

SUSTAINABILITY IN PHARMACEUTICAL SEPARATION SCIENCE: A virtual symposium

Wednesday, April 19, 2023

12:30pm BST | 7:30am EST | 13:30pm CEST

Event Overview

Sustainability is a driving force across the globe, but what steps are separation scientists taking to reduce the environmental impact of their activities? Leading experts involved in separation science in the pharmaceutical sector will reveal what they are doing to reduce the environmental impact of their activities. The principles discussed for "greener" analysis can also be applied in other sectors. *LCGC Europe* EAB member, Paul Ferguson, has organized this virtual symposium on behalf of The Chromatographic Society (ChromSoc) and has extensive practical experience in separation science in the pharmaceutical industry.

The programme will be divided into two sections. In the first part, key opinion leaders will discuss the latest best practices for separation scientists involved in pharmaceutical analysis. In the second session, leading chromatography companies will reveal what their companies are doing in relation to sustainability and separation science, and how they are reducing the environmental impact of their activities in practice.

Key Learning Objectives

- Learn about the core concepts concerning sustainability and analytical science with a focus on separation science
- Find out about enabling technologies that accelerate drug discovery in a sustainable manner
- Discover how *in silico* modelling and chemometrics can contribute to greener chromatography
- Learn about emerging trends in "green" sample preparation techniques
- Discussion with the panelists in live QA session

Sponsored By:



Session One Agenda

12:30pm BST 7:30am EST 13:30pm CEST	Opening Remarks <i>Paul Ferguson, Honorary Secretary of The Chromatographic Society, The Chromatographic Society (ChromSoc)</i>
12:45pm BST 7:45am EST 13:45pm CEST	Setting the Scene for Sustainability in Separation Science <i>Tony Edge, President of the Chromatographic Society (ChromSoc), The Chromatographic Society</i> The concept of sustainability will be introduced and how it impacts the field of analytical science and, more specifically, separation science. After a brief introduction on the impact that separation science has on the planet's carbon load, the presentation will move to discuss Anastas' twelve rules of green chemistry and how they can be readily applied to separation science. Finally, the application of the 4 R's of reduce, replace, recycle, and remove will be discussed in the context of a chromatography laboratory. This will then set the scene for other presenters who will focus on specific technology areas and how these are being used to address the climate issues facing all of us.
13:00pm BST 8:00am EST 14:00pm CEST	Enabling Technologies to Accelerate Oncology Projects in a Sustainable Manner <i>William Farrell, Associate Research Fellow: Oncology Medicinal Chemistry, Pfizer Global R&D – La Jolla Laboratories, San Diego, California, USA</i> Pfizer actively strives to find innovative ways to minimize the company's impact on the environment during the manufacturing of pharmaceuticals and is continuously "greening" the process. The company leverages its green chemistry programmes to advance scientific innovation and help develop processes that are more sustainable, environmentally benign, and cost-effective. Whereas the impact can easily be quantified with tangible metrics during the manufacturing phase of a pharmaceutical, there still exists the opportunity for significant contributions to be made within analytical chemistry during the discovery phase. This talk will focus on the use of the analytical method greenness score (AMGS) to show how enabling technologies, such as SFC, can be a greener alternative to HPLC for chromatographic analysis and purification. In addition, case studies will be provided detailing the use of the AMGS to quantifiably benchmark methods and guide the selection of greener chromatographic conditions.
13:30pm BST 8:30am EST 14:30pm CEST	Concepts for Sustainable Analytical Science <i>Matthew Osborne, Associate Principal Scientist – Separation Science, Chemical Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK</i> This presentation will focus on general concepts that analytical scientists can consider when embarking on the development of new or existing analytical methods to increase the greenness of their approaches and reduce the environmental impact of their analysis. Whilst primarily focusing on moving chromatographic methods to their greenest position possible, the presentation will also briefly introduce some wider perspectives and considerations that all contribute to increase greenness of the analytical sciences.

Session One Agenda (cont.)

14:00pm BST 9:00am EST 15:00pm CEST	<p>How <i>in silico</i> Modelling and Chemometrics Can Contribute to Greener Chromatography <i>Patrik Petersson, Principal Scientist, Ferring Pharmaceuticals, Copenhagen, Denmark</i></p> <p>The presentation will cover different aspects of how <i>in silico</i> modelling and chemometrics can contribute to greener chromatography. It is evident that a scaling from HPLC to UHPLC will reduce solvent consumption dramatically. Modelling and other <i>in silico</i> tools can, however, also reduce solvent consumption by reducing both the time and number of experiments needed for method development.</p>
14:30pm BST 9:30am EST 15:30pm CEST	<p>Green Sample Preparation: It's All Green <i>Douglas Raynie, Associate Professor and Department Head, Department of Chemistry and Biochemistry, South Dakota State University, USA</i></p> <p>The aims of green chemistry, chemical analysis, and sample preparation are not contradictory. In fact, the new extraction techniques developed over the past generation, while created for their performance advantages, address green chemistry concerns of waste, solvent use, energy efficiency, and toxicology. We will look at an overview of new and emerging sample preparation technologies, their performance in various applications, and the resulting green benefits.</p>
15:00pm BST 10:00am EST 16:00pm CEST	<p>Live Panel Discussion</p> <p>Live QA discussion with speakers from session one answering questions from the audience</p>

Session One Speakers

Paul Ferguson

Honorary Secretary of The Chromatographic Society, The Chromatographic Society (ChromSoc)

Paul Ferguson is Honorary Secretary of The Chromatographic Society. He has previously served as Vice President for the Society from 2009 to 2014 and President from 2014 to 2017. He has organized or co-organized several successful symposia for the Society since 2007, including the inaugural Grass Roots educational event held in Grasmere in 2016. He is also a member of the local organizing committee for ISC 2024 in Liverpool. For his “day job”, he is a separation science specialist at AstraZeneca in the UK. He has worked in the pharmaceutical industry since 1999 following a postdoc at Imperial College London on capillary electrochromatography (CEC). Paul has particular interest in UHPLC, SFC, CE, chiral separations, formulated drug sample preparation, green analytical chemistry, and method development. He is a past winner of the Desty Memorial lecture prize (2002), a Fellow and Chartered Chemist in the RSC, and lectures on his research interests at various UK and international universities.

Tony Edge

President of the Chromatographic Society (ChromSoc), The Chromatographic Society

Tony Edge is the current President of The Chromatographic Society. He has been President for the last five years and prior to that he was Vice President for three years; he also has extensive experience managing R&D teams developing next-generation stationary phases for HPLC. He has worked in both manufacturing and industry, with periods of employment at LGC, AstraZeneca, as well as Thermo Fisher Scientific, Agilent Technologies, and latterly Avantor. In 2008, he was fortunate enough to be awarded the Desty memorial lecture for his contributions to innovating separation science, and in the same year he also won a clinical excellence award from AstraZeneca. As well as holding the post of President of the Chromatographic Society, he is also the current chair for the permanent scientific committee for the International Symposium on Chromatography.

William Farrell

Associate Research Fellow: Oncology Medicinal Chemistry, Pfizer Global R&D – La Jolla Laboratories, San Diego, California, USA

William Farrell is an associate research fellow at Pfizer Global R&D – La Jolla. He received his BS degree from SUNY Stony Brook and has over 30 years chromatographic experience, specializing in SFC and HPLC techniques. He has spent the last 25 years working on the implementation of SFC and HPLC for the analysis and purification of medicinal and combinatorial derived compounds. He has been a major driving force behind the development of automated preparative SFC systems and has pioneered the use of SFC for high-throughput applications for which he received the first annual America Award for his contributions to preparative SFC and the ACS Technical Achievement in Organic Chemistry (TAOC) Award. He is a member of Pfizer and ACS Green Chemistry initiatives and has been awarded prizes in 2004 and 2009 for innovations in green chemistry. As a member of the GCIPR Analytical sub team, he aided in the rollout of the AMGS, an ACS webtool for the quantitation of greenness of analytical methods. His current research areas include expanding SFC applications into biological systems, the development of novel, SFC-specific stationary phases, and 3D-printing.

Session One Speakers (cont.)

Matthew Osborne

Associate Principal Scientist – Separation Science, Chemical Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

Matt joined AstraZeneca in 1997 as a scientist in analytical pharmaceutical development after gaining his first degree in chemistry and master's degree in analytical chemistry. Since joining AstraZeneca, he has held technical roles across analytical and biopharmaceutical disciplines, delivering numerous clinical-phase regulatory submissions. He has worked across discovery, pharmaceutical sciences, product development, and is currently scientific leader for separation sciences within Chemical Development. Matt also co-chairs the Analytical Focus Group within the American Chemical Society's Green Chemistry Institute Pharmaceutical Roundtable. He jointly leads the analytical team in their mission to achieve the objectives of the broader roundtable, seeking opportunities to advance greener, more sustainable applications of analytical methodologies within the pharma industry. These encompass advancing the research agenda, educating leaders, providing tools for green innovation, and promoting global collaborations.

Patrik Petersson

Principal Scientist, Ferring Pharmaceuticals, Copenhagen, Denmark

Patrik Petersson is a principal scientist at Ferring Pharmaceuticals in Copenhagen, Denmark. He has worked with analytical separation techniques within the pharmaceutical industry for 28 years (AstraZeneca, Novo Nordisk, and Ferring). During his time within industry, his link to the academic world has been maintained through collaborations, teaching, and supervision of M.Sc./Ph.D. students. This has resulted in 68 publications and 28 oral presentations.

Douglas Raynie

Associate Professor and Department Head, Department of Chemistry and Biochemistry, South Dakota State University, USA

Doug Raynie is department head and associate professor in the Department of Chemistry and Biochemistry at South Dakota State University (SDSU). He joined SDSU in 2001 following 11 years in the Corporate Research Division at Procter & Gamble. He earned his Ph.D. at Brigham Young University under the direction of Milton Lee. His research focuses on green chemistry, especially the use of supercritical fluids, ionic liquids, deep eutectics, and other novel solvent systems for biomass processing and analytical separations, with over 100 publications in this area. Under his leadership, SDSU has become one of the inaugural signatories to the Green Chemistry Commitment, where Raynie serves on the advisory board. He has received the ACS Committee on Environmental Improvement Award for Incorporating Sustainability into Chemistry Education, and the Minnesota Chromatography Forum's L.S. Palmer Award. He is the "Sample Preparation Perspectives" columnist and editorial advisory board for *LCGC* magazine.

Session Two Agenda

15:30pm BST 10:30am EDT 16:30pm CEST	<p>How Miniaturization Can Help to Gain Sustainability and Sensitivity at the Same Time <i>Dr. Daniel Eber, Product Manager Analytical Chromatography, YMC Europe</i></p> <p>There are many ways to make the use of HPLC more sustainable. A very effective measure is to reduce HPLC column internal diameters from >2.1 mm to 1 mm or less which significantly reduces eluent consumption. Another gain is increased sensitivity. This talk shows how efficiently and straightforwardly miniaturization can be implemented in your laboratory. You will get to know a comprehensive selection of efficient miniaturization approaches for a successful downscale with very practical tips and tricks.</p>
15:50pm BST 10:50am EDT 16:50pm CEST	<p>UCT's Refine™ Ultra-Filtration Technology <i>Ritesh Pandya, Technical Specialist, UCT</i></p> <p>UCT's Refine™ Ultra-Filtration technology enables concurrent protein precipitation and filtration of samples in a single well plate or column, expediting the protocol in under 15 minutes. The hydrophobically treated dual-frit combo prevents leakage of the sample and organic solvent, enhancing the filtering process and extending the lifespan of analytical columns. Moreover, this method eliminates the need for sample transfer, reducing the probability of errors.</p>
16:10pm BST 11:10am EDT 17:10pm CEST	<p>Reducing HPLC Solvent Consumption Using 1.5-mm Internal Diameter Columns <i>Conner McHale, Technical Support Specialist, Advanced Materials Technology</i></p> <p>Advanced Materials Technology is now offering a new 1.5 mm internal diameter column dimension. By lowering the column internal diameter sensitivity gains are achieved along with reduction in overall solvent consumption. Applications will be demonstrated showing the advantages of the 1.5mm internal diameter column including examples for small molecule and biological methods.</p>
16:30pm BST 11:30am EDT 17:30pm CEST	<p>Oligonucleotide LC-MS Analysis by HILIC Mode in the Absence of Ion-Pair Reagents for Sustainability in the Pharmaceutical Industry <i>Tanya Napolitano, Technical and Marketing Manager, Shodex HPLC</i></p> <p>Oligonucleotide therapeutics, such as antisense nucleic acid drugs, are promising candidates for genetic, metabolic, and cancer treatments. The Shodex™ HILICpak™ VN-50 columns were used for several oligonucleotide analysis by LC-MS in the absence of ion-pair reagents. Based on the LC-MS performance, this HILIC-based approach provides an attractive, sensitive, and robust alternative to prior ion-pairing dependent methods without compromising chromatographic or MS performance. These analyses reduce toxic waste and are sustainable methods for Pharmaceutical Industries.</p>

Session Two Agenda (cont.)

16:50pm BST 11:50am EDT 17:50pm CEST	<p>Greener Labs with Laboratory Services <i>Dr. Angelo Filosa, Practice Leader Professional & Technology Services, PerkinElmer OneSource</i></p> <p>PerkinElmer OneSource understands the importance of sustainability in the laboratory. Built into the company's delivery of laboratory services are solutions that reduce waste, minimize energy consumption, and offset your carbon footprint. In this talk the audience will hear about paperless UOQ (Universal Operational Qualification) processes, frontline concierge support that reduces travel to site, remote services, and minimizing energy consumption by optimizing your laboratory's instrument footprint.</p>
17:10pm BST 12:10am EDT 18:10 pm CEST	<p>VUV Analytics and LUMA™: Setting New Standards for Sensitivity, Selectivity, Simplicity and Sustainability. <i>Peter Boler, Vice President of Marketing and Support, VUV Analytics</i></p> <p>Sustainability has become a critical concern for laboratories worldwide, with a growing need to reduce environmental impact while maintaining scientific excellence. Instrument vendors like VUV Analytics play a vital role in promoting laboratory sustainability by developing and providing innovative, sustainable products and services. VUV Analytics has taken a proactive approach to laboratory sustainability by developing LUMA™ an innovative multichannel VUV absorbance detector that is setting new standards for sensitivity, selectivity, simplicity, and of course sustainability. This talk will present an overview of VUV Analytics and the new LUMA Multi-Channel VUV Absorbance Detector.</p>

Session Two Speakers

Dr. Daniel Eßer

Product Manager Analytical Chromatography, YMC Europe

Daniel Eßer studied chemistry at the University of Applied Sciences Bonn-Rhein-Sieg, in Rheinbach, Germany, with a focus on pharmaceutical and analytical chemistry. He received his Ph.D. in pharmaceutical and medicinal chemistry at the University of Düsseldorf, Germany. During his postdoc at the Institute of Pharmaceutical and Medicinal Chemistry of the University of Düsseldorf, he established a nanoLC-MS system. In 2013 he joined YMC Europe in Dinslaken, Germany, as product specialist analytical chromatography. Since 2017, he has been responsible for YMC's analytical (U)HPLC column portfolio as product manager analytical chromatography.

Ritesh Pandya

Technical Specialist, UCT

With a Master's degree in Biotechnology and Forensic Science, Ritesh has accumulated extensive experience as a Toxicologist at a private lab in Fresno, CA. During his tenure, he extracted and analyzed drugs from biological samples in real-life cases and provided expert testimony on key issues such as pharmacology, analytical result interpretation, and alcohol toxicology. His responsibilities as a Technical Specialist at UCT include developing methods, evaluating new products and providing technical support pertaining to forensic and clinical applications.

Conner McHale

Technical Support Specialist, Advanced Materials Technology

Conner McHale earned his B.A in Chemistry from West Virginia University. He is with the technical support group at Advanced Materials Technology where for over 8 years he has focused on quality assurance, instrument maintenance, technical support, sales, and HPLC applications. Conner has developed over 100 Halo application notes. Prior to joining AMT Conner gained experience in food science, specifically winery science where he was responsible for testing and monitoring the wine making process at a local winery. This included yeast preparation, monitoring fermentation temperatures, measuring brix levels, cleaning, and bottling – and of course sampling!

Tanya Napolitano

Technical and Marketing Manager, Shodex HPLC

Tanya is a biochemistry PhD graduate from CUNY Graduate Center, with around 10 years of scientific research experience. She has extensive knowledge in many research techniques. However, her current work is focused on method development of various biopharma and analytical projects. Tanya has a strong background in drug development, chromatography products, peptide synthesis, MS, HPLC, and CESI analysis, recombinant work, cell culture, PCR, as well as science communications and marketing. She has been working as the Technical and Marketing manager of Shodex HPLC products since July 2022.

Session Two Speakers (cont.)

Dr. Angelo Filosa

Practice Leader Professional & Technology Services, PerkinElmer OneSource

Angelo Filosa is the Global Head of Professional & Technology Services for OneSource, where he consults for a variety of organizations – helping to improve laboratory efficiencies and develop strategic roadmaps for operational improvement initiatives. Prior to PerkinElmer, he was an Associate Director in Chemistry at Boehringer Ingelheim leading analytical chemistry and compound management groups. He also worked in drug development with Eli Lilly and in drug discovery at AstraZeneca. He holds a PhD in Chemistry from Concordia University.

Peter Boler

Vice President of Marketing and Support, VUV Analytics

With over 30 years of experience in the analytical chemistry and technology markets Mr. Boler has worked for respected industry players such as the Waters Corporation and innovative technology startups like Persistent Systems and Optra Health, where he focused on bringing innovative new products to market. At VUV Analytics, Mr. Boler is responsible for marketing and support and continues to focus on driving innovative new analytical instrument technologies like the LUMA™ Multi-Channel VUV Absorbance Detector to market.
