



# A LETTER FROM THE PRESIDENT

## 12th Biennial Meeting of the IEIIS Quickly Approaches



Dear IEIIS'ers,

The deadline for submitting abstracts for the joint meeting of the IEIIS and Society of Leukocyte Biology, to be held in Vancouver, October 7-9, has now come and gone, but there is still much to look forward to. Continue checking the meeting website for updates: [www.slbieeis2010.org](http://www.slbieeis2010.org). It promises to be an extraordinary meeting! Aside for an outstanding schedule of speakers and scientific symposia, there will be early morning "meet-the-professor" sessions, a mixer for graduate students and post-doctoral fellows (on October 7 at the Steamworks Brewing Co.) as well as an early morning session given by the NIH on new grant submissions. There will be a business meeting of the Society on Friday, October 8 at 8:30 AM.

The Vancouver Fairmont (not the Fairmont Waterfront!) will provide a superb setting for the meeting. A Vancouver landmark, it is centrally located in a beautiful downtown area, a short walking distance to the waterfront and Stanley Park. The rooms are lovely and reasonably priced, and the meeting area is outstanding, with comfortable meeting rooms, ample space for poster sessions, informal gatherings and coffee breaks. We would encourage all members to stay at the hotel. Sharing rooms would make an affordable room rate even more attractive. There will be an evening harbor cruise in a spectacular setting. Registration for this event will be on a first-come-first served basis. We strongly encourage you to bring your significant other, as this is an ideal time of year in Vancouver, and there are many interesting activities within both the city or just beyond. Some ideas for touring can be found on our website and the Vancouver Tourist Bureau will be in attendance to assist further.

There is still time to nominate individuals for Honorary Lifetime Membership, Nowotny and Bang awards. You may submit a nomination through a link on the IEIIS website or directly to Nancy Pollman at [IEIIS@aol.com](mailto:IEIIS@aol.com). **Honorary Lifetime Membership** in the Society recognizes outstanding career contributions to the knowledge and understanding of bacterial endotoxins and innate immunity. The Nowotny Award is given to "a young investigator who has shown excellence in research, made significant contributions to the study of endotoxin, shows potential for further scientific development and whose research is close to that pursued by Dr. Alois Nowotny".

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[www.ieiis.org](http://www.ieiis.org)

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## Nominations for IEIIS Office 2010-2012

The Nomination Committee has submitted the slate of candidates for the elected positions in the IEIIS to serve beginning October 2010. All active members are strongly encouraged to vote. An active member is defined as anyone who has paid 2010 Active Membership dues or holds an Emeritus or Honorary Life Member status. Student and Associate memberships do not have voting rights.

Electronic ballots will be distributed in July and accepted online. Members with current emails will be notified via an email containing a link to the ballot. Listed on page 4 are the offices and candidates for office that will be on the ballot. Kensuke Miyake, Japan, will be the incoming IEIIS President.

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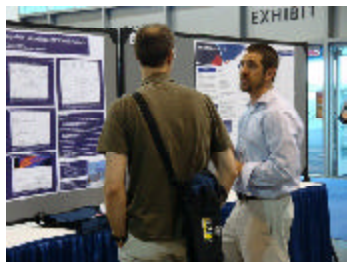
# IEIIS Travel Award Winners, 2008

Poster presentations and talks from selected abstracts greatly contributed to the success of the IEIIS meeting. The society provided travel awards for the submission of an outstanding abstract to the recent IEIIS meeting. This grant helped to defer travel costs to the IEIIS conference in Edinburgh. The IEIIS travel award winners for 2008 were:

- **Paula Beaumont**  
University of Edinburgh, UK
- **Thomas Cullen**  
Medical College of Georgia, USA
- **Jana Eckerts**  
AG Schumann, Germany
- **Monica D. Figueiredo**  
University of Georgia, USA
- **Pearl Gray**  
Cedars-Sinai Medical Center, USA
- **Bernt Christian Hellerud**  
Ullevål University Hospital, Norway
- **Jace W. Jones**  
University of Washington, USA
- **Ronan Kapetanovic**  
Institut Pasteur, France
- **Sara Montminy Paquette**  
Univ of Massachusetts Medical Center, USA
- **Ana Maria Suzuki**  
Nagasaki University, Japan
- **Quan Nhu**  
University of Maryland, USA
- **Nadra Nilsen**  
Norwegian Univ of Science and Technology, Norway
- **Alja Oblak**  
National Institute of Chemistry, Slovenia
- **Kate O'Brien**  
Queens Medical Center, UK
- **Suraj Patel**  
Massachusetts Institute of Technology, USA
- **Øyvind Bakken Rognstad**  
Norwegian University of Science and Technology, Norway
- **Pierre Tissieres**  
University of Geneva Medical Center, Switzerland

Congratulations to all of the awardees! To further recognize this accomplishment the IEIIS requested that awardees submit a picture of themselves or the conference, a brief description of their research, a comment about a presentation that they found to be especially interesting or relevant, or anything else creative. Some of these were printed in the last newsletter; below are additional submittals.

## Jace Joynes



Hello, I'm Jace Jones and a fifth year graduate student at the University of Washington in the department of chemistry. My present research involves structurally characterizing various outer membrane glycolipids extracted from numerous Gram-negative bacteria. In particular, we have focused on lipid A extracted from *Yersinia pestis* grown at 37C and 21C. Structural information was achieved via tandem mass spectrometry, including MALDI tandem time-of-flight, ESI ion trap, and ESI Fourier transform ion cyclotron resonance mass spectrometers. Identified structures are linked to function to help understand biological significance.

The photo is me standing in front of a poster I presented at a recent conference. Thanks, Jace Jones

## Alja Oblak



I have just finished my undergraduate studies in microbiology at the Biotechnical faculty, University of Ljubljana. I will start my graduate studies in biochemistry and molecular biology at the University of Ljubljana in October. My work at the National Institute of Chemistry Slovenia at the department of Biotechnology started two years ago, when I was a member of a student research team, competing at the

“International Genetically Engineered Machine” (iGEM) competition, held annually at MIT university in Cambridge, MA. Our team, that won the grand prize that year (2006), worked on modification of the mammalian cell signalling network of the innate immune response to bacterial infection, in order to prevent the development of sepsis.

After the competition I continued working at the department of Biotechnology. My work involves the study of TLR4's co receptor

protein MD-2; it's structure-function correlation, the comparison of the murine and human MD-2 and the impact of MD-2 on medical conditions, such as sepsis. Our current research focuses on the differences between human and murine MD-2, such as electrostatic potential, the amount of secreted soluble protein (sMD-2) and the ability of murine vs. human sMD-2 to bind LPS in solution. We identified differences in charged amino acid residues in murine vs. human MD-2 which contribute significantly to the differences in stability and function of murine and human sMD-2. Our findings help explain the differences in endotoxin sensitivity between the two organisms.

Since my work focuses on the protein, responsible for endotoxin recognition, the conference organized by the International Endotoxin and Innate Immunity Society promised to help expand my knowledge of this area. And it delivered. I especially benefited from the “LPS recognition” session, but also enjoyed the session on the innate and adaptive immunity interface, since a good knowledge of both areas and their mutual collaboration is critical for research, focused on clinical applications.

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## IEIIS Travel Awards, 2008

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Ana Maria M. Suzuki



In the summer of 2008, after been fortunately awarded with the Student Travel Grant, I had the opportunity to participate for the first time in the IEIIS meeting.

The enchanted city of Edinburgh was especially lively at that time with many different people and cultures. This explosion of energies blended together with the exciting meeting of Endotoxin, making it unforgettable.

During the meeting, I could watch diverse and brilliant presentations of interesting findings, such as NALP3 activation by lysosomal damage, detailed aspects of TLR

complexes formation and mechanisms of innate immune evasion, among others.

Currently, at my last year of PhD course, I am investigating the relationship between TLR ligands and drugs related to gingival overgrowth, such as cyclosporin and phenytoin. The understanding of the effects of these drugs on oral tissue inflammation represents a challenge that can elucidate important aspects of the disease onset. Besides that, a wider approach of this interaction could also clarify some points of innate immune modulation. Thereafter, attending the IEIIS meeting helped me assimilate new information that is greatly contributing to my research life.

Øyvind Bakken Rognstad

First of all I would like to thank for the travel grant I was awarded.



I found Robin Ingall's presentation about site-specific innate immune responses to Chlamydia very interesting.

I find the changes of gene expression that occur in bacteria in response to the host environment very fascinating. The inclusion of patient material in research is very relevant in research. I would also like to emphasize that her presentation was very pedagogic, and it was easy to follow her story.

Urinary tract infections are frequent, and sometimes chronic. In order to

survive the bacteria must have a way to scavenge iron. Properties of iron scavenging in uropathogenic e.coli has been my focus area, and the way these bacteria evolve to thrive in a environment with scarce resources is impressive.

The picture I have attached is of me on a mountain trip

Best regards, Øyvind Bakken Rognstad

## President's Message

(Continued from previous page)

The **Frederik B. Bang Award** was established by the Stanley Watson Foundation "to recognize a substantial body of significant research accomplishment by an outstanding senior investigator, whose contributions to the endotoxin field extend over many years". While the Bang Award is selected by the Bang Award Committee, suggestions of names for their consideration can be sent to Nancy Pollman who will forward these nominations to the Bang Committee.

**Young Investigator Awards** provide recognition for early career stage investigators. These will be given to pre- or postdoctoral students who are less than 35 years old for presentation of outstanding posters. Nominations for this award must be made by the nominee's research advisor.

Travel awards for post-doctoral fellows and graduate students who submit abstracts will be considered. At the time of abstract submission students should indicate that they wish to apply for a trainee award. Only IEIIS members are eligible for Young Investigator and travel awards, so for those members who might have graduate students/post-doctoral fellows submitting abstracts, I would strongly encourage them to join the society. They can do so on our website and the dues are quite a deal (\$15 for students, who are considered anyone below the rank of assistant professor)! Detailed information on poster formats will be available online in late July.

Recently the publishers of *Innate Immunity*, the Society's sponsored journal, agreed to increase the number of pages per

issue. This will enable faster publication of accepted articles. Thanks to Otto Holst's superb leadership, the journal has increased its impact factor and has attracted increased manuscript submissions. In order to cover the added expenses of printing more pages, *Innate Immunity* will be instituting modest page charges. This was decided after a survey of previous contributors who stated that they would have been willing to incur page charges if it hastened publication of their articles.

As always, I welcome any questions, suggestions or advice from our members. I look forward to greeting each of you in October.

Warm regards,

Alan Cross, President of IEIIS

# Pleasure and Fruits of Interdisciplinary Collaboration in Endotoxin Research

by Shoichi Kusumoto

*I would like to dedicate this short article to late Prof. Kotani who gave us the first chance to join the research field of immunostimulating bacterial cell components and to Dr. Masaru Inage who was my first doctoral student and made an outstanding contribution to the initial step of our synthesis. He was unfortunately involved in a serious railway accident near Osaka and passed away in 2005.*

One afternoon of late fall in 1972, Prof. Tetsuo Shiba and I sat in the office of Prof. Shozo Kotani, a microbiologist at the same University. He told us that cell wall peptidoglycan ubiquitously occurring in all bacterial cells enhances the immunological responses of higher animals. We accepted his request for a collaboration by synthesizing several compounds corresponding to partial structures of peptidoglycan and soon succeeded in identifying N-acetylmuramyl-L-alanyl-D-isoglutamine (muramyl dipeptide, MDP) as the smallest immunostimulating structure of peptidoglycan. Though the same conclusion was independently reported by the group of Edger Lederer of CNRS even slightly earlier than us, the result was an important lesson which told us that a certain definite structural part can represent the function of the entire macromolecular glycoconjugate. We also learned that organic chemistry can contribute to solving important biological problems by providing with homogeneous key molecules free from any possible contamination from natural sources.

While working on peptidoglycan, we came to know a more interesting cell wall component, "endotoxin". Though ninety years had already passed since Richard Pfeiffer first described it in 1882, endotoxin was not well known among organic chemists. Its potent and multiple biological activities and complex and yet ambiguous chemical structure made endotoxin a highly attractive target of chemical endeavor. During the long research history on the structure and functions of endotoxin, several epoch-making contributions were made by Otto Westphal and Otto Lüderitz at the Max Planck Institute, Freiburg, Germany. They elaborated an efficient method of extraction of bacterial cells by hot aqueous phenol, which affords protein-free lipopolysaccharide (LPS). They then showed that mild acid hydrolysis of LPS liberates its lipophilic component, named lipid A, which exhibits all the biological functions of endotoxin including both detrimental and beneficial activities. Further new knowledge on the structure and functions of lipid A came out from the group of Lüderitz and Ernst Rietschel of the same institute: the chemical structure of lipid A isolated from *Salmonella minnesota* R595 mutant was deduced to be an *N,O*-polyacylated 1,4'-bisphosphorylated (1-6) glucosamine disaccharide. The latter phosphorylated disaccharide was referred to as the hydrophilic backbone of lipid A. Though the exact number and locations of fatty acyl groups on the backbone were not determined, we felt the above rough structural information was already sufficient for the start of our synthesis.

When we solved several difficult problems and completed the multistep synthesis of the first target, i.e., 2,2'-*N*- and 3,4,6'-*O*-acylated disaccharide bisphosphate, we contacted Dr. Lüderitz at

Freiburg and asked him to test our synthetic specimens for biological activity. We thereby expected everything would be correctly done there because they certainly had the highest level of knowledge, information, and techniques to study endotoxin. This contact fortunately led to the start of good and long term collaboration between the two groups, but still some more time was required until we were to reach a happy end to the story. Namely, contrary to our expectation, none of our synthetic preparations showed definite endotoxic activity. We had to conclude that something was wrong in our synthesis. Having compared natural lipid A and the synthetic molecule, we recognized that their physicochemical properties and hence their chemical structures were different.

It then seemed to be essential to purify the main component of natural lipid A and determine its precise structure until with the exact number, location and chain length of individual acyl groups. Lipid A obtained from *Escherichia coli* Re mutant was used for this analysis according to the advice of Dr. Chris Galanos of Freiburg who knew this bacterium produces a rather homogeneous lipid A. The main component of lipid A was successfully isolated in a pure state after some chemical modifications and chromatographic purification. Chemical as well as detailed spectroscopic analyses by the latest NMR and MS techniques led us to conclude the complete structure of *E. coli* lipid A. Whereas the previously proposed structure of the hydrophilic backbone was correct, the position of acylation had to be revised. We believed this was the first complete structural elucidation of lipid A, but again another research group, that of Nilofer Qureshi and Kuni Takayama at Wisconsin, independently, and possibly even a bit earlier than us, reported the identical structure for lipid A of a heptoseless mutant of *Salmonella typhimurium*. They isolated this component by repeated HPLC purification and determined the structure with the aid of NMR and MS analyses.

In any case, the goal of our investigation, i.e., synthetic reproduction of endotoxic compound, seemed to be already very close. The first synthesis according to the new information was started and completed in November 1983. The purified product was sent to Freiburg and, this time, proved to show the expected endotoxic activity. This was the first synthetic and endotoxic lipid A obtained one hundred and one years after the discovery of bacterial endotoxin. We still exactly remember this exciting and happy moment. Now, no one could oppose the idea that lipid A is the endotoxic principle of LPS. Various structural analogues of lipid A were then isolated from various bacterial cells and some have been synthesized. Some of the synthetic lipid A was distributed among many research

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## Pleasure and Fruits

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groups for very fine experiments and have served as a certain standard. The relationships among chemical structures, biological activities, and physicochemical properties of lipid A were well documented.

The community of endotoxin researchers is, as I felt, quite tolerant and open to newcomers and because of this comfortable atmosphere I already have spent a few enjoyable decades. Endotoxin research is by itself a multidisciplinary science covering microbiology, immunology, biochemistry, medicinal science to

biophysics, so that anyone may join freely in making an important contribution. We were really lucky just to have come on a right stage of the development of the research and able to do something to the field. After the discovery of Toll like receptors around the end of twentieth century, our understanding of innate immunity system was very much improved. Even under this situation, I believe endotoxin research, because of its multidisciplinary nature, ever expands in various, even unexpected, directions, to the great benefit of human beings.



## 2010 Joint Meeting between the Society for Leukocyte Biology & the International Endotoxin and Innate Immunity Society

### “The Three Rs of Immunity: Recognition, Response and Resolution”

October 7-9, 2010

The Fairmont Hotel Vancouver, BC, Canada

**Attention IEIIS members:** Be sure to use your discount code sent via email to receive the member pricing! Please email [slbieiis2010@faseb.org](mailto:slbieiis2010@faseb.org) if you need the code, or [IEIIS@aol.com](mailto:IEIIS@aol.com) to confirm your current membership status.

### Organizers:

William M. Nauseef and Neil Reiner, SLB  
Alan Cross and Steve Opal, IEIIS

### Featuring Keynote Speaker:

Steven Holland “Lessons in Innate Immunity from Patients with Rare Clinical Disorders”

### Scientific Program:

The program committee has put together a tremendous scientific program including keynote speaker Steven Holland, NIH and Plenary Speakers, Joe Garcia, Stephen Lowry, Robert Munford, Steven Opal, Siamon Gordon, Jenny Ting, Jerrold Weiss, Timothy Billiar, Megan Levings, Charles McCall, Jeff Hasday, Charlie Serhan, Michele Swanson, Ed Abraham and Stefanie Vogel. There are also 38 wonderful Concurrent Session speakers and over 20 selected talks which will be determined from submitted abstracts. To view the full preliminary program, go to [www.slbieiis2010.org](http://www.slbieiis2010.org).

### Social Program:

The social program promises to help you explore the beautiful city of Vancouver with the Welcome Reception on Thursday, October 7th from 6:30 - 7:30 PM at the Fairmont Hotel Vancouver. Light fare and refreshments along with wine/beer will be hosted at this event. There will also be the Student/Post-doc mixer planned for Thursday, October 7th from 9:00 - 11:00 PM at the The Uber Lounge at Steamworks Brewing Co. for our Junior registrants. Light fare (appetizer variety plus pizza) will be provided at this event. A cash bar will be available.

### New IEIIS Members

**Julie Blander, PhD**

Mount Sinai School of Medicine  
New York, NY USA

**Catharine Bosio, PhD**

National Institutes of Health  
Hamilton, MT USA

**Edward K Chan, PhD**

Univ of Florida  
Gainesville, FL USA

**Christopher Coates, BSc**

Stirling, Stirlingshire UK

**Timothy Cornell, MD**

Univ of Michigan  
Ann Arbor, MI USA

**Chiguang Feng, PhD**

Univ of Maryland, Baltimore  
Baltimore, MD USA

**Fumito Hanihara**

Tohoku Univ  
Sendai, Miyagi JAPAN

**MD F Hassan, PhD**

NIDCD/NIH  
Rockville, MD USA

**Mohammed Hezwani, BSc**

Bristol, Avon UK

**Lauren Hittle**

Univ of Maryland, Baltimore  
Baltimore, MD USA

**David Huhtelin**

Univ of Iowa  
Coralville, IA USA

**Susanne Keese**

Research Centre Borstel  
Borstel, Schleswig-Holstein  
GERMANY

**Qingke Kong, PhD**

Biodesign Institute  
Tempe, AZ USA

**Franziska Kopp**

Research Center Borstel  
Borstel, Schleswig-Holstein  
GERMANY

**Matam Vijay-Kumar, PhD**

Emory Univ  
Atlanta, GA USA

**Adriana Larregina, MD, PhD**

Univ of Pittsburgh  
Pittsburgh, PA USA

**Jie-Oh Lee, PhD**

KAIST  
Daejeon KOREA

**Bernd Lepenies, PhD**

Max Planck Institute of Colloids & Interfaces  
Berlin GERMANY

**Ann Marie LeVine, MD**

Univ of Michigan  
Ann Arbor, MI USA

**A Nahid, MS**

Univ of Florida  
Gainesville, FL USA

**Brittany Needham, BS**

Univ of Texas at Austin  
Austin, TX USA

**Ines Niehaus**

Krohnshagen, Schleswig-Holstein  
GERMANY

**Pavel Okorokov**

Russia State Medical Univ  
Moscow RUSSIA

**Francesco Peri, Professor**

Milano ITALY

**Matteo Piazza**

Univ of Iowa  
Coralville, IA USA

**Daniel Powell, BS BA**

Univ of Maryland, Baltimore  
Baltimore, MD USA

**Girish Ramachandran, PhD**

Univ of Maryland  
Baltimore, MD USA

**Anke Scultetus, MD**

Naval Medical Research Center  
Silver Spring, MD USA

**Anju Singh, PhD**

Albany Medical College  
Albany, NY USA

**Keita Takahashi**

Gifu Pharmaceutical Univ  
Gifu JAPAN

**Anthony Vella, PhD**

Univ of Connecticut Health Center  
Farmington, CT USA

**Gregory Vladimer**

Univ of Massachusetts  
Medical School  
Worcester, MA USA

**Dr. Alla Zamyatina**

Univ of Applied Life Sciences  
& Natural Resources  
Vienna, AUSTRIA

**Kol Zarembor, PhD**

NIAID/NIH  
Bethesda, MD USA

**Mateja Zorko, PhD**

National Institute of Chemistry  
Ljubljana SLOVENIA

# Nominations for IEIIS Office 2010-2012

(Continued from page 1)

(Vote for one in each category)

**President-elect:** Egil Lien (USA)  
Jerrold Weiss (USA)

**Secretary:** Andra Schromm (Germany)  
Tim Sellati (USA)

**Treasurer:** Dan Rossignol (USA) - *by acclamation*

**Inl Editor-in-Chief:** Otto Holst (Germany)

**IEIIS Newsletter/**

**Webmaster:** Richard Tapping (USA) - *by acclamation*

**Membership:** Chris Hodgson (UK) - *by acclamation*

**Scientific Councillors:** (Vote for one in each category)

Chemistry: Martine Caroff (France); Jie-Oh Lee (S. Korea)

Immunology: Holger Heine (Germany); Susu Zughaiyer (USA)

Microbiology: Ben Appelmelk (Netherlands); Amy Hise (USA)

Pathology: Bow Ho (Singapore); Shin-ichi Yokota (Japan)

The runner up in each of the Scientific Councillor categories will take the seat for that category on the Scientific Program Committee, which assists with the planning of the next biennial meeting, to be held in 2012.

*\* The electronic ballot will take 5 minutes (or less!) \*  
Please take an active role in your Society  
by returning your ballot when it arrives without delay*

*For memberships, renewals, and subscriptions, visit our website*

**www.IEIIS.org**

## Where to Ask ...

Need to update your address information? Want to pay your dues but are not sure how? You can get answers to these and all other questions related to your IES membership from the following individuals:

Email us at **info@ieiis.org** or contact one of these individuals directly:

Membership:

Dr. J. Chris Hodgson (UK)  
IEIIS Membership Chairman  
Phone: 0131 445 5111  
Fax: 0131 445 6111  
Email: Membership@ieiis.org

Change of address:

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Email: Secretary@ieiis.org

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## Additional Emails Also Available

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To contact the Society for any inquiry, or to update contact information, write us at:

**IEIIS@aol.com**