International Conference on the Bioscience of Lipids

Editor

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2013 NEWSLETTER

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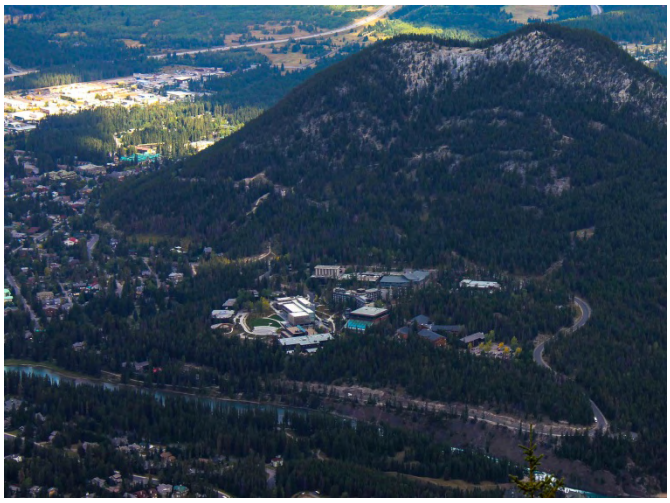
Banff, Canada, September 4-9, 2012
Social Report: "The Banff Lipid Experience"

The 53rd IBCL conference in Banff (Alberta, Canada) was co-organized together with the Canadian Lipoprotein Conference and the ASBMB. The conference venue was the Banff Center situated just a few paces south from the Banff town center. Majestic mountains encircle the town, which is at an elevation of more than 1400 m. The air at that altitude was crisp and clear and helped us all to stay focused on both the scientific and the social part of the conference.



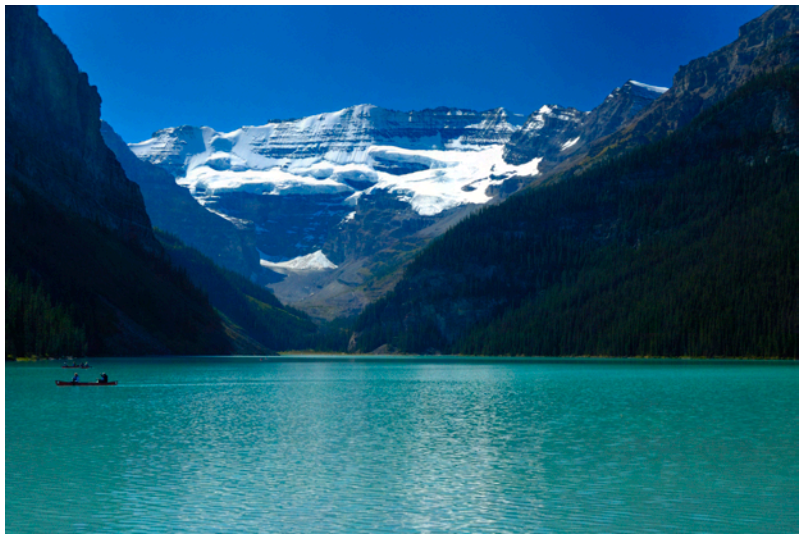
The Banff Centre from one of the summits

On the morning of September 5, Dennis Vance, the chair of the organizing committee, welcomed all participants (close to 300 persons) and opened the conference by introducing the van Deenen lecturer, professor Rudi Zechner from Austria. Zechner´s excellent talk started the first session which was about the "dynamics of triacylglycerol metabolism". Later in the afternoon the scientific topic changed to "phospholipid function". On Wednesday evening, all participants were invited to an opening reception, where beverages and Japanese cuisine was served in the Husky Great Hall. Participants clearly enjoyed the event, which allowed for greeting old friends and making new ones.

On Thursday, scientific sessions continued for the full day, with presentations related to "lipid signaling and regulation" and "cholesterol metabolism". The CLC members had their own young scientist session late on Friday night. Presentations regarding "lipids and disease" were given both on Friday morning and on Saturday afternoon, whereas the scientific topic of Saturday morning was "fatty acid metabolism".

The high quality of the presentations of all speakers was manifested by the very high attendance of participants in all sessions, morning and evening, and lasting until the last talk on Saturday afternoon. The conference room had comfortable seating and allowed for an enjoyable listening and viewing of the presentations.

Lunch and poster sessions were arranged on the premises each day, and allowed for many opportunities for lively discussions between participants after each session. The posters, which were of high quality, drew large crowds for each session. I think both presenters and "viewers" were very satisfied.



Lake Louise

The traditional afternoon excursion took place on Friday, and led us all on a bus trip along a scenic road leading to Lake Louise (1750 m) and further to the Moraine Lake (1884 m). The beauty of the scenery was breathtaking, as we walked on the shores of the two lakes. Luckily, the weather was very sympathetic during the trip.

Lake Moraine

The climax of the social program was reserved for Saturday evening, after the meeting proper was closed. We took a short bus ride outside the town center of Banff, and were invited into a large tent-like structure where cowboys were entertaining us with song and music. Drinks were served and people mingled happily.

ICBL participants having a drink before the BBQ

Later a western style BBQ was served and everybody enjoyed the servings. The bar remained open! During the early evening, there was a short oral presentation and poster presentation awards ceremony, followed by awards from the CLC. After dessert was served and enjoyed, line dancing commenced with many happy and eager participants joining.

Two snapshots at the BBQ western style banquet

Dancing time after the BBQ

Stars twinkled and the late night air was crisp as we eventually were bused back to our hotels – with happy memories of another successful ICBL "gala" dinner.

J. Peter Slotte
President of the ICBL

53rd International Conference on the Biosciences of Lipids (ICBL)
Banff, Canada, September 4-9, 2012
Scientific Report: "Frontiers in Lipid Biology"

The 53rd International Conference on the Biosciences of Lipids (ICBL), entitled "*Frontiers in Lipid Biology*", was held from Sept. 4-9, 2012, in Banff, Alberta, Canada. The ICBL conference is organized annually at different locations around the world as a forum for presentation and discussion of recent discoveries in lipid research. This year's meeting was, for the first time, held in Canada in Banff National Park in the heart of the beautiful Canadian Rocky Mountains. An unusual feature of the 53rd ICBL was that it was a joint meeting of three well-established organizations: the ICBL, the 37th Canadian Lipoprotein Conference (CLC) and the American Society for Biochemistry and Molecular Biology (ASBMB) who provided exceptional administrative assistance for the meeting. The organizing committee members were from Canada (Dennis Vance, Jean Vance, Richard Lehner, Rene Jacobs, Dawei Zhang, Spencer Proctor, Donna Vine, Simonetta Sipione), the United States (William Dowhan) and Austria (Fritz Spener). As a reflection of the increasingly international nature of lipid research, ~300 scientists and accompanying persons from 25 different countries in Europe, North America, South America, Asia, Africa and Australia attended with many participants from Canada, USA, Brazil and Japan.

The meeting was held at the Banff Centre for the Arts on Tunnel Mountain overlooking the town of Banff with panoramic views of the spectacular Rocky Mountains. The Banff Centre is a globally respected arts, cultural and educational institution established in 1933 by the University of Alberta with financial support from the Carnegie Foundation; the mission of the Banff Centre is "Inspiring Creativity". The Centre's Summer School is the major summer school for the arts in Canada and offers programs in the performing and fine arts. A premier event at the Centre is the renowned week-long Banff International String Quartet Competition that is held every 3 years. Another popular event is the annual Banff Mountain Film Festival. The Banff Centre features an outstanding conference centre, site of the Frontiers in Lipid Biology meeting. Accommodation and meals were provided on site as well as recreational facilities including a fine swimming pool and exercise facilities. All lectures were given in the Max Bell Hall adjacent to venues for coffee breaks, lunches and poster sessions. The Banff Centre is a 10 min walk from the town of Banff where many trendy shops and restaurants invite those wishing to partake.

The conference opened with introductory remarks by Dennis Vance (University of Alberta) who is a member of all three participating organizations and was primary organizer of the meeting. The scientific program consisted of 7 sessions each of which included plenary talks by invited speakers selected on the basis of both their outstanding research and their ability to present a clear and stimulating talk; a total of 20 internationally recognized scientists were invited to give these plenary talks. In addition, 12 shorter talks on late-breaking research were presented. An important feature of the conference was the emphasis placed on presentation and discussion of research of young investigators and trainees (graduate students/postdoctoral fellows). Each of the organizing societies is known for actively promoting trainee participation. An international committee selected 26 short talks on the basis of abstracts submitted by trainees. In addition, all scientists had ample opportunity for highlighting their research in three poster sessions; each poster was available for viewing for 3 h. The first day ended with a reception at which old friendships were renewed and new connections established.

Session #1 "Dynamics of Triacylglycerol Metabolism" (chairs **Richard Lehner** and **Khosrow Adeli**). A highlight of this session was the Laurens van Deenen Lecture, named in honor of the revered pioneer of lipid research from Utrecht University. This year's outstanding lecture, entitled "Lipolysis: how fat catabolism affects lipid and energy metabolism", was given by **Rudi Zechner** (Graz, Austria) who discussed the role of ATGL in lipolysis and in the provision of fatty acids for mitochondrial oxidation. Next, a talk on mechanisms of cellular lipid synthesis and storage was given by **Bob Farese** (San Francisco, USA) who talked about lipid droplets and different functions of DGAT1 and DGAT2. Two short talks on lipolysis by ATGL were given by **Caleb Lord** (Winston Salem, USA) and **Petra Kienesberger** (Edmonton, Canada). **Steve Young**'s (Los Angeles, USA) lecture provided new insights into the role of the GPI-binding protein-1 in lipolysis by lipoprotein lipase at the capillary endothelium. The involvement of CIDE-a protein in lipid metabolism and hepatic steatosis was the topic of a short presentation by **Linkang Zhou** (Beijing, China). The final short talk of the session was presented by **George Carman** (New Brunswick, USA) who was the first to establish the molecular nature of phosphatidate phosphohydrolase. He presented intriguing data on identification of a new yeast phosphatidate phosphohydrolase.

Session #2 "Phospholipid Function" (chairs **Bill Dowhan** and **Suzanne Jackowski**). This session was in memory of Eugene Kennedy, the universally acknowledged grandfather of phospholipid research. The first talk was dedicated to the memory of Christian Raetz and delivered by **Dennis Voelker** (Denver, USA) who gave a fascinating presentation on how phosphatidylglycerol, a quantitatively minor component of lung surfactant, regulates innate immunity in the lung. **Sergio Grinstein** (Toronto, Canada) discussed his recent work on the role of phosphoinositides and phosphatidylserine in generating membrane surface charge and thereby targeting proteins. Next, two short talks by trainees **Guergana Tasseva** (Edmonton, Canada) and **Susanne Horvath** (Graz, Austria) focused on production of phosphatidylethanolamine by decarboxylation in mitochondria. After the coffee break **Amy Walker** (Worcester, USA) gave a short talk on alternative mechanisms for activation of the transcription factor SREBP-1 in Metazoans. The regulation of phospholipid synthesis by the direct (non-genomic) action of the c-Fos protein at the ER was presented in a short talk by **Betty Caputto** (Cordoba, Argentina). The session ended with short talks by **Jelske van der Veen** (Edmonton, Canada) and **Ratnesh Singh** (Guelph, Canada) on gluconeogenesis in PEMT-deficient mice and the role of CTP:phosphoethanolamine cytidylyltransferase in lipoprotein secretion and clearance), respectively.

Session #3 "Lipid Signaling and Regulation" (chairs **Vytas Bankaitis** and **Masato Umeda**). The exciting topic of signaling mediated by endocannabinoids in the nervous system was presented by **Ben Cravatt** (San Diego, USA), after which **Joost Holthuis** (Utrecht, the Netherlands) gave a talk on sphingomyelin synthases and regulation of apoptosis. Next, **Maurizio Crestani** (Milan, Italy) discussed the regulation of lipid and energy metabolism by histone deacetylates in adipose tissue. A short talk was given by **Carl Mousley** (College Station, USA) who discussed how, in yeast, the sterol-binding protein Kes1 integrates lipid metabolism with nutrients in the TGN/endosomal system. In the next plenary talk, **Clay Semenkovich** (St. Louis, USA) presented novel data on the role of alkyl ether lipids and the peroxisomal enzyme PexRAP in development of obesity. Also in relation to obesity, **Pontus Bostrom** (Stockholm, Sweden) gave a short talk on fatty acid metabolism in muscle and its impact on metabolic disease. The final short talk of this session was by **Andrea Dichlberger** (Helsinki, Finland) on the role of acyl-CoA synthetases in regulating arachidonic acid production for eicosanoid synthesis in mast cells.

Session #4 "Cholesterol Metabolism" (chairs **Bernardo Trigatti** and **Suzanne Pfeffer**). The afternoon session began with two plenary talks, the first by **Bao-Liang Song** (Shanghai, China) who talked about cholesterol uptake by the small intestine via the transporter NPC1L1 and showed that cholesterol deficiency promotes NPC1L1 movement to the plasma membrane. In the second talk, **Kazu Ueda** (Kyoto, Japan) discussed the mechanism of HDL formation via the ABCA1 transporter and demonstrated that the ABCG1 transporter

effluxes 24-hydroxycholesterol from neurons. In a short talk, **Ernst Steyrer** (Graz, Austria) provided exciting new data on the importance of phosphatidylethanolamine *N*-methyltransferase for intestinal chylomicron secretion. Next, **Leticia Gonzalez Jara** (Hamilton, Canada) gave a short talk on the impact of diabetes on heart disease in apo E-hypomorphic mice lacking the scavenger receptor SR-B1. After the coffee break, **Andrew Brown** (Sidney, Australia) provided new insights into how cellular cholesterol levels are regulated, and **Angel Baldan** (St. Louis USA) presented his exciting new work on regulation of bile secretion by the micro-RNA, miR-33. Finally, two short talks were given by trainees **Iulia Iatan** (Montreal, Canada) and **Willeke de Haan** (Vancouver, Canada) on HDL biogenesis, and the role of ABCA1 in adipose tissue, respectively.

Session #5 "Lipids and Disease-1" (chairs **Neale Ridgway** and **Mario Silva-Neto**). The first two talks in this session were on the genetics of lipid disorders: **Helen Hobbs** (Dallas, USA) provided exciting new insights into the role of the phospholipase PNPLA3 in development of fatty liver, and **Rob Hegele** (London, Canada) discussed his latest data on the genetics of human triglyceridemia. Next, a short talk by **Hideki Hayashi** (Kumamoto, Japan) demonstrated that glia-derived apo E-containing lipoproteins protect retinal ganglion neurons from apoptosis in glaucomatous optic neuropathy, and **Yohei Ishibashi** (Wako, Japan) talked about the regulation of glucosylceramide synthesis by AMP-activated kinase. After the break, **Karen Reue** (Los Angeles, USA) gave a plenary talk on her recent research on genetic factors that underlie sex differences in metabolic disease. A short talk by **Jennifer Sacco** (Toronto, Canada) on regulation of VLDL production by the GLP-1 receptor, and a short talk by **Nanda Gruben** (Groningen, the Netherlands) on hepatic insulin resistance in *Ldlr KO* mice, completed the Friday morning session. On Friday evening, 8 short talks were given by Canadian trainees and many non-CLC participants attended. The session was chaired by **Cheryl Wellington** and **Scot Stone**. Talks were given by **Steve Poirier**, **Mia Golder**, **Vanessa DeClercq**, **Rabban Mangat**, **Robin da Silva**, **Jeevan Nagendran**, **Brittnee Zwicker** and **Kristin Bowden**.

Session #6 "Fatty Acid Metabolism" (chairs **James Ntambi** and **Chuck Rock**). The session opened with a plenary lecture by **Jay Horton** (Dallas, USA) on regulation of fatty acid synthesis by two recently identified factors: Mig-12 and S14. Next, **Gary Lopaschuk** (Edmonton, Canada) presented his work on fatty acid oxidation in the heart. **Morgan Fullerton** (Hamilton, Canada) gave a short talk on the action of metformin, a drug used to treat diabetes, on acetyl-CoA carboxylase-1 and -2. Another short talk was given by **Roberta Leonardi** (Memphis, USA) on the role of pantothenate kinase in obesity and hyperglycemia. Next, **Dagmar Kratky** (Graz, Austria) presented her recent work on inhibition of DGAT1 and atherosclerosis. Three more short talks by **Miriam Jacome-Sosa** (Edmonton, Canada) on trans-fatty acids and metabolic syndrome, **Maggie Strable** (Madison, USA) on metabolic effects of mono-unsaturated fatty acids in the liver, and **Elijah Magrane** (Montreal, Canada) on mice deficient in fatty acid binding proteins, completed the session.

Session #7 "Lipids and Disease-2" (chairs **Rene Jacobs** and **Spencer Proctor**). In the first talk of the final session, the rapidly expanding topic of autophagy was discussed by **Ana Maria Cuervo** (New York, USA), after which **Cheryl Wellington** (Vancouver, Canada) presented her recent research on HDL in the brain and the peripheral circulation. New data on the role of macrophage cholesterol transporters in atherosclerosis were presented by **Miranda van Eck** (Leiden, the Netherlands). The conference ended with a talk by **Dawei Zhang** (Edmonton, Canada) on sterol translocation by the transporter ABCG1.

Maurizio Crestani made some closing remarks and invited everyone to attend the 54th ICBL entitled "Linking Transcription to Physiology in Lipidomics" that will take place in Bari, Italy from September 17-21, 2013.

Dennis and Jean Vance
On behalf of the Organizing Committee of the 53rd ICBL

The Poster Awards of the 53rd ICBL
Frontiers in Lipid Biology

The Western style BBQ and meeting banquet was held just outside Banff at the Brewster´s Mountain View Barbeque on Saturday night, after completion of the scientific sessions. Before commencing line-dancing and the Western-style entertaining, the traditional ICBL Poster Awards were announced. Members of the 2012 Poster Award Jury were: J Peter Slotte (chairman), Finland; Beatriz Caputto (Argentina); Andrew Brown (Australia), Barbara Karten (Canada), Thomas Lagace (Canada), Christina Leslie (USA), and Charles Rock (USA). From about 80 posters which were presented by young scientists, 30 were pre-selected as finalists by the Poster Award Jury. The pre-selected posters were more closely inspected by all members of the Poster Award Jury during the Conference poster sessions. Criteria for selecting the top posters were the relevance of the topic, originality of the subject, the quality of the presentation, the visual appearance, and discussions with the presenter. In this year's Award presentation, one award was sponsored by ***Progress in Lipid Research***, whereas two awards were sponsored by ***ASBMB***. The abstracts of the three winning posters are shown below. The ICBL community is proud of the high quality of the posters presented at the Banff meeting and congratulates the three winners.

J. Peter Slotte
President of ICBL

The winners of the 2012 ICBL Poster Awards were:

Progress in Lipid Research Poster Award

Choline Kinase β is an Important Regulator of Endochondral Bone Formation
Zhuo Li[1], Gengshu Wu[1], Roger B. Sher[2], Kayla Rumack[3], Gregory A. Cox[2], Michael R. Doschak[1], Monzur Murshed[4], Frank Beier[3], Dennis E. Vance[1]
[1]University of Alberta, [2]The Jackson Laboratory, [3]University of Western Ontario, [4]McGill University

Choline kinase is the first enzyme in the choline pathway to generate phosphatidylcholine and converts choline to phosphocholine. Choline kinase has two isoforms encoded by the genes Chka and Chkb. Inactivation of Chka results in embryonic lethality, whereas Chkb mutant mice display neonatal forelimb bone deformation. To understand the mechanisms of the bone deformation phenotype, we characterized the major long bones in the forelimb. We found that the deformation is specific to the radius and ulna and the deformation occurs during the late embryonic stage. We also found that the radius and ulna in mutant mice display abnormal chondrocyte cell morphology, unorganized proliferative columns and expanded hypertrophic zones in their growth plates as well as delayed formation of primary ossification centers. To further understand these phenotypes, we examined chondrocyte differentiation, proliferation, maturation, cartilage extracellular matrix (ECM) degradation and mineralization events. The gene expression analysis suggested that the mutant chondrocytes still maintain normal differentiation, proliferation and maturation properties. However, we found the cartilage in mutant mice may have diminished ECM degradation by matrix metalloproteinase 9 and 13. In addition, matrix of mutant chondrocytes shows impaired mineralization both in vivo and in vitro. Taken together, our data suggests that choline kinase beta plays an important role in endochondral bone formation through regulation of growth plate chondrocyte physiology.

Zhuo Li (right) and J. Peter Slotte (Left)

ASBMB Poster award I

An EPR-based assay to measure ApoA-I displacement from HDL in human plasma reveals lower levels of displacement for individuals with coronary artery disease and diabetes

Mark S. Borja[1], Kalistyn H. Lemke[1], Bradley Hammerson[1], Jacques Genest[2], Michael N. Oda[1]
[1]Children's Hospital Oakland Research Institute, CA 94609, [2]McGill University, Montreal, QC H3A 1A1, Canada

High density lipoprotein (HDL) prevents coronary artery disease (CAD) by mediating reverse cholesterol transport, a process wherein cholesterol is effluxed from peripheral cells to the liver and steroidogenic organs. Cholesterol efflux requires the presentation of cholesterol by an energy-dependent process (ATP binding cassette transporter A1 (ABCA1)) and the availability of lipoprotein recipients/carriers of cholesterol. In the arterial wall, desorption of lipid-free/lipid-poor apolipoprotein A-I (ApoA-I) from HDL is the most plausible source of cholesterol acceptor, required to initiate de novo ABCA1-mediated cholesterol efflux and is this a rate-limiting factor. Recently, CAD status has been strongly associated with cholesterol efflux capacity. Importantly, chronic inflammation leads to an increase in oxidative events, particularly oxidation of ApoA-I by the enzyme myeloperoxidase, which impairs cholesterol efflux capacity with a concomitant reduction in the displacement/desorption of lipid-free/lipid-poor ApoA-I from HDL. Current processes for quantifying HDL efflux potential of human plasma are laborious, time consuming, costly, and employ cell culture and radioactive compounds. Here, we present an electron paramagnetic resonance (EPR) based assay to measure the exchange of ApoA-I on and off HDL particles in human plasma. By adding nitroxide spin-labeled ApoA-I directly to plasma, we can observe changes in the EPR spectrum indicative of binding to HDL particles and displacement of resident endogenous ApoA-I. Analysis of plasma samples from individuals with active CAD and/or diabetes reveal reduced levels of ApoA-I displacement when compared to healthy individuals, which is an indicator of reduced cholesterol

efflux capacity in these patients. Our findings demonstrate that our EPR-based assay may be a promising new method to detect changes in plasma HDL that reflect a reduced capacity to mobilize cholesterol.

Mark S. Borja (right) and J. Peter Slotte (Left)

ASBMB Poster award II

The Liver X Receptor agonist GW3965 improves behavioral and neuropathological outcomes after mild repetitive closed head injury in mice

Dhananjay Namjoshi[1], Georgina Martin[1], James Donkin[1], Anna Wilkinson[1], Jianjia Fan[1], Sophie Stukas[1], Mike Carr[1], Jeniffer Chan[1], Cheryl Wellington[1]
[1]The University of British Columbia, Vancouver, BC, Canada

Traumatic brain injury (TBI) increases Alzheimer's Disease (AD) risk and leads to deposition of neurofibrillary tangles and amyloid deposits similar to those found in AD, suggesting that therapeutic strategies in development for AD may also be of potential interest for TBI. Agonists of Liver-X-Receptors (LXR), which regulate the expression of many genes involved in lipid homeostasis and inflammation, consistently improve cognitive function and reduce neuropathology in AD mice. One pathway by which LXR agonists exert their beneficial effects is through ABCA1-mediated lipid transport to apolipoprotein E (apoE), which enhances apoE function.

To test the therapeutic utility of the LXR agonist GW3965 for TBI, we subjected male wild-type (WT) and apoE-/- mice to mild repetitive traumatic brain injury (mrTBI) followed by treatment with vehicle or GW3965 at 15 mg/kg/day.

mrTBI impaired novel object recognition memory of WT and apoE-/- mice in both control and treatment groups within 2d with no spontaneous recovery in untreated mice. GW3965 restored memory in WT but not apoE-/- mice by 7d. Accelerating rotarod test revealed significant motor deficits in injured WT and apoE-/- mice within 24h, followed by spontaneous recovery by 14d independent of GW3965 treatment. Total soluble endogenous amyloid beta 40 and 42 levels were significantly elevated in WT and apoE-/- within 2d post-injury, a response that was suppressed by GW3965 in both genotypes. WT mice showed mild but significant axonal damage as determined by silver staining at 2d post-mrTBI, which was suppressed by GW3965 treatment. In contrast, apoE-/- mice showed severe axonal damage from 2 to 14d that was unresponsive to GW3965 treatment.

These results suggest that GW3965 can reduce some of the phenotypes induced by mrTBI in an apoE-dependent manner.

Cheryl Wellington (right) and J. Peter Slotte (Left)

The 53rd ICBL Young Investigator Awards

The final session of the ICBL meeting was capped off with the presentations of the ***Herbert Tabor Young Investigator Award***, which was awarded to Susanne E. Horvath (Austria), the ***ASBMB Award*** to Petra Kienesberger (Canada) and the ***Cell Metabolism Awards*** to Andrea Dichlberger (Finland) and Maggie S. Strable (USA).

Presenting the awards was George M. Carman (Associate Editor, Journal of Biological Chemistry). The titles and abstracts of the four Young Investigator award winner presentations are shown below.

Susanne E. Horvath (right) with George Carman (left)

Andrea Dichlberger (Finland) (right) with George Carman (left)

Maggie S. Strable (USA) (right) with George Carman (left)

George M. Carman
ICBL Corresponding Member

The winners of the 2012 ICBL Young Investigator Awards were:

JBC/Herbert Tabor Young Investigator Award: Susanne E. Horvath (Austria)

2231
Characterization of phosphatidylserine decarboxylase 1 from yeast
Susanne E. Horvath[1], Thomas Becker[2], Nikolaus Pfanner[2], and Günther Daum[1]
[1]Institute of Biochemistry, Graz University of Technology, Graz, Austria; [2]Institute of Biochemistry and Molecular Biology, ZBMZ, University Freiburg, Freiburg im Breisgau, Baden-Württemberg, Germany

The majority of phosphatidylethanolamine (PE), one of the prominent phospholipids from yeast membranes, is synthesized by phosphatidylserine decarboxylase 1 (Psd1), an enzyme localized to mitochondria. Like most mitochondrial proteins, Psd1 is synthesized on free ribosomes and imported into mitochondria where processing/protein maturation occurs. Psd1 in the precursor form contains a mitochondrial targeting sequence, an internal sorting sequence, and an a- and a b-subunit which are linked by an LGST cleavage site. Cleavage at this site leads to the mature and active form of the enzyme which contains a pyruvoyl group at the N terminus of the a-subunit. In this study we investigated the effect of mitochondrial processing peptidases on protein maturation and the topology of Psd1, in particular localization of a- and b-subunits within mitochondrial compartments. We report that two matrix-located processing peptidases, MPP and Oct1, sequentially remove N-terminal signal peptides from the Psd1 precursor. Cleavage of a- and b-subunit was prevented by replacing serine with alanine at the highly conserved LGST motif. This processing step does not depend on a membrane potential but is restricted to mitochondria. Localization experiments, including proteinase protection assays and carbonate treatment of mitochondria, showed that the b-subunit forms the membrane anchor for the intermembrane space-localized a-subunit of Psd1 and attaches the whole protein to the inner mitochondrial membrane. Deletion of the predicted membrane anchor within the b-subunit results in mislocalization and reduced activity of the enzyme, but does not affect separation of the nonidentical Psd1 subunits. This finding suggests that correct

localization of Psd1 is required for proper enzymatic activity and supply of the substrate to its site of conversion.

ASBMB Award: Petra Kienesberger (Canada)

2344

Obesity-induced Myocardial Steatosis and Cardiomyopathy Are Attenuated in Mice with Cardiomyocyte-specific ATGL Overexpression

Petra Kienesberger[1], Thomas Pulinilkunnil[1], Jeevan Nagendran[1], Emma Heydari[1], Rammy Khadour[1], Martin Young[2], Guenter Haemmerle[3], Rudolf Zechner[3], and Jason Dyck[1]
[1]University of Alberta, Edmonton, AB, Canada; [2]University of Alabama at Birmingham, Birmingham, AL; [3]University of Graz, Graz, Austria

Lipotoxic remodeling of the heart during obesity is associated with augmented myocardial triacylglycerol (TAG) deposition and diminished contractile function. However, it is unclear whether myocardial TAG accumulation contributes to cardiac dysfunction. To examine the role of adipose triglyceride lipase (ATGL), which regulates cardiomyocyte TAG accumulation, in cardiac metabolism and function during obesity, we fed wild-type (WT) and cardiomyocyte-specific ATGL-overexpressing (MHC- ATGL) mice chow or high fat-high sucrose (HFHS; 45 kcal% from fat) diet for 15 weeks. HFHS-fed WT and MHC-ATGL mice exhibited a comparable increase in body weight and developed similar glucose intolerance and systemic insulin resistance. Whereas HFHS feeding led to a 50% increase in cardiac TAG content in WT mice, despite increased myocardial ATGL protein expression, MHC-ATGL mice were protected from HFHS diet-induced cardiac steatosis. Importantly, systolic and diastolic functions were decreased in hearts from HFHS-fed WT, but not MHC-ATGL mice. To determine the effect of HFHS feeding on oxidative substrate metabolism, hearts were perfused *ex vivo* in the working mode. As reported previously, MHC-ATGL hearts showed decreased palmitate oxidation and increased glucose oxidation rates compared with the WT on chow diet. HFHS diet feeding led to an increased reliance on palmitate oxidation in both WT and MHC-ATGL hearts. However, HFHS-fed MHC-ATGL mice still exhibited reduced myocardial palmitate oxidation rates compared with the HFHS-fed WT mice, which was associated with decreased expression of the fatty acid utilization proteins, CD36, ACSL1, and UCP3. Collectively, these findings suggest that up- regulation of cardiac ATGL during HFHS diet-induced obesity is an adaptive albeit insufficient response to compensate for the increased accumulation of myocardial TAG and that overexpression of ATGL prevents excessive TAG accumulation and cardiomyopathy associated with diet-induced obesity.

Cell metabolism award: Andrea Dichlberger (Finland)

2347

Acyl-CoA Synthetases as Regulators of Arachidonic Acid Availability for Eicosanoid Metabolism in Human Mast Cells

Andrea Dichlberger[1], Stefanie Schlager[1], Reijo Käkelä[2], Wolfgang J. Schneider[3], and Petri T. Kovanen[1]
[1]Wihuri Research Institute, Helsinki, Finland; [2]University of Helsinki, Institute of Biotechnology, Helsinki, Finland; [3]Department of Medical Biochemistry, Medical University of Vienna, Vienna, Austria

Mast cells (MCs) are potent effector cells of innate immunity and are involved in various inflammatory diseases such as atherosclerosis. Activation of MCs triggers the release of potent biologically active lipid mediators deriving from arachidonic acid (AA). Importantly, human MCs have been shown to contain large amounts of AA in triglycerides (TGs) stored in cytoplasmic lipid bodies (LBs), which implies great potential for eicosanoid biosynthesis in this cellular compartment. Thus, our study aims at elucidating the role of MC lipid bodies with particular emphasis on their large TG

pool as a distinct source of AA for the generation of biologically active lipid mediators. Cultured human MCs generated from peripheral blood-derived CD34+ progenitors contain TG-rich cytoplasmic LBs. In contrast to saturated fatty acids (FAs), unsaturated FAs, such as AA and docosahexaenoic acid (DHA), are able to induce the formation of LBs in MCs, and AA is incorporated preferentially into the large TG pool of LBs. Triacsin C, a potent inhibitor of long chain acyl-CoA synthetases and *de novo* TG synthesis, efficiently blocks the AA-enhanced LB generation, thus leading to a depletion of LBs in these cells. The analysis of mRNA expression of ACSL family members revealed a significant increase of ACSL3 and ACSL4 transcripts during the initial phase of AA-enhanced LB formation. MC activation by antigen-induced IgE receptor-mediated cross-linking triggers a rapid release of large amounts of PGD2, which is totally blocked in triacsin C-treated MCs. Moreover, siRNA-mediated gene silencing of ACSL3 and ACSL4 leads to a significantly reduced release of PGD2 from activated MCs. Thus, ACSL3 and ACSL4 seem to play an important role in the genesis of AA-containing TGs during LB formation. Besides their implication in TG synthesis and LB generation, ACSL3 and/or ACSL4 might exert additional function(s) regarding the metabolism of eicosanoids in human mast cells.

Cell metabolism award: Maggie S. Strable (USA)

2400

Differential Metabolic Effects of Hepatic Monounsaturated Fatty Acids

Maggie S. Strable and James M. Ntambi
University of Wisconsin, Madison, WI

Stearoyl-CoA desaturase (SCD) catalyzes the *de novo* synthesis of monounsaturated fatty acids (MUFAs) from saturated fatty acids. Past work demonstrated that SCD1 deficiency impairs hepatic lipogenesis and protects against diet-induced obesity. Our objectives were to determine whether hepatic MUFA synthesis is sufficient to restore the impaired lipogenic program in SCD1 global knock-out mice (GKO) and to determine whether the major MUFA products of the SCD1-catalyzed reaction exert differential metabolic effects. To address our objectives, we produced liver-specific transgenic mice expressing either human SCD5, which preferentially synthesizes oleate (18:1n-9), or mouse SCD3, which preferentially synthesizes palmitoleate (16:1n-7), and introduced these transgenes into SCD1 GKO mice. The mice were fed a lipogenic high sucrose/very low fat diet for 10 days. Hepatic oleate synthesis induced hepatic lipogenic gene expression more than palmitoleate did whereas palmitoleate synthesis significantly induced hepatic mitochondrial fatty acid oxidation gene expression. Hepatic MUFA synthesis reduced hepatic PGC-1α expression. Additionally, oleate synthesis restored body weight and liver triglycerides to wild-type levels whereas palmitoleate synthesis did not significantly change these phenotypes. Hepatic oleate also increased plasma glucose levels to a greater extent than hepatic palmitoleate. Fatty acid composition of extrahepatic tissues was influenced by hepatic MUFA synthesis, whereas oleate was increased in SCD5Tg, and palmitoleate was increased in SCD3Tg epididymal white adipose tissue. Overall, this work suggests that hepatic MUFAs are involved in regulation of *de novo* lipogenesis, fatty acid oxidation, and gluconeogenesis and that oleate and palmitoleate exert differential effects on these pathways.

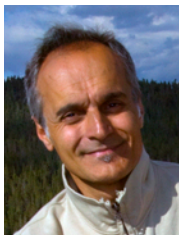
The ICBL Steering Committee 2013-2015

At the ICBL 2012 which took place in Banff, Canada, the ICBL Steering Committee for the upcoming years was elected. After serving for three years as ICBL President, Guenther Daum (Graz University of Technology, Austria) retired and Peter Slotte (Abo Akademi, Turku, Finland) took over the leadership.

Peter Slotte has been ICBL Vice President for the last 3 years. In 2007, he organized the ICBL in Turku, Finland. Peter Slotte's scientific interest is on the interplay between lipids in membranes with special emphasis on the role of sphingolipids. His laboratory develops and provides biophysical and analytical methods relevant for lipid and membrane research. Peter Slotte is author of numerous papers in highly ranked journals. His group is part of the Åbo Akademi Center of Excellence in Cell Stress and Molecular Ageing.


J. Peter Slotte


Lazlo Vigh


Maurizio Crestani


Peter Ott

As the new Vice President, **Laszlo Vigh** from the Biological Research Center of the Hungarian Academy of Sciences, Szeged, Hungary, was elected. Laszlo Vigh was the organizer of the ICBL 2006 in Pécs, Hungary. Together with the members of his group he is studying the stress sensing and signaling processes related to the lipid matrix of cell membranes and the operation of molecular chaperon like stress proteins.

The work of the new ICBL President and Vice President will be supported by **Maurizio Crestani** (ICBL Secretary) from the University of Milano, Italy; and by **Peter Ott** (ICBL PC Officer) from Bern, Switzerland. Both colleagues have been long-term members of the ICBL Steering Committee.

Besides the previous organizers of ICBL, **Ewa Świeżewska** (Polish Academy of Sciences, Warsaw, Poland) and **Félix M. Goñi** (Universidad del País Vasco, Bilbao, Spain), **Dennis Vance** will join the ICBL Steering Committee as a new Ordinary Member. Dennis Vance (University of Alberta, Edmonton, Alberta, Canada) was the organizer of the ICBL 2012 in Banff, Canada.


Dennis Vance


Ewa Świeżewska


Félix M. Goñi

Members of the new ICBL Advisory Board will be **Guenther Daum** (Graz University of Technology, Austria; Past-President since 2013), **Toon de Kroon** (Utrecht University, The Netherlands; elected 2011), **Banafshe Larijani** (London Research Institute, Lincoln's Inn Fields Laboratories, UK; elected 2012); and **Gabor Tigyi** (University of Tennessee, Health Science Center, Memphis, TN, USA).


Guenther Daum

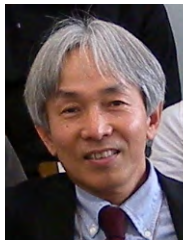

Toon de Kroon


Banafshe Larijani


Gabor Tigyi

Corresponding Members of the ICBL Steering Committee are **Andrew Brown** (elected 2009; re-elected 2012) from the University of New South Wales, Sydney, NSW, Australia; **Makoto Ito** (elected 2012) from the Kyushu University, Hakozaki, Fukuoka, Japan; **Richard Lehner** (elected 2012) from the University of Alberta, Edmonton, Alberta, Canada; **Peng Li** (elected 2007; re-elected 2010) from the Tsinghua University, Beijing, China; **Ram Rajasekharan** (elected 2010), Council of Scientific and Industrial Research (CSIR), Lucknow, India; **Norma B. Sterin-Speziale** (elected 2012), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Ciudad Autónoma de Buenos Aires, Argentina; and **Dennis R. Voelker** (elected 2012), Pulmonary Division Dept. Med. National Jewish Health, Denver, CO, USA.


Andrew Brown


Makoto Ito


Richard Lehner


Peng Li


Ram Rajasekharan


Norma B. Sterin-Speziale


Dennis R. Voelker

Guenther Daum
Past President of the ICBL

The 54th International Conference on the Biosciences of Lipids
"Linking transcription to physiology in lipidomics"
September 17-21, 2013
Bari, Italy


Preliminary program of the 54th ICBL

Tuesday, September 17, 2013

17th Laurens Van Deenen Lecture

Wednesday, September 18, 2013

Session 1: Nuclear receptors and the transcriptional regulation of lipid metabolism

Session 2: The gut-liver axis route for lipids: relevance in nutrition and life style

Thursday, September 19, 2013

Session 3: Dissecting lipid metabolism in diabetes and atherosclerosis

Session 4: Lipid metabolism, transcription, stemness

Friday, September 20, 2013

Session 5: Signal transduction, gene expression and circadian rhythm in the regulation of lipid metabolism

Special lecture dedicated to the memory of Giovanni Galli

Social program in Apulia

Gala dinner

Saturday, September 21, 2013

Session 6: Dynamics of membrane microdomains and pathophysiological implications

Session 7: Lipids and membranes in stress management: stress perception, signaling, repair and adaptation

Last update: December 20, 2012

Venue

Bari, Italy

The conference will be held at the Sheraton Nicolaus Hotel & Conference Centre in Bari, Italy. The hotel is located one mile from the Railway station (city center), seven miles from Bari-Palese airport and in proximity to the major highways. The Centre has excellent conference facilities and accommodations, and is readily accessible from Bari International Airport that is connected to all major international airports.

Co-chairmen: Antonio Moschetta (Bari) and Maurizio Crestani (Milano)

Local Organizers

Sandro Sonnino (Italy)
Donatella Caruso (Italy)
Emma De Fabiani (Italy)
Nico Mitro (Italy)
Giuseppe Palasciano (Italy)
Laszlo Vigh (Hungary)
Chiara De Girolamo (Italy)
Elda Desiderio Pinto (Italy)
Rachele Mizzi (Italy)

Address for correspondence

For any information about the 54th ICBL please contact ICBL Conference Secretariat.
e-mail: Antonio Moschetta (moschetta@negrisud.it), Maurizio Crestani (maurizio.crestani@unimi.it), Rachele Mizzi (rachele@cicsud.it). ICBL homepage: http://www.icbl.unibe.ch/

FUTURE CONFERENCE
55th International Conference on the Bioscience of Lipids
June 24-28, 2014
Aberdeen, UK

The Conference venue

View of Aberdeen

Venue: Robert Gordon University, Aberdeen

Organizing Committee
Chair: Cherry L. Wainwright, c.wainwright@rgu.ac.uk
Vice Chair: Klaus Wahle, k.wahle@abdn.ac.uk

Dino Rotundo, Anna Nicolau, Phil Whitfield, Giovanna Bermano, Marie Goua, Alan Sneddon, Jane MacKenzie, Iain Brown, Guenther Daum, Michel Lagarde, Stephen Cunnane, Sebastiano Banni, Michael Wakelam, Rolf Berge

Preliminary Scientific Program
Lipids in inflammation, health and disease
Endocannabinoid system in disease prevention/amelioration
Conjugated PUFA synthesis, obesity, disease prevention
Bioactive lipid synthesis and lipidomics in health and disease
Plant lipids as potential novel drugs
Phospholipids, ceramide metabolism: Cholesterol, lipoprotein metabolism
Membranes, microdomains; physiochemical changes and cell function

Maurizio Crestani
Secretary of ICBL Steering Committee