MetaboNews

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In This Issue

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MetaboNews is a monthly newsletter published in a partnership between The Metabolomics Innovation Centre (TMIC) and Metabolomics Society.

Metabolomics Society News

Conference Corner

Dear Colleagues and Metabolomics Enthusiasts,

It is now 3 months to Metabolomics 2021 Online, and on behalf of the Metabolomics Society we would like to cordially invite you to Metabolomics 2021 Online, the 17th Annual Conference of the Metabolomics Society, which will run from Tuesday, June 22 to Thursday, June 24. You can now register via the conference website, metabolomics2021.org, and we encourage you to visit the website for a peek at the fantastic program and to not miss any updates. Below are a few updated highlights that we would like to make you aware of:

- We have now confirmed several international high-profile keynote speakers, including: Theodore Alexandrov, Koel Chaudhury, Rachel Kelly, Du Toit Loots, Peter Meikle, Carina Mels, Emma Schymanski, Alessandra Sussulini, Yulan Wang, and Bing Yu. We are excited that this panel of speakers is even more diverse in terms of both science and geography than our past meetings.
- Shortly, we will be announcing the series of interesting Workshops and Sponsor Studios to be held on day one of the conference.
- Abstracts for poster presentations are due **May 7** and can be submitted via the conference website.

Talks are organized in three thematic streams: Health, Technology, and Environment, meaning there will be talks for everyone. As last year, the agenda will run in the "Live Aid" model with sessions around the clock, so there will always be talks that are convenient for you to watch. In addition, talks will be recorded and available within 2 hours after each session, so you do not have to get up in the middle of the night to watch your favorite session.

Metabolomics 2021 Online is a complete conference with all the features and benefits that you've come to expect from us. As such we are charging a modest registration fee this year (as do all other online conferences). All current members of the Society (at the time of the conference) will receive discounted conference registration fees.

Metabolomics 2021 Online is your unique chance to connect to everyone in this second year of the pandemic and experience metabolomics surrounded by friends and colleagues. Come join us!

For more updates on the conference stay tuned for the next issues of MetaboNews and the email announcements of the Metabolomics Society. Visit us at www.metabolomics2021.org for more details, to register, and to submit your abstracts.

We are looking forward to seeing you all at Metabolomics 2021 Online.

Metabolomics Society News

The Metabolomics Society is an independent non-profit organisation dedicated to promoting the growth, use and understanding of metabolomics in the life sciences.

General Enquiries
info@metabolomicssociety.org
Membership Enquiries

Horst Joachim Schirra
Chair, Metabolomics Society Conference Committee

Members Corner

Early-career Members Network (EMN)

EMN Award 2021
The EMN is delighted to announce the opening of the EMN Award for 2021. This award aims to encourage active engagement in the field by supporting and recognizing outstanding achievements, offering more visibility and great prices to the awardees. (Up to 4 available)

Are you a graduate student or an early-career researcher? Are you planning to submit an abstract for the Metabolomics 2021 online conference? Then most of the job is already done!
Click here to know more about the submission process and the prices.

EMN Webinar Series
The EMN would again like to thank Prof. Assaf Vardi and Dr Guy Schleyer for their inspiring talks on chemical ecology combined with single-cell imaging and transcriptomic approaches.

Save the date! The next Webinar organized by the EMN will be hosted on April 27th 2021, at 14:00 UTC. The EMN is looking forward to welcoming Dr. Maria Eugenia Monge and Nicolás Zabalegui, who will present a Python-based tool to read, process and visualize MS data generated in untargeted metabolomic studies as well as strategies to improve the overall data quality.
Stay tuned for more details on the Webinar and how to register!

New Expert Opinion
The new Expert Opinion is now published on the EMN Wiki page, and it is a real pleasure to read the inspiring answers from Prof. Pieter Dorrestein. He shared with us his work and, of course, his experiences with GNPS and the challenges related to microbiome characterization. Follow the link to find out more.

Metabolomics Society News

Membership News for 2021

The Metabolomics Society Membership Committee is excited to officially announce a new affiliation with the Latin American Metabolic Profiling Society (LAMPS). The LAMPS is a young network that seeks to strengthen collaborations across the Latin American region, promote emerging technologies and practices that help to make science more reproducible and open. The affiliation will aid in highlighting metabolomics research from the Latin America region and enable global collaborative and training opportunities. The Committee anticipates that this affiliation will increase membership from this region, which is one of the goals of the Metabolomics Society's 2020-2025 Strategic Plan for Membership Retention and Expansion, and provide greater representation of Latin America members within the Society. Finally, we would like to thank Drs. Elaine Holmes and Christina Jones for their early efforts to establish this affiliation.

For more information about our newest affiliate, LAMPS, please see https://jwist.github.io/lamps/

LAMPS

International Affiliates Corner

Metabolomics Association of North America (MANA)

Visit https://metabolomicsna.org

The MANA **WomiX Interest Group** is excited to announce the next event in their **Images of Success: Women in Metabolomics** series. The next event is on Friday, Apr. 23, 2021, from 3 - 4 pm EST with the topic of **"The good, the bad, and the ugly of working in a metabolomics core."** Join us to hear from **Lauren Ashley Cowart, Ph.D.** from Virginia Commonwealth University (Core Director), **Yuanyuan Li, Ph.D.** from the University of North Carolina at Chapel Hill's Nutrition Research Institute (Core Manager), and **Belinda Willard, Ph.D.** from Cleveland Clinic Lerner Research Institute (Core Director). Register here!

MANA would also like to announce the formation of a new interest group, the **Metabolomics Cores Interest Group**, whose mission is to promote leadership and mentorship skills among members, navigate common challenges and barriers faced amongst core groups, and facilitate communication for MANA core members. During this group's first meeting, discussion topics included interest group workshop themes/topics for the MANA 2021 conference, standards of operation in open-access facilities and how to train users safely, and fee-for-services vs collaboration models, among other topics. In order to continue these discussions, **this group plans on holding a second virtual meeting in late May**. If you are interested in participating and joining the MANA Metabolomics Cores Interest Group, then please contact **Maryam Goudarzi** goudarm@ccf.org or **Kelly Paglia** kpaglia.ucd@gmail.com.

Commercial Spotlight | Afekta Technologies

SpOtlight

Food Metabolomics by Afekta Technologies

Metabolomics in Phytochemical Analysis of Foods

Phytochemicals have recently been coined the 'dark matter' of nutrition (1). They are small biomolecules produced by plants for their own different purposes, and they include flavonoids, lignans, phytosterols, certain vitamins, and many other classes of molecules, with up to hundreds of thousands different ones produced by the plant kingdom. Phytochemicals are presumably behind many of the health effects of plant-based foods and beverages (2), but there is limited knowledge and communication about the phytochemical content of various food products.

Metabolomics is a highly suitable tool for the analysis of phytochemicals owing to its capacity to cover a wide polarity and concentration range of compounds in a single analysis. Moreover, the high number and diversity of these compounds necessitates broad-scale profiling approaches, because it is not feasible to establish targeted analytical methods for all the phytochemicals present in any food – a single food can contain up to thousands of different chemical compounds, out of which a large proportion are phytochemicals with potential impact on our health. Modern LC-MS-based metabolomics techniques, with their high sensitivity, are able to capture most of the vast biochemical array present in plant-based foods (Figure 1) (3, 4).

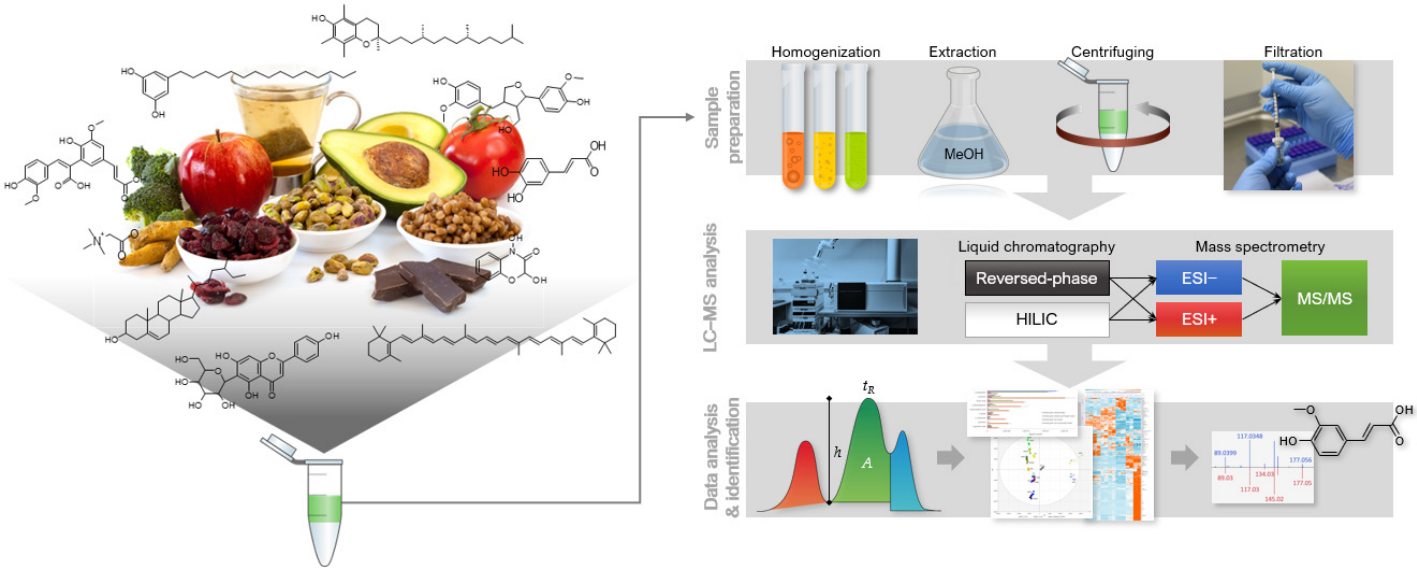

Figure 1. The principle of wide-scale phytochemical analysis with the LC-MS method. Image modified from Klåvus *et al.* 2020 (5).

For example, grain rootlets, which are removed and discarded from dried malt as a side stream of the malting process, may have significant antioxidative properties from phytochemicals (6). They could also cover the yearly protein intake for 4 to 5 million people if they were used as food instead of using it as animal feed. In a recent study investigating the effect of malting on the phytochemical content of different grains, 285 phytochemicals from 13 chemical classes were annotated utilizing a semi-quantitative LC-MS metabolomics method (7). Malting altered the levels of phytochemicals, with significant increases observed in the rootlet. It was found that whole grain cereals and their malting products were a rich source of phytochemicals and the study revealed previously unknown phytochemical compound classes in certain species. However, it is possible that the actual number of different phytochemicals in whole grains is higher by several fold.

Highlighting the Hidden Wonders of Plant-Based Foods

Afekta Technologies is a Finland-based metabolomics com-

pany, which was founded in 2017 as a spin-off from University of Eastern Finland, specializing in analysing phytochemicals from foods. The technology and methodology are based on high-end LC-MS instruments, a combination of reversed-phase and HILIC chromatography to encompass a wide analytical range, and a non-targeted metabolomics approach, which has been developed and utilized for the past decade (7).

Fytovore is a concept being developed by Afekta in which phytochemicals are analysed from food products to assess their quality in terms of the phytochemical and caloric content. With the help of Fytovore, it is possible to highlight the chemical diversity of plant-based food products with higher phytochemical content compared to other products in the same food category.

The current nutritional information tables of foods and beverages offer a solid overview of energy, protein, carbohydrates, fiber and vitamins, but does not report other bioactive, potentially beneficial compounds. Refinement techniques tend to reduce the amounts of bioactive compounds, such as phytochemicals, in the foods, and this is not reflected in the current nutritional information. In many cases, as illustrated in Figure 2, the only relevant difference between a highly processed product and a product containing whole plants may be the phytochemical content, which would be valuable information to communicate to the consumers. This is the main motivation behind developing Fytovore. Currently, there are over 400 phytochemicals in the food metabolomics database developed at Afekta for food sample analysis within the Fytovore project, and the list is rapidly expanding.

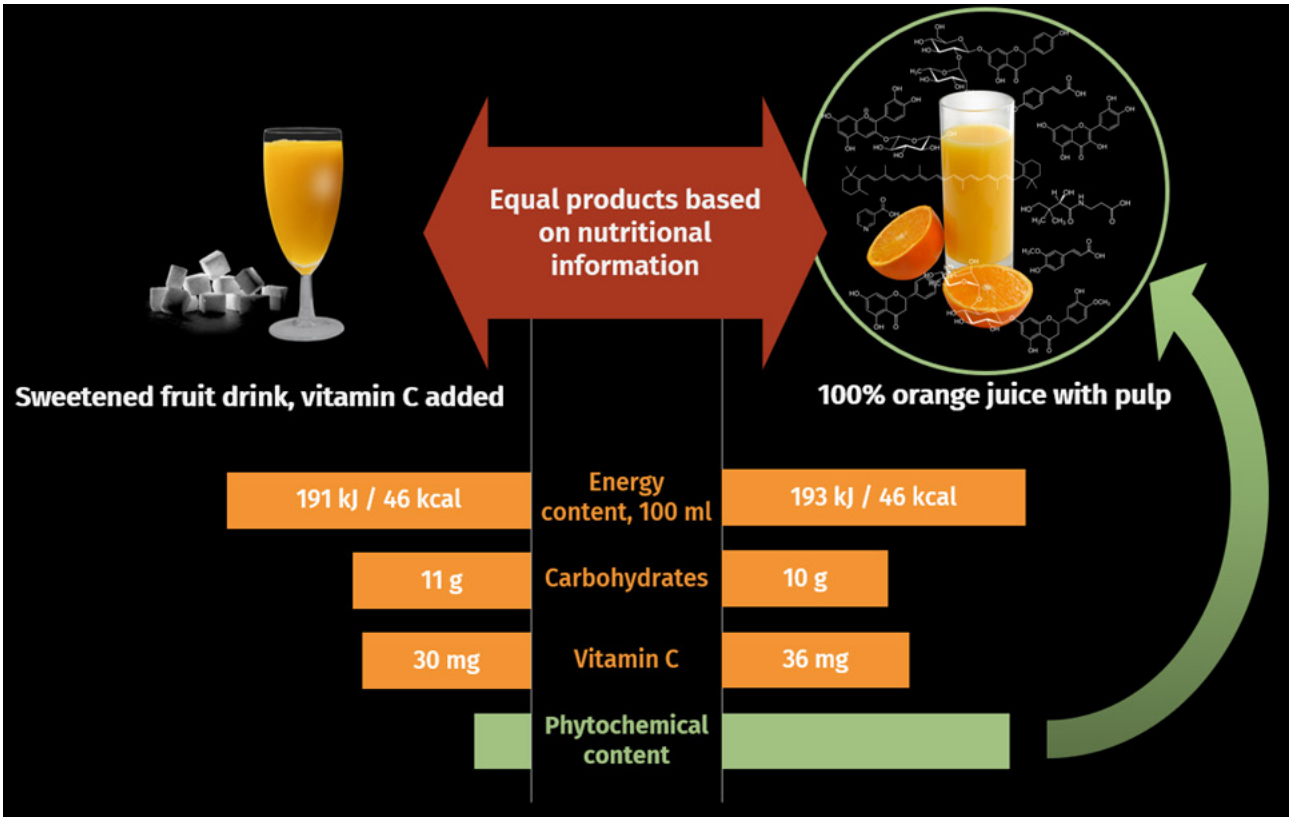

Figure 2. An example of two orange juice products with low and high fruit content but similar nutritional characteristics based on currently available product information (Source: Finnish Institute for Health and Welfare). The analysis of the relative abundance of phytochemicals in the samples (Source: Afekta Technologies) clearly reveals the difference between the two products.

References

1. Barabási, Albert-László, Giulia Menichetti, and Joseph Loscalzo. "The unmapped chemical complexity of our diet." *Nature Food* 1.1 (2020): 33-37.
2. Liu, Rui Hai. "Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals." *The American Journal of Clinical Nutrition* 78.3 (2003): 517S-520S.
3. De Vos, Ric CH, et al. "Untargeted large-scale plant metabolomics using liquid chromatography coupled to mass spectrometry." *Nature Protocols* 2.4 (2007): 778.
4. Llorach, Rafael, et al. "Comparative metabolite fingerprinting of legumes using LC-MS-based untargeted metabolomics." *Food Research International* 126 (2019): 108666.
5. Klåvus, Anton, et al. ""Notame": Workflow for Non-Targeted LC–MS Metabolic Profiling." *Metabolites* 10.4 (2020): 135.
6. Bonnely, Samuel, et al. "Antioxidant activity of malt rootlet extracts." *Journal of Agricultural and Food Chemistry* 48.7 (2000): 2785-2792.
7. Koistinen, Ville M., et al. "Side-stream products of malting: a neglected source of phytochemicals." *NPJ Science of Food* 4.1 (2020): 1-9.

Recent Publications

Recently published papers in metabolomics

- Analysis of urinary exosomal metabolites identifies cardiovascular risk signatures with added value to urine analysis
- Plasma Metabolomic Profiling in 1391 Subjects with Overweight and Obesity from the SPHERE Study
- Global biochemical analysis of plasma, serum and whole blood collected using various anticoagulant additives
- Vaginal metabolic profiles during pregnancy: Changes between first and second trimester
- Untargeted Stable Isotope Probing of the Gut Microbiota Metabolome Using 13 C-Labeled Dietary Fibers
- Molecular subgroup of periodontitis revealed by integrated analysis of the microbiome and metabolome in a cross-sectional observational study
- An Integrative Approach for the Characterization of Plant-Pathogenic Streptomyces spp. Strains Based on Metabolomic, Bioactivity, and Phylogenetic Analysis
- Ocular growth and metabolomics are dependent upon the spectral content of ambient white light
- Gaussian graphical modeling of the serum exposome and metabolome reveals interactions between environmental chemicals and endogenous metabolites
- Per-Particle Triglyceride-Rich Lipoproteins Imply Higher Myocardial Infarction Risk Than Low-Density Lipoproteins: Copenhagen General Population Study
- The Role of Raman Spectroscopy Within Quantitative Metabolomics
- Circulating trimethylamine N-oxide in association with diet and cardiometabolic biomarkers: an international pooled analysis
- Genetic and environmental influences on covariation in reproducible diet-metabolite associations
- mzRAPP - A tool for reliability assessment of data pre-processing in non-targeted metabolomics
- Robust and Comprehensive Targeted Metabolomics Method for Quantification of 50 Different Primary, Secondary, and Sulfated Bile Acids in Multiple Biological Species (Human, Monkey, Rabbit, Dog, and Rat) and Matrices (Plasma and Urine) Using Liquid Chromatography High Resolution Mass Spectrometry (LC-HRMS) Analysis
- Associations of prenatal metabolomics profiles with early childhood growth trajectories and obesity risk in African Americans: the CANDLE study

Metabolomics Events

Postponed Until 2021

The Third Annual Canadian Metabolomics Conference

Venue
Edmonton, Alberta, Canada

Overview
The Third Annual Canadian Metabolomics Conference has been postponed until 2021. The conference will highlight work by leading researchers, including new technologies and approaches for metabolomics research, and applications in various fields. The conference will feature networking opportunities and a poster session designed for trainees to present their work. Our goal is to highlight the exceptional metabolomics science that is being done in Canada and abroad, and foster Canada's leadership role in the global research community.

We look forward to seeing you in 2021!

Conference Link
https://www.canmetcon.ca/

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4 May 2021 (& 12, 19, 27 May 2021)

Metabolomics and Life Sciences Series

Venue
Online

Find out how metabolomics can move your discoveries towards translation

May 4, 2:00 - 3:00 PM MDT
Register here now.

This presentation will introduce attendees to the field of metabolomics and explain how metabolomics works, why it's being used and what it can do. Dr. David Wishart will explain how Alberta has become a world leader in metabolomics and give a brief history of The Metabolomics Innovation Center (TMIC). TMIC is Canada's national metabolomics facility and based right here in Alberta. A virtual tour of TMIC will be provided and examples will be given of how meta-

bolomics is allowing discoveries to be translated into practice.

Speaker
Dr. David Wishart, Director, The Metabolomics Innovation Center

Save the date and watch for registration details for:

May 12, 2:00 - 3:00 PM - Metabolomics and Precision Medicine
May 19, 2:00 - 3:00 PM - Metabolomics and Agri-Food
May 27, 3:30 - 4:30 PM - Metabolomics and the Environment

3 June 2021

Using MSDIAL to Generate Accurate Comprehensive LC-MS/MS Metabolomics Datasets

Venue
Online, University of California, Davis, Davis, California

Instructor
Jake Folz, University of California, Davis

Registration

Required software: MS-DIAL vs. 4.0 for PCs. This software does not run on Mac or Linux environments.

Participant prerequisites: Basic understanding of LC-MS and understanding of how MS/MS spectra are used in metabolite identification.

Short description of the course: This short course will focus on how to perform fine tuned curation of processed LC-MS/MS data generated through MS-DIAL including compound identification, data quality analysis, and unknown feature reduction. Data from rat blood plasma analyzed using LC-MS/MS with MS/MS data collected in a data-dependent manner will be used to generate an example dataset, but the methods and techniques are applicable to many different sample types.

For more information, please visit the Bits & Bites: Short Course Series 2021 website.

14-18 June 2021

CliMetabolomics

Venue
Versailles and Bordeaux, France

Overview
CliMetabolomics aims to better understand the plasticity of plants and to develop sustainable plants adapted to climate change. The event consists of seminars, discussions and many practical courses. The workshop is aimed at doctoral students, post-docs and young researchers working in France or Germany. It is funded by INRAE, Science Campus and the Franco-German University.

Metabolomics Events

Event Link

15-18 June 2021

Hands-on Data Analysis for Metabolic Profiling

Venue
Online, Imperial College London, London, United Kingdom

Overview
This course will be run online, with Live lectures and tutorials using MS Teams.

We offer a comprehensive, hands-on training in processing and analysing metabolomics data from LC-MS and NMR technologies.

Attendees will have the opportuniry to:
- Learn directly from internationally recognised leaders in the field
- Benefit from practical training in computational techniques and statistical methods

Course Aims
This 3.5 day online course provides a comprehensive overview of data analysis for metabolic profiling studies focussing on data from NMR spectroscopy and Liquid Chromatography-Mass Spectrometry. It combines lectures and tutorial sessions using open source software to ensure a thorough understanding of the theory and practical applications.

Course Link

22-24 June 2021

Metabolomics 2021 Online

Save the Date! Metabolomics 2021 Online will take place June 22 - 24, 2021. Registration is now open!

We are excited to introduce **Metabolomics 2021 Online**, the second virtual conference that will take place from June 22-24, 2021. While we will not be meeting in person, I am confident that the caliber of our program this year will push the boundaries of our understanding in multiple domains of metabolomics research.

The conference will follow the general format that we instituted for Metabolomics 2020 Online, with the conference taking place in all time zones, enabling it to continue as a truly international event. We will open the conference with day 1 offering workshops on special interest topics, which has now become a tradition of our conference format. Days 2 and 3 will feature scientific sessions that will begin with a keynote speaker followed by talks selected from submitted abstracts and the ability for viewers to ask questions, in order to maximize member interactions. For each of us, some talks will be at more convenient times than others because the conference will take place through many time zones. Fortunately, recorded talks will be available to access and watch later during the virtual event, so don't worry about staying up all night to attend a talk you wanted to hear at 3 AM!

We will also host virtual poster sessions, networking opportunities, and special interest sessions that will include a town hall and early career member network meetings, among others. One thing that we can say is the plethora of virtual meetings over the last year has taught us much on how to

effectively engage through virtual events and we will use this to our advantage. So get excited about Metabolomics 2021 Online! Registration fees for the meeting will be greatly reduced for all registered members of the Society.

Now is a great time to become a member of the Society! If you are already a member, then please go ahead and register for the meeting. I would also encourage you to submit an abstract to present your work at the conference, as we depend on each of you to hear about the latest in cutting-edge research. We look forward to seeing you virtually at Metabolomics 2021 Online.

Conference Link

METABOLOMICS SOCIETY

12-16 July 2021

2021 EMSL Summer School

Venue

Online, Pacific Northwest National Laboratory, Richland, Washington, USA

Virtual Multi-omics Modeling of Biochemical Pathways Summer School

Researchers interested in modeling of multi-omics data are invited to attend the virtual Multi-omics Modeling of Biochemical Pathways Summer School July 12-16, 2021. Presentations given during this week-long event are free and open to the public.

Learn from world-class national laboratory and academic researchers how to use visualization tools, analysis, and modeling of multi-omics data for understanding biochemical pathways. Hosted by the Environmental Molecular Sciences Laboratory (EMSL) and Agile Biofoundry groups, this event will feature lectures on software and data analysis.

Post-doctoral researchers and advanced PhD students are invited to submit applications to attend smaller tutorial classes with summer school instructors. These tutorials are closed to the public. Applications are due April 2nd. Twenty-five applicants will be competitively selected. Follow this link for more information about the application process.

Overview of daily topics covered during this Summer School event:

- Experimental Design
- Transcriptome & Proteome Data
- Metabolomics and Lipidomics Data
- Metabolic Modeling
- Fluxomics

Visit pnnl.cventevents.com/2021summerschool for information about speakers, topics covered, applications for the competitively-selected tutorials, and much more.

Metabolomics Events

5 Aug 2021

Identification of Unknown Compounds in Untargeted Metabolomics using Freely Available Software for Compound ID

Venue
Online, University of California, Davis, California, USA

Instructor
Dr. Arpana Vaniya, UC Davis

Registration

Required software: MS-FINDER & SIRIUS+CSI:FingerID. CFM-ID will be the web-based tool. Versions of tools to be used will be announced closer to the course date.

Participant prerequisites: Basic knowledge of computer skills. No coding experience needed.

Short description of the course: Compound identification is known as the bottleneck in metabolomics. However, there are many approaches one may consider while tackling this challenge (i.e., mass spectral library search, in silico fragmentation tools, or database searching). This short course will provide an overview on the current status of compound ID in metabolomics, participants will learn how to use some current tools for compound ID (i.e., CFM-ID, MS-FINDER, and SIRIUS+CSI:FingerID), and apply those skills to some unknown challenges.

For more information, please visit the Bits & Bites: Short Course Series 2021 website.

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30 Aug-10 Sep 2021

International Summer Sessions in Metabolomics

Venue
Online, University of California, Davis, California, USA

Registration

The course will include:
1. Study design, including pitfall analysis and hidden biases in studies from microbial, plant, mouse and human cohort research
2. Sample preparation and quality control
3. In-laboratory detailed discussions standard operating procedures for GC-MS and LC-MS data acquisitions
4. Targeted metabolomics, including monitoring charts and use of isotope labeled internal standards
5. Exercises on flux analysis in cancer cells by isotope tracer analysis
6. Untargeted data processing and exercises on MS-DIAL software
7. Exercises on identification of unknowns by cheminformatics software workflows (incl MS-FINDER, CFM-ID, and various databases and small software routines)
8. Data normalization and transformation with and without internal standards and quality controls
9. Multivariate and univariate statistics
10. Pathway mapping

For information and registration click here.

Metabolomics Events

27-30 Sep 2021

CliMetabolomics

Venue
Leipzig and Halle / Saale, Germany

Overview
CliMetabolomics aims to better understand the plasticity of plants and to develop sustainable plants adapted to climate change. The event consists of seminars, discussions and many practical courses. The workshop is aimed at doctoral students, post-docs and young researchers working in France or Germany. It is funded by INRAE, Science Campus and the Franco-German University.

Event Link

17-19 Oct 2021

3rd Annual MANA Conference: Foods for Health Discovery Theme

Venue
The Ohio State University, Columbus, Ohio, USA

MANA 2021 conference website

If you seek to get ***your*** planned metabolomics event endorsed by MANA and receive MANA funds, please contact us!

1-5 Nov 2021

Hands-On Mass Spectrometry Course

Venue
Department of Animal Science, Aarhus University, Blichers Allé 20, Tjele, Denmark

At Aarhus University, Department of Animal Science, we are organizing a "Hands-on mass spectrometry course", which will give insight in the use of mass spectrometry for a range of analyses with relevance in animal science. The course will take place November 1-5, 2021.

Course Flyer

Metabolomics Jobs

If you have a job you would like posted, please email Ian Forsythe (metabolomics.innovation@gmail.com).

Jobs Offered

Job Title	Employer	Location	Posted	Closes	Source
Various Positions			22-Apr-21		Metabolomics Association of North America Jobs
Research Fellow in Computational Metabolomics	University of Birmingham	Birmingham, UK	19-Apr-21	6-May-21	University of Birmingham
PhD Student and Post-doctoral Fellow Positions in Mass Spectrometry Metabolomics and Proteomics	Technion – Israel Institute of Technology	Haifa, Israel	29-Mar-21	6-May-21	MetaboNews Jobs
Research Associate, Entomology Department	Cornell University	Ithaca, NY, USA	22-Mar-21	Until Filled	AcademicJobs Online.org
Business Development Manager	TMIC, Faculty of Science, University of Alberta	Remote	17-Mar-21	Until Filled	University of Alberta Careers Page
Postdoctoral R&D Scientist - NMR-based metabolomics	Lesaffre	Loos, France	16-Mar-21	Until Filled	SmartRecruiters.com
UCD Post-doctoral Research Fellow Level 1	UCD	Dublin, Ireland	12-Mar-21	30-Apr-21	MetaboNews Jobs
Post-doctoral Fellow - Metabolomics via NMR, Neuro-Oncology Branch	National Cancer Institute	Bethesda, MD, USA	8-Mar-21	Until Filled	National Cancer Institute
Postdoctoral Research Fellow, Metabolomics and Nutritional Epidemiology	McMaster University	Hamilton, ON, Canada	23-Feb-21	5-Jul-21	TMIC Careers Page
Marketing Specialist – Metabolomics Application Development (147595BR)	Thermo Fisher Scientific, Inc.	San Jose, California, USA	23-Feb-21	Until Filled	Thermo Fisher Scientific, Inc.

Metabolomics Jobs

Job Title	Employer	Location	Posted	Closes	Source
Marketing Specialist – Metabolomics Application Development (148431BR)	Thermo Fisher Scientific, Inc.	San Jose, California, USA	23-Feb-21	Until Filled	Thermo Fisher Scientific, Inc.
Research Technologist	Cold Spring Harbor Laboratory	Cold Spring Harbor, NY, USA	17-Jan-21	Until Filled	Cold Spring Harbor Laboratory
Post-doctoral Fellow / Staff Scientist – Metabolomics	Oklahoma Medical Research Foundation	Oklahoma City, Oklahoma, USA	17-Dec-20	Until Filled	Metabolomics Society Jobs
Postdoctoral Researcher in Analytical Environmental Cheminformatics	University of Luxembourg	Belval Campus, Luxembourg	Dec-20	Until Filled	University of Luxembourg
PhD Research Project Opportunities, Centre for Integrative Metabolomics and Computational Biology	Edith Cowan University	Joondalup, Australia	13-Dec-20	Until Filled	Edith Cowan University
Postdoctoral Position	NIH	Rockville, Maryland, USA	20-Nov-20	Until Filled	Metabolomics Society Jobs
Post-Doctoral Position with influence of multiple 'omics' datatypes on the development of respiratory and/or neurological disease	Brigham and Women's Hospital and Harvard Medical School	Boston, MA, USA	20-Nov-20	31-May-21	Metabolomics Society Jobs
Postdoctoral Fellow – Biosensors Device Development	University of Alberta	Edmonton, Canada	23-Oct-20	Until Filled	Wishart Research Group
Postdoctoral Position in Nuclear Magnetic Resonance (NMR) Spectroscopy	University of Alberta	Edmonton, Canada	23-Oct-20	Until Filled	Wishart Research Group
Laboratory Assistant/ Technician – Biosensors Device Development	University of Alberta	Edmonton, Canada	23-Oct-20	Until Filled	Wishart Research Group
Senior Bioinformatician/ Cheminformatician Position	University of Alberta	Edmonton, Canada	23-Oct-20	Until Filled	Wishart Research Group

Jobs Wanted

This section is intended for very highly qualified individuals (e.g., lab managers, professors, directors, executives with extensive experience) who are seeking employment in metabolomics.

We encourage these individuals to submit their position requests to Ian Forsythe (metabolomics.innovation@gmail.com). Upon review, a limited number of job submissions will be selected for publication in the Jobs Wanted section.

- Dr. Nara Consolo - Seeking a position involving the application of NMR-based metabolomics in animals/animal production; it could be a Researcher position or an Assistant Professorship