. Yan**, G. Xie.
4. *EFFECTS OF ILKSIRNA ON HIGH-GLUCOSE-INDUCED PROLIFERATION AND EPITHELIAL TO MESENCHYMAL TRANSITION IN HUMAN LECS.* **J. Zhou**, Z. Chu, Y. Hui
5. *ANTICATARACT EFFECT AS A PREDICTOR OF DRUG EFFICACY AGAINST EARLY DIABETES-INDUCED RETINAL CHANGES.* **I.G. Obrosova**, V.R. Drel, P.F. Kador, A.B. El-Remessy

7:00 PM Luau at Kuakini Lawn

Tuesday, December 8

8:30 AM Session 5 LENS STRUCTURE AND FUNCTION

Moderators: K. Lo and S. Bassnett

1. *GAP JUNCTIONS ARE SELECTIVELY ASSOCIATED WITH INTERLOCKING BALL-AND-SOCKET DOMAINS BUT NOT PROTRUSIONS IN THE LENS.* **W. Lo**, S.K. Biswas, J.E. Lee
2. *CHANGES IN RABBIT AND COW LENS SHAPE AND VOLUME IN ANISOTONIC CONDITIONS.* **O.A. Candia**, R. Gerometta
3. *MEMBRANE PROTEOMICS AND CADMI EXPRESSION IN THE MOUSE LENS.* **S. Bassnett**, A. De Maria, P. Wilmarth, Y. Shi, L. Van Der Weyde, L. David
4. *THE REGULATION OF AQP0 BY CALCIUM-CALMODULIN.* **T. Gonen**, S.L. Reichow
5. *IDENTIFICATION OF A-KINASE ANCHORING PROTEINS IN LENS TISSUE.* **J.D. Scott**, M. Gold, S. Reichow, T. Gonen

8 US - Japan Cooperative Cataract Research Group

10:10 AM Coffee Break

10:30 AM Session 6 LENS TRANSPORT

Moderators: R. Mathias and J. Hall

1. *FLUX STUDIES IDENTIFY DIFFERENT K CHANNELS DURING REGULATORY AND APOPTOTIC VOLUME DECREASE IN HUMAN LENS EPITHELIAL CELLS.* **A.A. Chimote**
2. *LENS GAP JUNCTION CHANNELS EXHIBIT CONNEXIN-SPECIFIC PERMEABILITY TO CYCLIC NUCLEOTIDES.* **T.W. White**, G. Mese, L. Valiuniene, P.R. Brink, V. Valiunas
3. *INTRACELLULAR FLUID FLOW IN THE LENS IS MEDIATED BY GAP JUNCTION CHANNELS.* **R.T. Mathias**
4. *ROLES AND REGULATION OF AQP0 IN THE LENS.* **J. Hall**, K. Cahalan, D. Clemens, K. Kalman, A. Froger
5. *CALMODULIN MEDIATES THE CA²⁺ DEPENDENT REGULATION OF ALL THREE LENS GAP JUNCTION CONNEXINS.* **C.F. Louis**, M. Lurtz, J. Yang, Y. Zhao, Y. Chen
6. *REGULATION OF LENS EPITHELIUM NA,K-ATPASE ACTIVITY BY SRC KINASES.* **N. Delamere**, M. Shahidullah, A. Mandal, C. Beimgraben

12:30 PM Box Lunch; Afternoon and Evening Free

Wednesday, December 9

9:00 AM Session 7 LENS CRYSTALLINS

Moderators: K. Lampi and J. Pande

1. *DEAMIDATION INDUCES LOCAL STRUCTURAL CHANGES IN β B2-CRYSTALLIN.* **K.J. Lampi**, T. Takata, J.A. Lampi

US - Japan Cooperative Cataract Research Group 9

2. *HUMAN α B-CRYSTALLIN IN RECOGNIZES N-TERMINAL UNFOLDED/C-TERMINAL FOLDED INTERMEDIATES TO SUPPRESS AGGREGATION OF HUMAN γ D-, γ C- AND γ S-CRYSTALLINS: CHAPERONE SATURATION MODEL FOR ADULT LENS CATARACT.* **J. King**, K. Drahos, L. Acosta-Sampson
3. *INDEPENDENT EXPRESSION AND EXISTENCE OF α A-CRYSTALLIN AND α B-CRYSTALLIN IN THE DEVELOPING OCULAR LENS.* **S.P. Bhat**, J. Horwitz, R.K. Gangalum, Z. Jing, J. Lee

10:00 AM Coffee Break

4. *BINDING OF PROTEINS TO MEMBRANES AND AGING OF THE HUMAN LENS.* **R.J.W. Truscott**
5. *POSSIBLE FUNCTION FOR β A3/A1-CRYSTALLIN IN RETINAL PIGMENT EPITHELIUM.* **G. Sehrawat**, C. Zhang, R. Grebe, S.L. Hose, G.A. Luty, D. Sinha, J.S. Zigler, Jr
6. *ALZHEIMER'S DISEASE AMYLOID- β LINKS LENS AND BRAIN PATHOLOGY IN DOWN SYNDROME.* **J.A. Moncaster**, R. Pineda, R.D. Moir, S. Lu, M.A. Burton, J.G. Ghosh, M. Ericsson, S.J. Soscia, A. Mocofanescu, R.D. Folkerth, R.M. Robb, J.R. Kuszak, J.I. Clark, R.E. Tanzi, D.G. Hunter, L.E. Goldstein

11.45 AM Lunch

1:00 PM Session 8 ALPHA-CRYSTALLINS AND LIGHT SCATTERING

Moderators: K. Sharma and V. Bantseev

1. *EFFECT OF α A66-80 PEPTIDE ON CHAPERONE FUNCTION OF α A- AND α B-CRYSTALLINS.* **K. Sharma**, S. Puttur, R. Murugesan
2. *HOMOLOGOUS AND HETEROLOGOUS INTERACTIONS AMONG LENS CRYSTALLINS AND IMPLICATIONS FOR CATARACT.* **J. Pande**, P.R. Banerjee, A. Krishnamurthy, A. Pande

10 US - Japan Cooperative Cataract Research Group

3. *INSIGHTS INTO THE ANTI-APOPTOTIC FUNCTION OF HUMAN ALPHAA-CRYSTALLIN.* **R.H. Nagaraj**, N. Pasupuleti¹, A.I. Doseff², S. Matsuyama³, D. Danielpour
4. *DYNAMIC LIGHT SCATTERING ESTIMATION OF ALPHA-CRYSTALLIN CONTENT OF THE YOUNG HUMAN LENS NUCLEUS IN VIVO: CLINICAL IMPLICATION.* **J.S. Zigler, Jr.**, R.R. Ansari, S. Vitale, F.L. Ferris, M.B. Datiles II
5. *HUMAN AGE-RELATED NUCLEAR CATARACTS: ULTRASTRUCTURE AND THEORETICAL ANALYSIS OF SCATTERING SOURCES.* **M.J. Costello**, S. Johnsen, S. Metlapally, K.O. Gilliland, D. Balasubramanian
6. *THE STRUCTURE OF THE LENS FIBER CYTOPLASM AS DETERMINED BY CONICAL TOMOGRAPHY.* **N. Fain**, C. Schietroma, L.M. Zampighi, X. Gong, G.A. Zampighi

3:00 PM Session 9 POSTER SESSION with Refreshments in Kahalu'u 1 & 2

Moderators: Y. Akagi and P. Kador

3:30 PM Oral Presentations of Each Poster 6 Minutes with 4 Slide Maximum

6:00 PM Kinoshita Lecture in Kahalu'u 1 & 2 M. Lou *THE YIN & YANG EFFECT OF ROS ON EYE LENS*

7:00 PM Cocktails in Kalanikai

7:30 PM Banquet in Kalanikai

Thursday, December 10

8:30 AM Session 10 Lens Cell Biology/Signaling

Moderators: D. Li and A. Arrigo

1. *CHAPERONE MIMICS STRATEGY AS AN APPROACH TOWARDS DISEASES INDUCED BY MUTATIONS IN ALPHAB-CRYSTALLIN.* **A. Arrigo**
2. *SUMOYLATION OF THE 32 KD PAX-6 ACTIVATES ITS TRANSCRIPTIONAL REGULATION ON A UNIQUE SET OF DOWNSTREAM GENES.* **L. Gong, Q. Yan, D. Yuan, L. Zhang, J. Liu, M. Deng, S. Sun, H. Ma, D.W. Li**
3. *COMPARISON OF SIGNALING BETWEEN DIABETIC RAT LENSES AND RAT LENSES CULTURED IN VITRO WITH HIGH GLUCOSE.* **P. Zhang, J. Randazzo, K. Blessing, P.F. Kador**
4. *PROTEIN PHOSPHATASE-1 REGULATES AKT1 SIGNAL TRANSDUCTION PATHWAY TO CONTROL GENE EXPRESSION, CELL DIFFERENTIATION AND SURVIVAL.* **D.W. Li, L. Xiao, L. Gong, D. Yuan, M. Deng, Y. Xiao, W. Liu, J. Zhang, Y. Liu**
5. *CHANGES IN THE LENS THAT PRECEDE AND CONTRIBUTE TO AGE-RELATED CATARACT.* **N. Wolf, W. Pendergrass, G. Zitnik, S. Urfer**
6. *LYSINE 6 ON UBIQUITIN IS REQUIRED FOR LENS CELL DIFFERENTIATION, INCLUDING KINASE DEPENDENT DENUCLEATION.* **A. Taylor, A. Caceres, F. Shang, A. Cvekl, Y. Yang, E. Wawrousek, J. Kuszak, E. Dudek, O. Avidan**

10:30 AM Closing Remarks

11:30 AM Depart

POSTER SESSION

- P.1. *α -CRYSTALLINS INTERACT WITH CASPASE-3 AND BAX TO MEDIATE THEIR ANTIAPOPTOTIC FUNCTIONS.* **J. Liu**, Lili Gong, Z. Cao, X. Zeng, M. Deng, L. Zhang, S. Sun, H. Ma, D.W. Li
- P.2. *STUDY OF REFLECTED LIGHT FROM THE BACK SIDE OF LENSES (GLASSES OR SUNGLASSES), AS A PENETRATION ROUTE INTO THE EYE.* **M. Kojima**, Y. Ishiba, Y. Iwai, K. Sasaki, H. Sasaki
- P.3. *THE EFFECT OF ASTAXANTHIN ON SCAVENGING ACTIVITY IN THE AQUEOUS HUMOR.* **H. Hashimoto**, K. Arai, J. Takahashi, M. Chikuda, Y. Obara
- P.4. *PUPILLOPLASTY AND INTRAOCULAR LENS IMPLANTATION FOR PUPIL ABNORMALITY WITH APHAKIA OR CATARACT.* **H. Guo**
- P.5. *SURGICAL OUTCOMES OF PHACOEMULSIFICATION (PHACO) COMPARED WITH SMALL-INCISION CATARACT SURGERY (SICS) IN CATARACT PATIENTS.* **H. Guo**
- P.6. *THE EFFECT OF BACTERIAL PROLIFERATION TO LENS CAPSULE.* **K. Tanaka**, S. Kobayakaw, Y. Suzuki, T. Tochikubo
- P.7. *THE TOUGH MEMBRANE FORMATION ON THE INTRAOCULAR LENS OPTIC BY SERUM ALBUMIN.* **S. Kumashiro**, S. Kobayakaw, T. Nagaoka, T. Tochikubo
- P.8. *MECHANISMS OF CONDENSATION ON INTRAOCULAR LENSES AFTER FLUID-GAS EXCHANGE.* **E. Matsui**, H. Matsushima, J. Hidaka, T. Senoo
- P.9. *INFLUENCE OF NUCLEAR OPACITY ON INTRAOCULAR HIGHER-ORDER ABERRATIONS.* **N. Hatsusaka**, Y. Sakamoto, E. Shibuya, N. Mita, H. Sasaki
- P10.. *COMPARISON OF TEMPERATURE ELEVATION IN OCULAR TISSUE BY 18- 40 GHZ RADIO-FREQUENCY EXPOSURE.* **Y. Yamashiro**, M. Kojima, A. Hirata, T. Sakai, S. Watanabe, M. Taki, Y. Sakamoto, K. Sasaki, H. Sasaki

- P.11. *INFLUENCE OF AGE AND AXIAL LENGTH ON INTRAOCULAR HIGHER ORDER ABERRATIONS.*
E. Shibuya, Y. Sakamoto, N. Yamamoto, H. Sasaki
- P.12. *RELATIONSHIP BETWEEN THE DENSITY OF LENS EPITHELIAL CELL AND ALDOSE REDUCTASE WITH THE CATARACT OF DIABETES MELLITUS PATIENT.* **T. Matsumura**, Y. Kumamoto, Y. Takamura, E. Kubo, Y. Akagi