

Swiss Group for Mass Spectrometry
Schweizerische Gruppe für Massenspektrometrie



Groupe suisse de spectrométrie de masse
Gruppo svizzero di spettrometria di massa

Newsletter

2010 SGMS Meeting

November 4 and 5

Dorint Resort Blüemlisalp

Beatenberg

Plenary lectures:

Catherine E Costello	Boston University School of Medicine
Jyotsna Sharma	Texas Tech University
Andrej Shevchenko	Max Planck Institute, Dresden
Jean-Luc Veuthey	University of Geneva and Lausanne

SGMS General Assembly 2010

Dorint Resort Blüemlisalp

Thursday November 4, ~17:20

We hope that many people will attend our General Assembly following the afternoon session. During the apéro and the "Dinner Buffet" we will have plenty of time for discussions. As usual latest news will be served at the bars.

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President's Report 2009

This year the SGMS, together with the French and Italian MS Societies submitted a bid for hosting the 20th International MS Conference in Geneva. The bid was accepted by the national affiliates of the International MS Foundation at their meeting in Bremen on August 30th. At that time it was also decided to change from a tri- to a biennial meeting format, thus in fact advancing the 20th IMSC to 2014. The conference will be chaired by Prof Renato Zenobi (ETHZ) and co-chaired by Dr Marc Suter (Eawag). The Scientific Committee is composed of renowned mass spectrometrists from academia and industry.¹

Under the umbrella of the Conférence Universitaire de Suisse Occidentale (CUSO), SGMS was involved in organizing the PhD Summer School on "Frontiers in Mass Spectrometry", held in Villars-sur-Ollon, August 16-20 (<http://isic.epfl.ch/cusoms2009>). The Summer School attracted 70 participants from Switzerland and abroad. It gave a broad overview of the current state-of-the-art in MS methods and techniques, and covered applications primarily in the "hot" areas of life sciences research. Lectures were given by international top level scientists.

Together with the Centre de Compétences en Chimie et Toxicologie Analytiques (ccCTA) from the Lake Geneva Arch, the SGMS organized a LC/MS workshop prior to the 47th Annual Meeting of the International Association of Forensic Toxicologists held in Geneva, on August 23rd. Roughly 100 people attended and some lively discussions resulted at the end of this very attractive workshop.²

¹ (see <http://www.sgms.ch>).

² (see <http://www.tiaft2009.org/informations.php> for handouts of the talks).

The SGMS annual meeting took place October 29–30 at the Hotel Dorint Beatenberg. The 110 participants enjoyed a high quality scientific program, with four plenary lectures and 12 additional contributions.

Prof Jokela (ETHZ / Eawag, CH) opened the conference explaining us, why nature needs males, or sometimes can do without. Prof Bowers (UCSB, CA, US) then showed how peptides aggregate, causing amyloid fibril formation, a primary cause of e.g. Alzheimer's disease. On Friday morning Prof Eberlin (UNICAMP, Campinas, BR) then explained how analytes can be desorbed at atmospheric pressure without the need of elevated temperature and high voltage. Many forensic applications made this a very entertaining presentation. The last invited lecture was held by Dr Stöcklin (Atheris Laboratories, Geneva, CH) who presented some highly toxic denizens of the world, from spiders to snails. The use of venomics for drug discovery was illustrated, but what really amazed the audience was the video of a snail catching an unsuspecting fish, using a toxin and a harpoon like device.

The SGMS continued the tradition of sponsoring the participation of students at the Beatenberg meeting. This year's awardees were Stefanie Mädler and Liang Zhu (ETHZ), Susanne Kern and Holger Nestler (Eawag), and Carine Steiner (University Hospital ZH).

The Thursday afternoon session was followed by the 2009 General Assembly of the SGMS. During this occasion, former President Dr Andreas Stämpfli (F. Hoffmann-La Roche AG), Secretary Thomas Läubli (CTC Analytics AG) and Treasurer Dr Hanspeter Moser (Novartis Pharma AG) were elected honorary members of the SGMS, for their service to the SGMS. It was further announced that MS Noise.com and Jeol have joined the SGMS as newest sponsors. After the general assembly, the participants met for an aperitif, followed by a delicious dinner buffet, and a wrap-up in the Muh Bar.

Dr Marc J-F Suter, President SGMS

Mass Spectrometry-based Methodologies for Investigations of N- and O-linked Glycans and Their Effects on Assembly and Interactions of Cells and Organisms



Catherine E Costello

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Mass Spectrometry Resource
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The glycosylation status of cell surface proteins and lipids influences interactions of individual cells and even whole organisms, with one another and with the environment. For example, epithelial cellular adhesion *via* adherens junctions is mediated by multi-protein complexes. Similarly, cell-surface carbohydrates provide critical signals that govern expansion of tumors and activation of growth factors. Assembly of multimers of P0 protein, a major component in myelin is dependent on its glycosylation. Furthermore, changes in cell surface glycosylation, either species-specific or due to genetic mutations, cause changes in each system's susceptibility to microbial infection. We are developing new and improved methods, centered on MS, for detailed structural determinations of glycans and glycoconjugates present as components of these complex mixtures. We are investigating new methods for glycan structural determinations and are utilizing glycomics and proteomics-based approaches to define glycan-dependent interactions and to correlate changes in the phenotypes of individual cells and whole organisms with degrees of glycosylation and differences in glycans.

Acknowledgements: NIH National Center for Research Resources and National Heart Lung and Blood Institute.

Orchids: models of biological complexity



Jyotsna Sharma

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Orchidaceae is one of the largest and most highly evolved plant families. Although approximately 70% of the orchid species are of tropical origins ranging in size from a few centimeters to several meters, the rest are native to the temperate and even arctic regions of the planet inhabiting most all natural ecosystems except for the driest deserts. A majority of the tropical and subtropical orchids grow as epiphytes, i.e., growing on top of other plants, whereas those in the temperate regions tend to grow terrestrially and include several non-photosynthetic species. There is at least one known subterranean orchid species. This wide diversity and evolutionary success of orchids is a result of an array of very complex, and often very specific, biological and ecological strategies employed by these organisms. Their highly specialized floral and vegetative structures, pollination mechanisms involving sophisticated chemistry, cryptic growth habits, root morphology, and unique reliance on mycorrhizal fungi are just some of the characteristics that make them outstanding, although challenging, models for studying complex biological interactions and even motivated Darwin to exclusively study their biology. Orchids continue to intrigue commercial and biological explorers alike. One of the highly distinctive features of orchids is their specialized interaction with mycorrhizal fungi. These interactions can range from complete dependence on fungi throughout the life of an orchid to heavy

reliance only during certain life-stages or very little reliance on fungi beyond the fully heterotrophic, seed germination stage. Orchid fungus interactions also can either be highly specific or relatively general. Given that up to 30,000 species are estimated to belong to the Orchidaceae, a number of ecological strategies appear to exist among orchid mycorrhizae. However, all orchid fungi identified this far fall into select fungal taxonomic groups only. This presentation will highlight some examples of the intricate orchid-fungal interactions and their consequences for biodiversity. We seek to understand whether fungal distribution determines orchid distribution in natural habitats, and whether the associations of orchids and their fungi are specific or general. Overall, orchid mycorrhizae are relatively underexplored, and there is especially a need to understand their distribution, inter-dependence, and communication mechanisms.

Shotgun lipidomics for cell biology and molecular medicine



Andrej Shevchenko

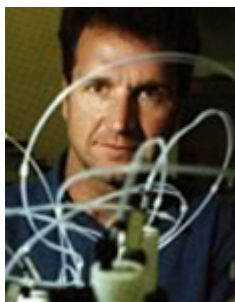
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Lipidomics, an emerging branch of the omics sciences, aims at cataloguing and quantifying the total lipid complement synthesized by a cell, tissue or organism. Shotgun analysis of the lipidome implies that total lipid extracts containing hundreds of molecules from different lipid classes, are directly infused into a tandem mass spectrometer and thousands of MS and MS/MS spectra are acquired in a single run. Individual molecular species are recognized and quantified using their accurately determined masses and characteristic structural fragments.

Shotgun lipidomics approach is appealing: it is rapid, comprehensive and easy to set up at any tandem mass spectrometer. Quantification of lipid species does not involve time-integration because the same analyte is infused into a mass spectrometer. There is ample time to achieve good ion statistics even for minor peaks and the ionization conditions can be tuned to enhance the sensitivity towards barely detectable lipid classes. There is no carry-over between samples and the entire process can be completely automated. Shotgun lipidomics set up at the same instrumentation platform supports both high- throughput clinical screens and targeted characterization of molecular lipid species from a variety of model organisms from bacteria to humans. However, two major bottlenecks of the shotgun approach are in the

limited dynamic range and possible ionization suppression of certain species and in the consistent interpretation of exceedingly complex spectra datasets. We argue that high resolution tandem mass spectrometers together with the dedicated data interpretation software could overcome these hurdles and support a broad scope of research efforts in cell biology, molecular medicine and nutrition science.

***Capillary electrophoresis and
Ultra high pressure liquid chromatography
hyphenated with MS in pharmaceutical analysis***



Jean-Luc Veuthey

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In the last ten years, a strong development has emerged in Capillary electrophoresis (CE) and in Liquid Chromatography (LC) to achieve fast, ultra-fast and highly efficient separations in the pharmaceutical field. In the same period of time, Mass Spectrometry (MS) with different analyzers became the best complementary tool to separation techniques, to further gain selectivity and/or sensitivity, when dealing with complex matrices (e.g. biological fluids and plant extracts).

The use of large bio-molecules is increasing in pharmacy. Therefore, there is a need for efficient analytical techniques for determining these compounds (e.g. proteins). The on-line combination of capillary electrophoresis (CE) with mass spectrometry (MS) is an attractive option for intact protein analysis (i.e., no digestion, no derivatization). On the one hand, CE presents features such as high speed, great efficiency, and low solvent and sample consumptions. Moreover, CE allows working under aqueous conditions and without stationary phase. On the other hand, MS provides selectivity and ability to identification. TOF (time-of-flight) analyzer is particularly well suited to protein analysis, due to high mass range and mass accuracy. For small charged molecules, CE-MS with a simple quadrupole is also a powerful

orthogonal analytical tool to LC-MS. Different examples will be given to illustrate the potential of CE-MS in the pharmaceutical domain.

In LC, various analytical strategies have been reported for enhancing the chromatographic performance, such as the use of monolithic supports, high temperature, fused-core particles and sub-2 μ m particles working under very high pressure (UHPLC). Among the proposed approaches, it has been demonstrated that UHPLC and fused-core particles presented several advantages for the analysis of small molecules as well as large bio-molecules. Therefore, UHPLC-MS with different analyzers can be used to analyze very complex matrices with compounds present at low concentration. The possibilities offered by UHPLC at high temperature (i.e. HT-UHPLC) to further enhance chromatographic performance will be also discussed. Finally, UHPLC-MS/MS and UHPLC-TOF-MS can be attractive in ADME studies at an early stage of the drug discovery process.

Minutes of the 2009 General Assembly of the Swiss Group for Mass Spectrometry

Dorint Resort Beatenberg, 24. October 2007 – 16:49

Agenda

1. **Nomination of the scrutinizers**
Richard Knochenmuss and Christian Guenat are elected by all members present.
2. **Approval of the minutes of the 2008 general assembly**
The minutes are approved unanimously.
3. **President's report and its approval**
Marc Suter, the president, presents the report of 2009 which is approved by all members.
4. **Treasurer's report**
Stephan Brombacher, our treasurer informs us about the current status of our accounts:

	Postal Account	Banking Account	Total
Assets per Oct. 1 st , 2008	26'749.74	27349.71	59'099.45
Revenues	33.35	44'082.55	44'115.90
Expenses	18.85	36'952.03	36970.88
Assets per Sept.30 st , 2009	26'764.24	34'480.24	61'244.48
Surplus revenue	14.50	7'130.52	7145.02

5. Auditor's report and approval of treasurer's and auditor's report

Andreas Topp and Peter Oggenfuss have checked the treasurer report. Andreas Topp reads the auditor's report

The treasurer's report is accepted and approved by all members. Andreas Topp and Peter Oggenfuss have both accepted to be auditors again.

6. Decision on the 2009 membership fee

The membership fee for 2009 remains at CHF 25.00 per year and member.

This is accepted by all members present.

7. Admission of new members

Dr. Nicolas Fraysse, Thermo Fisher Scientific (Schweiz) AG

Thomas Frey, Brechbühler AG

Guy Krafft, Kantonsspital Bruderholz

Dr. Luc Alexis Leuthold, Novartis AG

Dieter Meierhans, Labor Veritas

Réjane Morand, University Hospital Basle

Dr. Serge Rudaz, University of Geneva

Dr. Imelda Schuhmann, Biofocus DPI AG

Dr. Guido Vogel, Mabritec AG

Guido Wahl, DSM Nutritional Products

Dr. Patrice Waridel, University of Lausanne

Andreas Stämpfli, Thomas Läubli and Hans-Peter Moser were elected honorary members by acclamation.

8. News from the SCS

Marc Suter explains the role of the Swiss Chemical Society.

The SCS has about 2500 members and is divided into 5 Divisions. It is the largest professional body of chemists in Switzerland. The SGMS is an associated member of the SCS.

9. The SGMS homepage

The "jobs" page is the most visited on the homepage. A total of 36 job openings mainly in Switzerland and Europe have been posted on this site since the 2008 meeting.

10. IMSC Bid 2015 and news from the IMSF

Geneva was selected as host city of the 20th IMSC, which will be taking place at the "Centre International de Conférences Genève (CICG)".

The committee is assisted in the conference organization by Corporate Communications of ETH Zürich, a professional event organizer.

The conference is supported by the Swiss Chemical Society, Academia, industry and three of our neighboring countries are represented on the scientific committee.

11. Individual proposals

None.

12. Miscellaneous

The TIAFT was a very well visited conference. 450 participants from 60 countries have attended this meeting. The LC/MS workshop which took place on Sunday had roughly 100 participants

Yury Tsybin informs us, that he organizes a European FT-MS conference in Lausanne, April 6-9, 2010.

The next SGMS Meeting will be taking place at the same location (Beatenberg) on November 4./5., 2010.

Marc Suter, Yury Tsybin, Jean-Luc Wolfender, Stephan Brombacher, Laurent Bigler, Andreas Stämpfli and Matthias Herzog are re-elected by all members present.

The General Assembly closes at 18:28

Beatenberg, 29.10.2009

Matthias Herzog

A handwritten signature in black ink that reads "M. Herzog". The signature is written in a cursive style with a long, sweeping underline.

Secretary of the SGMS

SGMS Meeting 2010, November 4 and 5

Dorint Resort Blüemlisalp, Beatenberg

Next to the plenary lectures there will be time for several oral communications from various participants. The time allotted will be 20 minutes. Please allow some minutes for discussion. The **abstract** incl. author's name and address should be sent **latest by Friday August 6, 2010** directly to the SGMS by e-mail (marc.suter@eawag.ch). The abstract should not exceed 2500 characters.

Please note that the lecture hall is equipped with PC projection facilities only. To avoid technical problems everybody will be using the PC provided by the organizers (no personal laptops or MACs allowed). Only presentations prepared or saved as Microsoft Office Power Point 2003 will be accepted.

In preparing your presentation, please consider that your presentation has to be formatted horizontally and remember the dictum "less is more". To obtain clear slides, consider the differences between the size of your office and that of an auditorium for 120 people. The attendants sitting in the last row also have the right to read the contents of your slides without any problem. Test your slides on readability.

Registration and Accommodation:

Please, send your registration (only completely filled in forms!) to sgms@brechbuehler.ch not later than October 1st, 2010. Either PDF by email or filled in printed form by ordinary mail will be accepted.

There is absolutely no need to register personally at the Dorint Resort Blüemlisalp! The SGMS committee will again manage the hotel reservation and payments. Only the "extras" will have to be paid directly at the hotel-reception (like: extra nights, phone-calls, muh-bar, mini-bar ...).

We will strictly follow a first come first serve policy for the distribution of the hotel rooms (~110 rooms available!).

Registration fees including Hotel accommodation, business lunch, dinner buffet and breakfast and social event:

CHF 275/ person (single room occupancy)

CHF 250/ person (double room occupancy; please indicate roommate)

CHF 200/ person (accompanying person; double room occupancy; please indicate roommate)

Late Fee: An additional late fee of CHF 50 will be enforced for all payments received after September 1, 2010. NOTE: to qualify for the regular rates payment MUST be received by September 1, 2010 - receipt of the registration form without payment will not qualify.

There is absolutely no possibility of attending the meeting without Hotel accommodation. Thank you for your understanding!

Please make your payment to

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Make sure that we can track your payment by ensuring that your name is clearly stated on the payment form. Every year we receive unidentifiable payments due to misleading information on the incoming payments!

Cancellations

Cancellation requests, received by e-mail before October 1st, 2010, will qualify for a refund of the fees paid, less a handling charge of 25% of the total payment. After October 1st, 2010, no refunds will be made; however, substitute participants can attend.

Notification of all such changes must be **sent to sgms@brechbuehler.ch** by e-mail **before October 16, 2010**. Changes will not be accepted at the meeting.

No show: No refund will be made.

Students support program:

Students giving a talk (selection by SGMS Board) will be hosted free of charge. For more information, please call any of the SGMS committee members.

Travel Information:

Travel details together with the complete program will be published on our homepage (www.sgms.ch) and sent out in September together with our official invitation.

SGMS Membership Fee:

Included in the mail is a pink payment form for the annual membership fee of 25 Fr. Please write your name in the comment field!

UBS Switzerland BCL: 292, 10722181.0

IBAN: CH88 0029 2292 1072 2181 0

SWIFT: UBSWCHZH40M

You are kindly asked to pay this fee as soon as possible.

2010 General Assembly of the SGMS

Thursday November 4, 2010

time to be announced

Dorint Resort Blüemlisalp, Beatenberg

Agenda

1. Nomination of the scrutineers
2. Approval of the minutes of the 2009 general assembly
3. President's report and its approval
4. Treasurer's report
5. Auditor's report and approval of treasurer's and auditor's report
6. Decision on the 2010 membership fee
7. Admission of new members
8. Election of the president and committee members
9. IMSC2014
10. News from the IMSF and EMS
11. The SGMS homepage
12. News from the SCS
13. Individual proposals
14. Miscellaneous

Individual proposals must be sent to **marc.suter@eawag.ch** before **October 21, 2010**.

The President, Marc Suter

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