



Training Courses for Mass Spectrometry and Surface Plasmon Resonance 2024

Instrumentation, Software Packages and Solution for
Life Science and Applied Markets

Innovation with Integrity

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Power up Your Skills and Share Your Knowledge

Trainings on Bruker instrumentation, software packages and solutions are provided by very experienced application experts.

Various courses are available covering the range from absolute beginners to experienced users.

- **Training**
- **Improvement**
- **Practice**
- **Focus**
- **Intelligence**
- **Lesson**
- **Motivation**
- **Success**

General Remarks and Information for Training Courses

Registration

For registration, please access the online registration at www.bruker.com or contact training-hb@bruker.com.

Registration

After submission of your registration, you will get a summary of the submitted information automatically. This is not a confirmation. The registrations will be taken into consideration on a first come, first served basis.

Confirmation

After receiving your registration, we will confirm your participation. If the selected training course is already fully booked, we will inform you immediately.

Training costs

Training costs include the course fees as well as lunch and beverages during the training.

Travel and accommodation are excluded. Please contact your local Bruker Training Center to get a list of recommended hotels located nearby.

Course language

All courses will be held in English unless otherwise agreed with the customer.

Cancellation

Bruker Daltonics GmbH & Co. KG reserves the right to cancel the training if the minimum number of participants is not achieved one month prior to the training date.

Customers may cancel in writing not later than one month prior to the training date at a full refund of the training price. If customer cancels later than two weeks before the training, the full training fee will be charged. Customers may substitute a participant without extra charge or payment in this case. Bruker needs to be informed to register the new participant beforehand.

Training material

Training material will be provided by the trainer. Any recordings of training or parts of training are prohibited.

Bruker general terms and conditions of supply and service apply.

Overview

Training Courses at a Training Center

Essential Operator Training Courses

- Introductory courses at a Bruker training center.
- Includes instrument control, data acquisition and processing.
- Includes sample preparation and application-specific training
- If HPLC is required, it includes application relevant HPLC aspects but does not substitute an explicit HPLC training.
- The number of participants is usually limited to 6 persons per course.
- Price is per person and excludes all travel and lodging expenses.

Advanced Operator Training Courses

- Prerequisite for attending an advanced operator training course is the successful participation in an essential operator training course.
- Basic theory will be touched on, but will not be in the focus of advanced trainings.
- Comprehensive software courses to give an overview of software functionalities for a fast productivity ramp-up.
- Price is per person and excludes all travel and lodging expenses.

Onsite Training Courses

Onsite Operator Training Courses

- Contents are defined prior to the training between the customer and Bruker training center.
- Time needs should be calculated analogously to the factory training courses. Parameter optimization in your lab and of your instrument requires approximately an additional half day.
- The number of participants in the training is not limited but should not exceed a reasonable number to ensure a good interaction between trainees and trainer (usually up to 6 persons). A training room should be provided by the customer to ensure a productive training.
- Bruker reserves the right to convert an ordered onsite training into an in-house training in case of war, civil war, political instability, the risk of terrorist activity, pandemics or natural disasters which pose a significant threat for Bruker employees. In this case, Bruker will carry the costs for traveling in economy class to the Bruker training center providing the training as well as lodging costs for a maximum of two training participants. Travel costs of accompanying persons not participating in the training cannot be covered.

Online Training Courses

Online Operator Training Courses

- Software training courses are offered online.
- Courses can be spread on multiple sessions to allow for smaller amount of information per session.
- To offer trainings during times when travelling is difficult or not allowed a variety of online trainings is available.



Did you know?

Bruker LabScape maintenance service agreements are not only a key component for maximizing the duty cycle and reliability of your instrument. It is also your access to a global network of application and support specialists as well as original parts and supplies. Depending on your contract you enjoy a basic or premium discount on Bruker MALDI consumables, dedicated training and targeted application support.

Get in touch with your local Bruker office and discover your possibilities.

LabScape® Service & Lifecycle Support

Maintenance Service Agreements for Life Science

	LabScape Connect	LabScape Essential	LabScape Access	LabScape Complete	LabScape Complete 48
Remote Services					
Remote Monitoring*	✓	✓	✓	✓	✓
Unlimited Priority Remote Support	✓	✓	✓	✓	✓
Software services					
Compass & Data Analysis SW Upgrades	✓	✓	✓	✓	✓
Postprocessing SW Licenses & Upgrades**		discount	discount	premium discount	premium discount
Upgrade of Postprocessing Software**				1 Voucher p.a	1 Voucher p.a
Regular Maintenance					
Regular Maintenance Work and Parts		✓	✓	✓	✓
Onsite Repair Services and Parts					
Unlimited Repair Visits incl. Spare Parts			✓	✓	✓
Wear and Tear Part Replacement	discount	discount	discount	✓	✓
Loaner Equipment*					✓
Compliance Services					
Operational Qualification / Perform. Validation					included
Onsite Response Service Level					
Onsite Response			3-5 business days	3-5 business days	2 nd business day
Additional benefits					
Consumable Parts	discount	discount	discount	premium discount	premium discount
Operation Training or Applications Training	discount	discount	discount	premium discount	premium discount

* if applicable to the respective product

** SCiLS™ Lab, MetaboScape®, BioPharma Compass®

Training Center Contact Information

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Training course available in Japanese language

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Training course is available in Chinese language

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Training course is available in Chinese language

Language: Check language availability at your training center. In factory trainings are not available in some regions, please check with your training center.

Training Course Index

All trainings offered with an instrument purchase can also be ordered as standalone trainings (please just look for the corresponding training order number).

Register Number	Training Name	Duration	Page
MALDI-TOF(/TOF) Operator			
Essential Operator Training Courses, In-House			
C1EP13	Proteomics	3 Days	13
C1EI13	MALDI Imaging	3 Days	14
C1ES13	Polymers and Synthetic Chemistry	3 Days	15
ESI-QTOF Operator			
Essential Operator Training Courses, In-House			
C3EL23	Low Molecular Weight Applications	2.5 Days	17
C3EL33	Low Molecular Weight Applications including MetaboScape®	3 Days	18
C3EL43	Low Molecular Weight Applications including TASQ®	3 Days	19
C3EP23	Proteomics	3 Days	20
C3EB13	BioPharma Compass® Workflows	3 Days	21
C3ET13	TargetScreeener Solution	3 Days	22

Register Number	Training Name	Duration	Page
ESI-timsTOF Operator			
Essential Operator Training Courses, In-House			
C8EL23	Low Molecular Weight Applications	3 Days	24
C8EL33	Low Molecular Weight Applications including MetaboScape®	3 Days	25
C8EB13	BioPharma Compass® Workflows	3 Days	26
C8EP23	Proteomics	3 Days	27
C8ET13	TargetScreener 4D Solution	3 Days	28
ESI-timsTOF flex Operator			
C8EI13	MALDI Imaging	3 Days	30
TQ Operator			
Essential Operator Training Courses, In-House			
C6EA23	LC-MS TQ	3 Days	32
C6EA13	GC-MS TQ	3 Days	33
C7EA11	GC-APCI	1 Day	34
MRMS Operator			
Essential Operator Training Courses, Onsite			
C4EG13	MRMS Operator	3 Days	36
C4EI12	MALDI Imaging	2 Days	37
C4EL12	Metabolomics	2 Days	38
C4EP12	Petroleomics	2 Days	38
C4EB12	Biomolecules	2 Days	40

Register Number	Training Name	Duration	Page
ESI Ion Trap Operator			
Essential Operator Training Courses, In-House			
C2EL13	Low Molecular Weight Applications	2.5 Days	42
C2EX13	Toxtyper® Routine Workflows	2.5 Days	43
UHPLC Operator			
Essential Operator Training Courses, In-House / Online			
C5EL12	Elute+ UHPLC	2 Days	45
SPR Operator			
Essential Operator Training Courses, In-House / Online			
D1EX01	SPR Pro Instruments	2 Days	47
D3AX01	SPR Individual Operator Onsite Training Course	up to 3 Days	48
Software courses			
Advanced Operator Training Courses, Online			
C9AA21	Statistical analysis of MALDI Imaging data using SCiLS™ Lab software	2 x 0.5 Days	50
C1AS11	Polymer analysis using PolyTools	0.5 Days	51
C9AA21	MetaboScape®	2 x 0.5 Days	52
C9AA61	TASQ®	2 x 0.5 Days	53
C9AA32	BioPharma Compass®	2 x 0.5 Days	54
D2AX01	SPR Pro Instruments, Analyzer & Control Software	0.5 Days	55
Advanced Operator Training Courses, Onsite			
	General	2, 3, 4 or 5 Days	56

All essential or advanced operator trainings can also be ordered onsite. Online courses and 1 day training courses are exempted from this unless sold together with other onsite trainings.

MALDI-TOF(/TOF) Operator

Training courses cover the range from instrument control to application driven solution



C1EP13

MALDI-TOF(/TOF) Essential Operator Training Course

Duration

3 Days

Proteomics

Links

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Intention

This training course focuses on the basics of practical MALDI-TOF or MALDI-TOF/TOF operation in the context of proteomics and protein analysis experiments. The course covers the essentials of sample preparation, data acquisition/processing and instrument maintenance, and, thus, will enable novice users getting started with MALDI-TOF(/TOF) analyses of peptides and proteins.

Prerequisite

No deeper pre-experience is required. However, before attending the training course, participants are encouraged to take part in the user familiarization that is done at a customer site upon installation of the MALDI-TOF(/TOF) instrument, and to gain some first practical experience over a few weeks.

Course Topics

Instrument overview

General introduction to the principles of MALDI-Compass® TOF(/TOF) (MALDI ionization, TOF(/TOF) analyzer).

Sample preparation

Sample requirements (concentration, purity), sample pre-treatment (desalting), matrices of choice and matrix preparation protocols for various types of samples (peptides, proteins, incl. samples modified by e.g. phosphorylation, glycosylation).

Data acquisition

Introduction to Bruker's flexControl software, optimization of most important acquisition method parameters (e.g. laser fluence, shot count per spectrum), automated data acquisition using autoXecute.

Data processing

Introduction to Bruker's flexAnalysis software, peak annotation, smoothing, baseline subtraction, recalibration (internal / external), automated processing using flexAnalysis methods.

Data interpretation

Introduction to Bruker's Biotoools or BioPharma Compass® software, protein identification by database search (MASCOT), batchwise database searching using batch search methods.

Instrument maintenance

Participants will be familiarized with all the maintenance operations that are to be done routinely by instrument users.

C1EI13

MALDI-TOF(/TOF) Essential Operator Training Course

Duration

3 Days

MALDI Imaging

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Intention

This course is intended for beginners in the field of MALDI Imaging and will provide a comprehensive introduction to the entire workflow. The course is focused on the mass spectrometric analysis of tissue sections using Bruker MALDI-TOF(/TOF) hardware and software.

Prerequisite

No detailed knowledge in mass spectrometry and / or histology is required to attend the course. Basic familiarity with Bruker MALDI-TOF(/TOF) instruments and a general understanding of the MALDI Imaging concept would be helpful. A substantial part of the course will be conducted in a level 2 biosafety lab.

Course Topics

Instrument overview

General introduction to the principles of MALDI-TOF(/TOF) (MALDI ionization, TOF(/TOF) analyzer).

Introduction to the concept of MALDI Imaging.

Sample preparation

Requirements to sample materials, preparation of tissue sections on conductive slides, deposition of MALDI matrix.

MALDI-TOF(/TOF) instrument operation (basics) (Introduction to flexControl software, method setup for MALDI imaging analyses).

Data acquisition

Acquisition of MALDI Imaging data using flexImaging software.

Consolidation training

Deposition of MALDI matrix, acquisition of MALDI Imaging data using flexImaging software, batch acquisition of multiple MALDI Imaging datasets.

Visualization of MALDI Imaging data in flexImaging software.

Data reprocessing workflow.

C1ES13

MALDI-TOF(/TOF) Essential Operator Training Course

Duration

3 Days

Polymers and Synthetic Chemistry

Links

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Intention

This training course focuses on the basics of practical MALDI-TOF or MALDI-TOF/TOF operation in the context of polymer and synthetic chemicals analysis. The course covers the essentials of sample preparation, data acquisition/processing and instrument maintenance, and, thus, will enable novice users getting started with MALDI-TOF(/TOF) analyses of synthetic polymers and further classes of organic and inorganic compounds.

Prerequisite

No deeper MALDI-TOF(/TOF) pre-experience is required. However, before attending the training course, participants are encouraged to take part in the user familiarization that is done at a customer site upon installation of the MALDI-TOF(/TOF) instrument, and to gain some first practical experience over a few weeks.

Course Topics

Instrument overview

General introduction to the principles of MALDI-TOF(/TOF) (MALDI ionization, TOF(/TOF) analyzer).

Sample preparation

Sample requirements (concentration, purity), matrices of choice and matrix preparation protocols for various types of samples (in particular: synthetic polymers, further compound classes will be treated on demand).

Data acquisition

Introduction to Bruker's flexControl software, optimization of most important acquisition method parameters (i.e. laser fluence, shot count per spectrum).

Data processing

Introduction to Bruker's flexAnalysis software, peak annotation, smoothing, baseline subtraction, recalibration (internal/external), automated processing using flexAnalysis methods.

Data interpretation

Introduction to Bruker's PolyTools software, determination of end groups, number-average molar mass M_n , mass-average molar mass M_w and dispersity of synthetic polymer samples

Instrument maintenance

Participants will be familiarized with all the maintenance operations that are to be done routinely by instrument users.

ESI-QTOF Operator

Training courses cover the range from instrument control to application driven solution

Essential Operator Training Courses

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C3EL23

ESI-QTOF Essential Operator Training Course

Duration

2.5 Days

Low Molecular Weight Applications

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Intention

This course is intended for novice Bruker QTOF users without significant prior experience in data acquisition, data processing and instrument maintenance. The course covers all important aspects of QTOF operation, including application-relevant HPLC aspects, but it does not substitute a dedicated HPLC training. The post processing of the data is done with the DataAnalysis software. To include MetaboScape® or TASQ® choose courses C3EL33 or C3EL43, respectively.

Prerequisite

Due to the familiarization during the system installation, participants should have a basic knowledge of the QTOF mass spectrometer (compact, impact, maXis) and some initial experience with the hardware and the software.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Introduction to Bruker QTOF systems

Overview over hardware and software. System components and function. High-resolution MS and MS/MS acquisition modes.

HPLC-MS analysis

Introduction to the HyStar software. Set-up of HPLC methods and preparation of sample tables. Acquisition of LC-MS/MS data.

Atmospheric pressure ionization (API)

Fundamentals of electrospray ionization (ESI). Requirements regarding solvent and buffers, default settings for the ESI source. Basics of APCI, APPI and VIP-HESI, if applicable.

Data analysis

Overview over the DataAnalysis software. General data processing: Recalibration of data, generation of extracted ion chromatograms (EICs), extraction of MS and MS/MS spectra, calculation of elemental compositions (SmartFormula). Advanced features: Different algorithms for feature extraction, CompoundCrawler, FragmentationExplorer, LibraryEditor.

Calibration and tuning of the instrument

Introduction to otofControl software. Mass calibration and tuning of the instrument. Explanation of source and tune parameters. Methods for small molecule analysis.

Maintenance

Guidelines and recommendations for the maintenance of the QTOF instrument. Ion source cleaning.

MS/MS modes and parameters

Applications for different MS/MS modes: Data dependent MS/MS, MRM and bbCID. Parameters for intelligent precursor selection in autoMS/MS mode. In-source CID and pseudo MS³.

Applications

Application-specific questions are discussed upon request.

C3EL33

ESI-QTOF Essential Operator Training Course

Duration

3 Days

Low Molecular Weight Applications including MetaboScape®

Links

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Intention

The course is intended for novice Bruker QTOF users without significant prior experience in data acquisition and / or instrument maintenance. The course covers all important aspects of QTOF operation as well as application-relevant HPLC aspects but does not substitute an explicit HPLC training. It includes a 0.5 day basic training of MetaboScape® software for data processing, annotation of unknown compounds, and statistical analysis.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the QTOF mass spectrometer (compact, impact, maXis) with several weeks of experience with the instrument and the software. Basic knowledge about statistics is of advantage.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Instrument overview

Instrument geometry, theory of the orthogonal time of flight system, accurate mass measurement, MS/MS capabilities of the instrument.

Atmospheric pressure ionization (API)

Fundamentals of electrospray ionization (ESI). Requirements regarding solvent and buffers, default settings for the ESI source. Basics of APCI, APPI and VIP-HESI, if applicable.

Tuning and optimization of the instrument

Calibration and tuning of the instrument, ion transfer, tuning for high sensitivity and high mass accuracy, resolution, mass range and mass accuracy.

Data acquisition

Data acquisition speed depending on sample complexity, HPLC control using HyStar software. Introduction to Metabolomics studies.

MS/MS capabilities

Isolation, fragmentation, auto MS/MS, MRM, intelligent precursor selection, In-source fragmentation, pseudo MS³, broadband CID.

Data Analysis

General data processing and evaluation using DataAnalysis, SmartFormula, basic introduction to the LibraryEditor and ReportDesigner. Introduction to statistical data mining: PCA, t-Test, ANOVA and others. Data handling in MetaboScape®, feature extraction, optimizing processing parameters. Discussion about statistical models in MetaboScape® for different analytical questions.

Metabolite Identification

Identification of compounds with SmartFormula (exact mass, isotopic pattern), retention times and MS/MS spectra by using AQ scoring. Search strategies using additional annotation tools in MetaboScape®, such as Target Lists, and MS/MS spectra libraries (e.g. HMDB, MetaboBase® and personal libraries). Structure elucidation with database searches (e.g. ChemSpider) and in-silico fragmentation.

Maintenance

General maintenance of the QTOF, source maintenance, including dismantling and methods of cleaning.

C3EL43

ESI-QTOF Essential Operator Training Course

Duration
3 Days

Low Molecular Weight Applications including TASQ®

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Intention

The course is intended for novice Bruker QTOF users without significant prior experience in data acquisition, data processing and instrument maintenance. The course covers all important aspects of QTOF operation including application relevant HPLC aspects, but it does not substitute a dedicated HPLC training. It includes a 0.5-day basic training of the TASQ® software for targeted screening and quantification.

Prerequisite

Due to the familiarization during the system installation, participants should have a basic knowledge of the QTOF mass spectrometer (compact, impact, maXis) and some initial experience with the hardware and the software.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Introduction to Bruker QTOF systems

Overview over hardware and software. System components and function. High-resolution MS and MS/MS acquisition modes.

HPLC-MS analysis

Introduction to the HyStar software. Set-up of HPLC methods and preparation of sample tables. Acquisition of LC-MS/MS data.

Atmospheric pressure ionization (API)

Fundamentals of electrospray ionization (ESI). Requirements regarding solvent and buffers, default settings for the ESI source. Basics of APCI, APPI and VIP-HESI, if applicable.

Data analysis

Overview over the DataAnalysis software. General data processing: recalibration of data, generation of extracted ion chromatograms (EICs), extraction of MS and MS/MS spectra, calculation of elemental compositions (SmartFormula).

Calibration and tuning of the instrument

Introduction to otofControl software. Mass calibration and tuning of the instrument. Explanation of source and tune parameters. Methods for small molecule analysis.

Screening and quantitation in TASQ®

Execution of screening and quantitation workflows in TASQ®: batch import, TASQ® method parameters, data review, screening and quantitation workflow.

MS/MS modes and parameters

Applications for different MS/MS modes: Data dependent MS/MS, MRM and bbCID. Parameters for intelligent precursor selection in autoMS/MS mode. In-source CID and pseudo MS³.

Maintenance

Guidelines and recommendations for the maintenance of the QTOF instrument. Ion source cleaning.

C3EP23

ESI-QTOF Essential Operator Training Course

Duration

3 Days

Proteomics

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Intention

The course is intended for novice Bruker QTOF users without significant prior experience in data acquisition, data processing and instrument maintenance. The course covers all important aspects of QTOF operation including application relevant HPLC aspects, but it does not substitute a dedicated HPLC training.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the ESI-QTOF mass spectrometer (compact, impact, maXis) with several weeks of experience with the instrument and the software.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Instrument overview

Instrument geometry, theory of the Bruker QTOF systems, accurate mass, MS²-capabilities.

Data analysis

General data processing, accurate mass, recalibration, deconvolution (including MaxEnt), peaklist generation and export.

Data acquisition

Resolution, calibration. HPLC control using HyStar software.

Database searching

File export options, basics of BioTools and BioPharma Compass[®] software, database search.

Tuning and optimization of the instrument

Calibration and tuning of the QTOF system, ionization mode, ion transfer, tuning for high sensitivity/high resolution or wide mass range.

General maintenance

Source maintenance, including dismantling and methods of cleaning.

MS/MS-experiments

Isolation, fragmentation, Auto-MS², MRM experiments, intelligent precursor ion selection.

Applications

Specific requirements of the customer with respect to the focus of this course will be discussed.

Atmospheric pressure ionization (API)

ESI operation, ionization efficiency, direct infusion, coupling to high and low flow separation instruments (UHPLC and nanoLC).

C3EB13

ESI-QTOF Essential Operator Training Course

Duration
3 Days

BioPharma Compass® Workflows

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Intention

This course is intended for novice users of the Bruker QTOF equipment combined with the software suite BioPharma Compass® without significant prior experience in data acquisition and processing. This course covers all important aspects of QTOF operation and (automated) workflow-based processing with BioPharma Compass® as well as application relevant HPLC aspects but does not substitute an explicit HPLC training.

Prerequisite

Course participants should have attended the system and software familiarization during instrument and BioPharma Compass® server installation and a few weeks of instrument and software use to develop some basic experience with the necessary hardware and software setup.

Course Topics

Instrument overview

Instrument geometry, theory of the orthogonal time of flight system, accurate mass measurement, MS/MS capabilities of the instrument.

Administrative tasks

Basic administrative tasks are shown for BioPharma Compass® software suite including user-, station-, workflow- and method management.

Atmospheric pressure ionization (API)

ESI ionization efficiency, direct infusion, electrolyte and buffer requirements for MS coupling of separation instruments like HPLC or UHPLC.

Automation

BioPharma Compass® is a turnkey solution, meaning that the whole process of acquiring data, analysis of data, report generation and result storage can be executed without the need of user intervention. The workflow and method concept is discussed, samples will be submitted, measured and analyzed. Available tools for inspecting results are shown.

Tuning and maintenance of the QTOF

Calibration and tuning of the QTOF, general maintenance of the QTOF, source maintenance, including dismantling and methods of cleaning.

Reprocessing and validation

The functionality for reprocessing of acquired data sets and validation of obtained results are discussed.

Data acquisition

Setup and method optimization options for measurements of intact protein and peptide mapping samples.

Workflows in detail

Details of the workflows protein screening, top-down ESI, peptide mapping, peptide mapping/PTM comparison, peptide screening, peptide screening/batch comparison are presented and discussed.

Data analysis

General data processing and evaluation using DataAnalysis software.

BioPharma Compass® introduction

Introduction to BioPharma Compass® functionalities and introduction to the supported workflows.

C3ET13

ESI-QTOF Essential Operator Training Course

Duration

3 Days

TargetScreener HR Solution Workflows

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Intention

This course is intended for novice users of the Bruker TargetScreener solution without significant prior experience in data acquisition, data processing and instrument maintenance. The course covers all important aspects of the Bruker TargetScreener solution including application relevant HPLC aspects, but it does not substitute a dedicated HPLC training.

Prerequisite

Due to the familiarization during the system installation, participants should have basic knowledge of the TargetScreener solution.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Introduction to Bruker QTOF systems

Overview over hardware and software. System components and function. High-resolution MS and MS/MS acquisition modes.

HPLC-MS analysis

Introduction to the HyStar software. TargetScreener HPLC methods and preparation of sample tables. Acquisition of LC-MS/MS data.

Atmospheric pressure ionization (API)

Fundamentals of electrospray ionization (ESI). TargetScreener eluent composition for positive and negative ionization mode.

Data analysis

General data processing in DataAnalysis: Recalibration of data, generation of extracted ion chromatograms (EICs), extraction of MS and MS/MS spectra, calculation of elemental compositions (SmartFormula).

Calibration and tuning of the instrument

Introduction to otofControl software. Mass calibration and tuning of the instrument. Explanation of source and tune parameters of the TargetScreener default methods.

Screening and quantitation in TASQ®

Execution of screening and quantitation workflows in TASQ®: batch import and management, TargetScreener method parameters, customization of TASQ® methods, data review, screening and quantitation workflow.

MS/MS modes and parameters

Use of broadband CID (bbCID) acquisition mode for screening and quantification and data dependent MS/MS for the extension of the TargetScreener database.

Maintenance

Guidelines and recommendations for the maintenance of the QTOF instrument. Ion source cleaning.

ESI-timsTOF Operator

Training courses cover the range from instrument control to application driven solution

Essential Operator Training Courses

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C8EL23

ESI-timsTOF Essential Operator Training Course

Duration

3 Days

Low Molecular Weight Applications

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Intention

The course is intended for novice Bruker timsTOF users without significant prior experience in data acquisition and / or instrument maintenance. The course covers all important aspects of timsTOF operation as well as application relevant HPLC aspects but does not substitute an explicit HPLC training. To include MetaboScape® or TASQ® choose courses C8EL33 or C8EL43, respectively.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the timsTOF mass spectrometer with several weeks of experience with the instrument and the software.

Course Topics

Instrument overview

Instrument geometry, theory of the tims-orthogonal time of flight system, accurate mass measurement, MS/MS capabilities of the instrument, introduction to ion mobility separation with tims technology.

Atmospheric pressure ionization (API)

ESI, APCI, APPI, ionization efficiency, positive and negative ion mode ionization, direct infusion, electrolyte and buffer requirements for MS coupling of HPLC and UHPLC.

Tuning and optimization of the instrument

Calibration and tuning of the instrument, ion transfer, tuning for high sensitivity and high mass accuracy, cycle and trigger times, resolution, mass range and mass accuracy, tuning of ion mobility for different resolution modes.

Data acquisition

Data acquisition speed depending on sample complexity, HPLC control using HyStar software, strategies for acquiring data with and without ion mobility.

MS/MS capabilities

Isolation, fragmentation, data dependent MS/MS, MRM, intelligent precursor selection, In-source fragmentation, pseudo MS³, broad band CID.

Data analysis

General data processing and evaluation with DataAnalysis, SmartFormula and quantitation using QuantAnalysis software, basic introduction to the LibraryEditor and ReportDesigner. Heatmap of ion mobility data, extraction of relevant data out of ion mobility datasets, calculation of ion mobility resolution and CCS values.

Maintenance

General maintenance of the timsTOF, source maintenance, including dismantling and methods of cleaning.

C8EL33

ESI-timsTOF Essential Operator Training Course

Duration
3 Days

Low Molecular Weight Applications including MetaboScape®

Links

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Intention

The course is intended for novice Bruker timsTOF users without significant prior experience in data acquisition and / or instrument maintenance. The course covers all important aspects of timsTOF operation as well as application relevant HPLC aspects but does not substitute an explicit HPLC training. It includes a 0.5 day basic training of MetaboScape® software for data processing, annotation of unknown compounds, and statistical analysis.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the QTOF mass spectrometer (compact, impact, maXis) with several weeks of experience with the instrument and the software. Basic knowledge about statistics is of advantage.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Instrument overview

Instrument geometry, theory of the orthogonal time of flight system, accurate mass measurement, MS/MS capabilities of the instrument.

Atmospheric pressure ionization (API)

ESI, APCI, APPI, ionization efficiency, positive and negative ion mode ionization, direct infusion, electrolyte and buffer requirements for MS coupling of HPLC and UHPLC.

Tuning and optimization of the instrument

Calibration and tuning of the instrument, ion transfer, tuning for high sensitivity and high mass accuracy, resolution, mass range and mass accuracy.

Data acquisition

Data acquisition speed depending on sample complexity, HPLC control using HyStar software. Introduction to Metabolomics studies.

MS/MS capabilities

Isolation, fragmentation, Auto MS/MS, MRM, intelligent precursor selection, In-source fragmentation, pseudo MS³, broad band CID.

Data analysis

General data processing and evaluation using DataAnalysis, SmartFormula, quantitation using QuantAnalysis software, basic introduction to the LibraryEditor and ReportDesigner. Introduction to statistical data mining: PCA, t-Test, ANOVA and others. Data handling in MetaboScape®, feature extraction, optimizing processing parameters. Discussion about statistical models in MetaboScape® for different analytical questions.

Metabolite identification

Identification of compounds with SmartFormula (exact mass, isotopic pattern), retention times and MS/MS spectra by using AQ scoring. Search strategies using additional annotation tools in MetaboScape®, such as Target Lists, and MS/MS spectra libraries (e.g. HMDB, MetaboBase® and personal libraries). Structure elucidation with database searches (e.g. ChemSpider) and insilico fragmentation.

Maintenance

General maintenance of the timsTOF, source maintenance, including dismantling and methods of cleaning.

ESI-timsTOF Essential Operator Training Course

Duration

3 Days

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BioPharma Compass® Workflows

Intention

This course is intended for novice users of the Bruker timsTOF instruments combined with the software suite BioPharma Compass® without significant prior experience in data acquisition and processing. This course covers all important aspects of instrument operation and (automated) workflow-based processing with BioPharma Compass® as well as application relevant HPLC aspects but does not substitute an explicit HPLC training.

Prerequisite

Course participants should have attended the system and software familiarization during instrument and had a few weeks of instrument and software use to develop some basic experience with the necessary hardware and software setup.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Instrument overview

Instrument geometry, theory of the orthogonal time of flight system, accurate mass measurement, MS/MS capabilities of the instrument.

Atmospheric pressure ionization (API)

ESI ionization efficiency, direct infusion, electrolyte and buffer requirements for MS coupling of separation instruments like HPLC or UHPLC.

Tuning and optimization of the instrument

Calibration and tuning of the instrument, ion transfer, tuning for high sensitivity and high mass accuracy, resolution, mass range and mass accuracy.

Data acquisition

Setup and method optimization options for measurements of intact protein and peptide mapping samples.

Data analysis

General data processing and evaluation using DataAnalysis software.

BioPharma Compass®

Introduction to BioPharma Compass® functionalities and introduction to the supported workflows.

Administrative tasks

Basic administrative tasks are shown for BioPharma Compass® software suite including the management of users, stations, workflows and methods.

Automation

BioPharma Compass® is a turnkey solution, meaning that the whole process of acquiring data, analysis of data, report generation and result storage can be executed without the need of user intervention. The workflow and method concept is discussed, samples will be submitted, measured and analyzed. Available tools for inspecting results are shown.

Reprocessing and validation

The functionality for reprocessing of acquired data sets and validation of obtained results are discussed.

Workflows in detail

Details of the workflows protein screening, top-down ESI, peptide mapping, peptide mapping/PTM comparison, peptide screening, peptide screening/batch comparison are presented and discussed.

C8EP23

ESI-timsTOF Essential Operator Training Course

Duration

3 Days

Proteomics

Links

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Intention

The course is intended for novice Bruker timsTOF users without significant prior experience in data acquisition and / or instrument maintenance. The course covers all important operation and application relevant topics for instruments of the timsTOF family coupled to nano HPLC instruments.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the timsTOF mass spectrometer and LC set-up.

Course Topics

Instrument overview

Instrument geometry including the principle of ion mobility separation with tims and the time-of-flight (TOF) system. Introduction to different PASEF scan modes.

Captive spray

Practical aspects of using the captive spray ion sources for nanoflow applications.

Tuning and optimization of the instrument

TIMS and TOF calibration. PASEF method parameter optimization using timsControl.

Data acquisition

HPLC control using HyStar software. Optimization of methods for shotgun proteomics using timsControl software:

- General overview over MS and MS/MS parameters including different MS/MS capabilities, e.g. data dependent PASEF, data independent PASEF and parallel reaction monitoring PASEF
- Adjustment of MS and MS/MS relevant parameters according to sample complexity and aim of the analysis

Data analysis

Manual inspection of acquired data in DataAnalysis, including heatmap of ion mobility data. Processing of proteomics datasets, preparation for database searches, and label free quantitation workflows.

Maintenance

General maintenance of the timsTOF, source maintenance and exchange, including dismantling and cleaning.

General nanoElute® maintenance and troubleshooting.

General discussion about sample handling according to the application (e.g. low sample amount on SCP/Ultra).

ESI-timsTOF Essential Operator Training Course

Duration

3 Days

TargetScreener 4D Solution Workflows

Links[Registration Form](#)[Table of Contents](#)[Training Course](#)[Index](#)**Intention**

This course is intended for novice users of the Bruker TargetScreener 4D solution without significant prior experience in data acquisition, data processing and instrument maintenance. The course covers all important aspects of the Bruker TargetScreener 4D solution including application relevant HPLC aspects, but it does not substitute a dedicated HPLC training.

Prerequisite

Due to the familiarization during the system installation, participants should have basic knowledge of the TargetScreener 4D solution.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Introduction to TIMS-HRMS

Instrument geometry, theory of trapped ion mobility spectrometry (TIMS)- high-resolution mass spectrometry (HRMS), accurate mass measurement, MS/MS capabilities of the instrument, introduction to ion mobility separation with TIMS technology.

Atmospheric pressure ionization (API)

Fundamentals of electrospray ionization (ESI). TargetScreener eluent composition for positive and negative ionization mode.

Calibration and tuning of the instrument

Introduction to the timsControl software. Overview of MS and TIMS parameters. Mass and ion mobility calibration. Explanation of source and tune parameters of the TargetScreener default methods.

MS/MS modes and parameters

Use of broadband CID (bbCID) acquisition mode for screening and quantification and data dependent MS/MS for the extension of the TargetScreener database.

HPLC-MS analysis

Introduction to the HyStar software. TargetScreener HPLC methods, preparation of sample tables, data acquisition.

Data analysis

General data processing in DataAnalysis: Recalibration of mass and mobility dimensions, generation of extracted ion chromatograms (EICs) and extracted ion mobilograms (EIMs), extraction of MS and MS/MS spectra, calculation of elemental compositions (SmartFormula). Heatmap of ion mobility data, calculation of ion mobility resolution and CCS values.

Screening and quantitation in TASQ®

Processing of bbCID data in TASQ®: batch import and management, TargetScreener method parameters, customization of TASQ® methods, data review, performing screening and quantitation workflow.

Maintenance

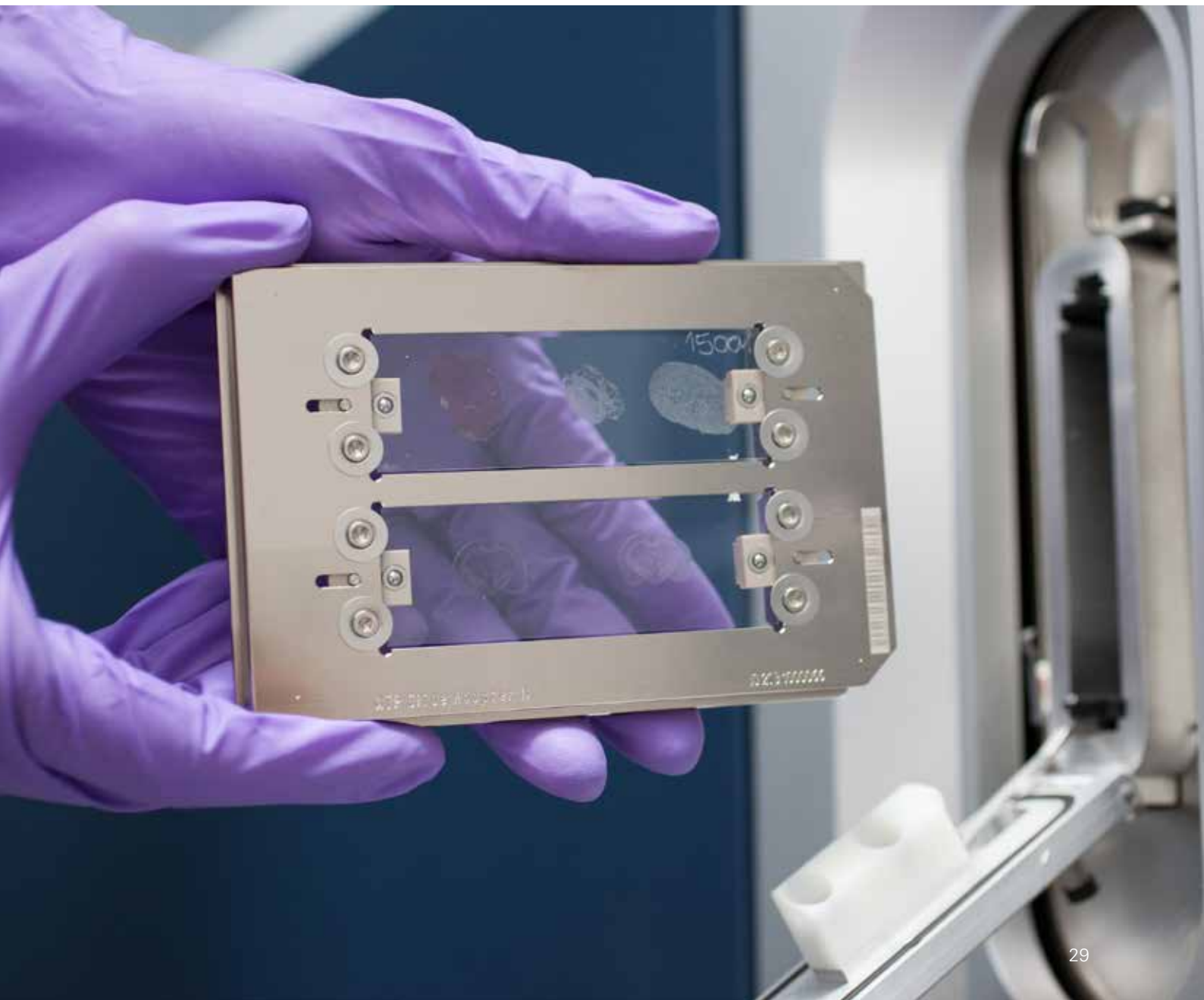
Guidelines and recommendations for the maintenance of the timsTOF instrument including ion source cleaning.

ESI-timsTOF fleX Operator

Training courses cover the range from instrument control to application driven solution

Essential Operator Training Courses

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ESI-timsTOF fleX Essential Operator Training Course

Duration

3 Days

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MALDI Imaging

Intention

This course is intended for beginners in the field of MALDI Imaging and will provide a comprehensive introduction to the entire workflow. The course is focused on the mass spectrometric analysis of tissue sections using the Bruker timsTOF fleX hardware and software.

Prerequisite

Any detailed knowledge in mass spectrometry and / or histology is required to attend the course. Basic familiarity with Bruker's MALDI instruments and a general understanding of the MALDI Imaging concept would be helpful. A substantial part of the course will be conducted in a level 2 biosafety lab (factory course).

Course Topics

Introduction

Introduction to MALDI mass spectrometry. Concepts of MALDI Imaging and the MALDI Imaging workflow.

Image acquisition

Introduction to flexImaging software and automatic image data acquisition. flexImaging software training: guided tour of all program features, including hands-on training.

Sample preparation

Sample preparation considerations regarding requirements to transportation and storage of good quality tissue samples. Cryosectioning: Introduction and hands-on training.

Automation

Batch acquisition of multiple MALDI images.

Matrix deposition

Matrix selection guidelines, basics of HTX M3+ sprayer instrument operation.

Instrumentation

MALDI timsTOF flex instrument operation (TIMS off). Basics of timsControl software, method optimization for MALDI Imaging, calibration. Hands-on training for HTX M3+ sprayer, including troubleshooting and method development guidelines. MALDI timsTOF flex instrument operation (TIMS on): Adjustment of timsControl software methods with TIMS on, method optimization for MALDI Imaging, calibration.

TQ Operator

Training courses cover the range from instrument control to application driven solution

Essential Operator Training Courses

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C6EA23

LC-MS TQ Essential Operator Training Course

Duration

3 Days

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Intention

This course is intended for novice Bruker EVOQ® LC-MS Triple Quadrupole series (EVOQ® Qube, EVOQ® Elite, EVOQ® Elite ER) users without significant prior experience in data acquisition and / or instrument maintenance. This course covers all important aspects of EVOQ® TQ operation as well as application relevant LC aspects but does not substitute an explicit LC training.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the triple quad mass spectrometer with several weeks of experience with the instrument and the software.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Instrument overview

Familiarization with the LC-MS TQ system, theory of the quadrupole systems, different scan modes.

Atmospheric pressure ionization (API)

Electrospray Ionization (ESI) and Atmospheric Pressure Chemical Ionization (APCI) operation, ionization efficiency, heated ESI characteristics.

Calibration and Tuning

Instrument tuning: mass and detector calibration

Direct instrument control and data acquisition

Direct instrument control using tqControl and HyStar. Usage of the MRM-builder. Creation of acquisition methods for different scan modes. Offline and online batch management.

Data processing and analysis in tqControl

Method processing parameters, data revision, quantitation workflow and quantitation options, reporting.

Maintenance

Good working conditions (solvents, containers, nitrogen etc.), cleaning of the ion source, changing probes and capillaries.

Applications

Individual questions and specific requirements with respect to the focus of this course will be discussed.

C6EA13

GC-MS TQ Essential Operator Training Course

Duration

3 Days

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Intention

This course is intended for novice Bruker EVOQ® GC-MS Triple Quadrupole series users without significant prior experience in data acquisition and / or instrument maintenance. This course covers all important aspects of EVOQ® TQ operation as well as application relevant GC aspects but does not substitute an explicit GC training.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the triple quad mass spectrometer with some experience with the instrument and the software.

Please note: This training does not replace a dedicated GC training!

Course Topics

Instrument overview

Instrument overview, GC-injectors, injection methods, theory of the quadrupole systems, different scan modes.

Electron impact ionization (EI)

Principle of ion formation, ionization efficiency, in source fragmentation.

Advanced inlet techniques (on request)

Headspace Injection, ChromatoProbe.

Calibration and Tuning

Instrument tuning: mass and detector calibration

Direct instrument control and data acquisition

Direct instrument control using tqControl and HyStar. Usage of the MRM-builder. Creation of acquisition methods for different scan modes. Offline and online batch management.

Data processing and analysis in tqControl

Method processing parameters, data revision, quantitation workflow and quantitation options, reporting.

Maintenance

General maintenance of the GC and the mass spectrometer, source maintenance, including dismantling and methods of cleaning.

Applications

Specific requirements of the customer with respect to the focus of this course will be discussed.

C7EA11

GC-APCI Essential Operator Training Course

Duration

1 Day

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Intention

This course is intended for users of Bruker QTOF series, which like to expand their scope into GC APCI coupling. This course covers all important aspects of GC APCI ion source operation as well as application relevant GC aspects but does not substitute an explicit GC training.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the QTOF HR mass spectrometer with some experience with the instrument and the software.

Please note: This training does not replace a dedicated GC training!

Course Topics

Instrument overview

Instrument overview, GC-injectors, injection methods, GC APCI process, dry and wet measurement conditions.

Maintenance

General maintenance of the GC and the mass spectrometer, source maintenance, including dismantling and methods of cleaning.

Atmospheric Pressure Chemical Ionization (APCI)

Principle of ion formation, ionization efficiency, in source fragmentation.

Applications

Specific requirements of the customer with respect to the focus of this course will be discussed.

Calibration and tuning

Instrument tuning: mass and detector calibration

Direct instrument control and data acquisition

Direct instrument control using otofControl and HyStar.

Data processing and analysis in Data-Analysis

Method processing parameters, data revision, or quantitation are NOT a part of this training.

MRMS Operator

Training courses cover the range from instrument control to application driven solution

Onsite Operator Training Courses

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Application Training Courses

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C4EG13

MRMS Operator Onsite Training Course

Duration

3 Days

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Intention

This course is the basic training course for operation of the MRMS instrument. In addition to basic instrument handling, please book a suitable application course (C4EI12, C4EL12, C4EP12, C4EB12) for a full five-day training. The course will be held at the customer's site using the installed instrumentation. This ensures that all applications trained during the course will for sure be applicable on the local installation.

Prerequisite

Prerequisites depend on the actual training course content and should be discussed with the responsible application specialist from Bruker in advance of the training.

Course Topics

Introduction

Theory of MRMS and basic operation of the MRMS instrument with its control software

Method handling and data acquisition

Familiarization and method handling in ftmsControl, flexImaging and Hystar Software (optional for LCMS)

ESI and MALDI

ESI (Electrospray ionization) as well as MALDI measurements of standard compounds

Data analysis

General data processing in DataAnalysis

Calibration and tuning

ParaCell™ shimming, mass calibration, as well as tuning of ion source and ion transfer parameters for low, medium and high m/z ranges in positive and negative ion mode.

MS operation

Mass resolution, speed, scan range, Continuous Accumulation of Selected Ions (CASI), quadrupole isolation and fragmentation options

Duration

2 Days

MALDI Imaging

Links[Registration Form](#)[Table of Contents](#)[Training Course](#)[Index](#)**Intention**

This training course is intended for novice Bruker solariX or scimaX® series users without significant prior experience in MALDI Imaging experiments. Slide preparation, data acquisition, data analysis and instrument handling are included. The course covers all important aspects of data acquisition and data analysis for MALDI Imaging applications.

Prerequisite

A MRMS Essential Operator Training Course should be passed before attending a MALDI Imaging training course.

Location

This course is offered onsite using the customer's MRMS system.

Course Topics

Introduction

Theory of MALDI Imaging on the solariX or scimaX® instrument series.

Sample preparation

Standard tissue cutting on cryotome, application of matrix using the HTX M3+ sprayer, application of standards.

Calibration and tuning

Mass calibration, tuning of ion transfer and ICR cell with special focus on analytes of interest (lipids/metabolites/peptides).

MS operation

flexImaging and mrmsControl familiarization, mass resolution, speed, scan range, quadrupole isolation, Continuous Accumulation of Selected Ions (CASI).

Method handling and data acquisition

Method handling with the control software and DataAnalysis. Set-up and accomplishment for MALDI Imaging analyses.

Data analysis including database searching

General data analysis in SCiLSTM Lab, file export options, basics of MetaboScape®, data transfer between SCiLSTM Lab and MetaboScape®.

Applications

Workflow for lipid or metabolite (if preferred peptide) and MALDI Imaging experiments on tissue.

Duration

2 Days

Metabolomics

Links[Registration Form](#)[Table of Contents](#)[Training Course](#)[Index](#)**Intention**

This training course is intended for novice Bruker solarix or scimaX® series users without significant prior experience in metabolomics experiments. The course covers all specific aspects of data acquisition and data processing for metabolomics applications as well as application relevant HPLC aspects for metabolomics and small molecule applications such as lipids but does not substitute an explicit HPLC training.

Prerequisite

A MRMS Essential Operator Training Course should be passed before attending a metabolomics training course.

Location

This course is offered onsite using the customer's MRMS system.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Introduction

Data acquisition of metabolomic samples including data processing using the MRMS instrument.

ESI and MALDI

ESI (Electrospray ionization) as well as MALDI measurements of different samples using positive and negative ion modes.

Calibration and tuning

Mass calibration, tuning of ion source and ion transfer parameters for these kind of samples in positive and negative ion mode.

MS operation

Mass resolution, speed, scan range, method handling, Continuous Accumulation of Selected Ions (CASI), quadrupole isolation and fragmentation options.

Method handling and data acquisition

Method handling with the control software, HyStar and DataAnalysis. Direct infusion measurements of standard metabolomic samples (polar compounds and lipids). Flow injection analysis (FIA) and LC-MS when required.

Data analysis

General data processing in DataAnalysis, processing of single spectra generated by MALDI, ESI or FIA experiments, SmartFormula calculation, MetaboScape® workflow of FIA and LC-MS data.

Applications

Analysis of metabolomic samples such as tea and coffee extracts in MetaboScape®. Specific requirements of the customer with respect to the focus of this course will be discussed.

Duration

2 Days

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Petroleomics

Intention

This training course is intended for novice Bruker solarix or scimaX® series users without significant prior experience in petroleomics experiments. The course covers all important aspects of data acquisition and data processing for petroleomics applications using different ionization techniques such as APPI, APCI and LDI.

Prerequisite

A MRMS Essential Operator Training Course should be passed before attending a petroleomics training course.

Location

This course is offered onsite using the customer's MRMS system.

Course Topics

Introduction

Data acquisition of petroleomics samples including data processing using the MRMS instrument.

Atmospheric pressure ionization (API) and LDI

API techniques (ESI/APCI/APPI) as well as laser desorption ionization (LDI), ionization efficiency, direct infusion (DI) and flow injection analysis (FIA) (optional).

Calibration and tuning

Mass calibration, tuning of ion source and ion transfer parameters for these kind of samples in positive and negative ion modes.

MS operation

Mass resolution, detection range, method handling, Continuous Accumulation of Selected Ions (CASI), quadrupole isolation and CID fragmentation.

Method handling and data acquisition

Method handling with the control software and mrmsControl, HyStar (optional for FIA) and DataAnalysis. Acquisition of petroleomics data via APPI and LDI.

Data analysis

General data processing in DataAnalysis, processing of petroleomics spectra with 3rd party software such as Composer* or PetroOrg** software. Generation of specific plots such as DBE vs. C, Van Krevelen plots etc. Export of processing results as Excel sheets.

Applications

Analysis of petroleomics samples using LDI as well as APCI and APPI via direct infusion experiments. Specific requirements of the customer with respect to the focus of this course will be discussed.

* Composer is a product of Sierra Analytics, Modesto, CA 95356 USA

** PetroOrg is a product of National High Magnetic Field Laboratory, Tallahassee, Florida

Duration

2 Days

Biomolecules

Links[Registration Form](#)[Table of Contents](#)[Training Course](#)[Index](#)**Intention**

This training course is intended for novice Bruker solarix or scimaX® series users without significant prior experience in biomolecule experiments. The course covers all important aspects of data acquisition and data processing for biomolecule applications using MALDI and ESI, as well as different fragmentation techniques such as CID, ETD and ECD.

Prerequisite

A MRMS Essential Operator Training Course should be passed before attending a metabolomics training course.

Location

This course is offered onsite using the customer's MRMS system.

Course Topics

Introduction

Data acquisition of biomolecule samples including data processing using the MRMS instrument.

ESI and MALDI

ESI (Electrospray ionization) and MALDI (Matrix-assisted laser/desorption ionization) measurements of different biomolecule samples. Fragmentation techniques: Collision Induced Dissociation (CID), Electron Transfer Dissociation (ETD) and Electron Capture Dissociation (ECD) of peptides and proteins.

Calibration and tuning

Mass calibration, tuning of ion source and ion transfer parameters for these kind of samples in positive and negative ion mode.

MS operation

Mass resolution, detection range, method handling, Continuous Accumulation of Selected Ions (CASI), quadrupole isolation, CID, ETD and ECD fragmentation.

Method handling and data acquisition

Method handling with the control software and mrmsControl, HyStar (optional for LCMS) and DataAnalysis. Acquire protein digest spectra and generate MS/MS fragmentation data.

Data analysis

General data processing in DataAnalysis, processing of peptide mass fingerprint (PMF) and fragmentation data (CID, ETD and ECD) in BioTools. Database search via MASCOT.

Applications

Analysis of biomolecule samples using MALDI and ESI. Specific requirements with respect to the focus of the course will be discussed.

ESI Ion Trap Operator

Training courses cover the range from instrument control to application driven solution



C2EL13

Ion Trap Essential Operator Training Course

Duration

2.5 Days

Low Molecular Weight Applications

Links

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Intention

This training course is intended for novice Bruker ion trap users without significant prior experience in data acquisition, data analysis and instrument maintenance. The course covers all important aspects of ion trap operation and data processing as well as application relevant HPLC aspects but does not substitute an explicit HPLC training.

Prerequisite

Due to the familiarization during system installation, attendees should have a basic knowledge of the ion trap mass spectrometer with several weeks of practical experience with the instrument and software.

Please note: This training does not replace a dedicated HPLC training!

Course Topics

Introduction

Theory of the ion trap mass spectrometry and atmospheric pressure ionization (API) techniques.

Atmospheric pressure ionization (API), Electrospray Ionization (ESI) and alternative API techniques (IonBooster/APCI/APPI), ionization efficiency, direct infusion and HPLC-ESI-MS coupling.

Calibration and tuning

Calibration (e.g. detector, scan modes), tuning of the ion transfer with special focus on small molecules, positive/negative switching.

Ion trap and MS(n) operation

Scan modes, resolution and speed, scan range, Ion Charge Control (ICC), MS(n) capabilities of the ion trap, isolation and fragmentation options, Manual MS(n), MRM and data dependent MS(n) with intelligent precursor ion selection.

Method handling and data acquisition

Method handling in trapControl, HyStar and DataAnalysis. Set-up and accomplishment of HPLC MSⁿ analyses.

Data analysis

General data processing in DataAnalysis, chromatogram trace definitions and MS(n) spectra extraction, FindCompounds algorithm, basic introduction to library search applications, QuantAnalysis™ software.

Maintenance

Good working conditions (solvents, containers, nitrogen etc.), cleaning of the ion source.

Applications

Small molecule analysis using LC-MS(n). Specific requirements of the customer with respect to the focus of this course will be discussed.

C2EX13

Toxtyper[®] Essential Operator Training Course

Duration

2,5 Days

Toxtyper[®] Routine Workflows

Links

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Intention

This training course is intended for novice users of the Bruker Toxtyper[®]. It enables participants to perform the standard Toxtyper[®] screening workflow. The course covers all important aspects of Toxtyper[®] sample analyses, routine maintenance, instrument performance verification and Toxtyper[®] QC measurements.

Another component of the training is the expansion of Toxtyper[®] libraries with new drug compounds.

Prerequisite

Attendees should have a basic knowledge of LCMS coupling and the analysis of toxicological or forensic samples.

Course Topics

Introduction

Introduction to HPLC and ion trap hardware as well as general features of the Toxtyper[®] software.

Toxtyper[®] ion trap calibrations

After a brief introduction to the trapControl software calibrations of detector, scan calibration and isolation/fragmentation are performed.

Toxtyper[®] workflow

Execution of the Toxtyper[®] workflow according to the Toxtyper[®] user tutorial. This includes LC-MS system setup, quality control samples, result interpretation based on real life samples and standby conditions.

Troubleshooting

Information on error handling is provided.

Routine Toxtyper[®] ion trap performance tests

Weekly recommended maintenance tests of the system are trained: ESI source maintenance, detector check, and Toxtyper[®] routine performance tests.

Additional topics on request

As add-ons more information on ESI and ion trap mass spectrometry can be given. Besides that, administrator options are discussed.

UHPLC Operator

Training courses cover the range from instrument control to MS coupling

Essential Operator Training Courses

45



C5EL12

Elute+ UHPLC Essential Operator Training Course

Duration

2 Days

Links

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Intention

This course is intended for novice users of the Bruker Elute+ UHPLC System without significant prior experience in liquid chromatography. The course covers all important aspects of the Elute+ UHPLC System including application relevant aspects.

Prerequisite

Since this course is intended as dedicated HPLC-training prior knowledge about liquid chromatography is of advantage, but not a prerequisite.

Course Topics

Basics in Chromatography

Introduction to basic principles of chromatographic techniques.

Elute+ UHPLC System

Structure and working principles of the Elute+ UHPLC Pump. Working principle of the Elute+ Autosampler including different injections modes and wash routines. Overview over Elute+ UHPLC Column Oven.

HyStar Software

Introduction to the HyStar Software: Basic overview, creating separation methods and sample tables, data acquisition, quick data review and error handling.

Good Working Conditions

Good Working Conditions for daily operation and system idle mode. Recommendations for flow path cleaning.

Application Workflow Example

Introductions for preparing pump, autosampler and column oven for daily operation. Instructions for setting up new sample tables, column equilibration and starting the acquisition. Recommendations for column storage and shutdown settings.

Method Development

Fundamentals of method development including isocratic and gradient elution, solvents and pH of mobile phases and influence of parameters such as gradient conditions and flow rates.

SPR Operator

Training courses cover the range from instrument control to application driven solution

Essential Operator Training Courses

47

Onsite Operator Training Courses

48



D1EX01

SPR Essential Operator Training Course

Duration
2 Days

SPR Pro Instruments

Links

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Intention

This training course focuses on the basics of practical Surface Plasmon Resonance (SPR) operation with focus on the determination of kinetic constants. The course covers the essentials of sample preparation, data acquisition/processing and instrument maintenance. Thus, the course will enable novice users getting started with SPR analyses.

The course will be held onsite of the customer using the installed instrumentation. This ensures that all applications trained during the course will for sure be applicable on the local installation.

The number of customers trained during this training is defined by the customer's requirements. However, for practical and didactical reasons, groups should not get

larger than 5 trainees.

Prerequisite

Basic general knowledge in SPR is highly recommended and lab experience required. Attendees of the training course are encouraged to take part in the user familiarization that is done at a customer site upon installation of the SPR instrument.

Required infrastructure onsite

Access to the system, max. 5 people per training.

Customer provides general lab equipment and access to ddH₂O.

Course Topics

The training content in its fullest extend would be as following:

Basics in SPR

Basic training on the theory of SPR and the different applications with SPR. Individual questions and specific requirements with respect to the focus of this course will be discussed.

Instrument overview

Familiarization with the SPR systems and its features for the different applications as well as the handling of the instrument.

General maintenance of the SPR instrument, including methods of cleaning and cleaning routines.

Data acquisition software training

Introduction into the handling of the data acquisition software (SPR Control Software) and joint generation of selected basic methods.

Practical training

Practical training on system with two kinetic test assays (incl. method programming and sample handling).

The experiments include coverage of method creations incl. racks, sensor docking and precondition, pH-scouting, protein immobilization and kinetic experiment.

Data analysis

General data processing and evaluation using Sierra SPR Analyzer Software, introduction to SPR analysis software and practical training on data analysis from the obtained assay data. Discussion of application specific software questions.

D3AX01

SPR Individual Operator Onsite Training Course

Duration

Up to 3 Days

Links

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Intention

This training course focuses on your individual needs and will cover the topics that you request upfront.

From a simple operator refresh training to a deep dive into Analyzer and Control Software over a focus on assay optimization to method development for your specific application, the course will be individually fitted.

Prerequisite

Attendees need to have completed the basic SPR Essential Training Course and participated in the user familiarization done at a customer site upon installation of the SPR instrument.

Not more than 5 attendees for practical work!

Required infrastructure

Sample material for the application of interest has to be provided by the customer.

Course Topics

The training content will be fitted to your individual needs and can feature:

Assay discussion (virtual)

We discuss your application 4-6 weeks before the actual training in a virtual meeting. This meeting serves the purposes to define the scope of the training and identify necessary reagents for the assay. These should then be organized by the customer until the onsite training takes place.

Theoretical introduction to application

The theoretical background for the specific training application is discussed in-depth in a lecture (1-2 hours) in a virtual meeting. A recording is then provided to the customer.

Assay development and optimization support

Our specialists support you with initial assay development or assay optimization and show you methods to make assay development for SPR Pro instruments easier and more comfortable.

Specific application training

The training focuses on a specific application discussed upfront. This training is done with customer samples and should enable the user to eventually perform as well as improve the assay of interest independently. An extensive assay optimization may be included, but is not necessary.

Specific application trainings are offered for these applications:

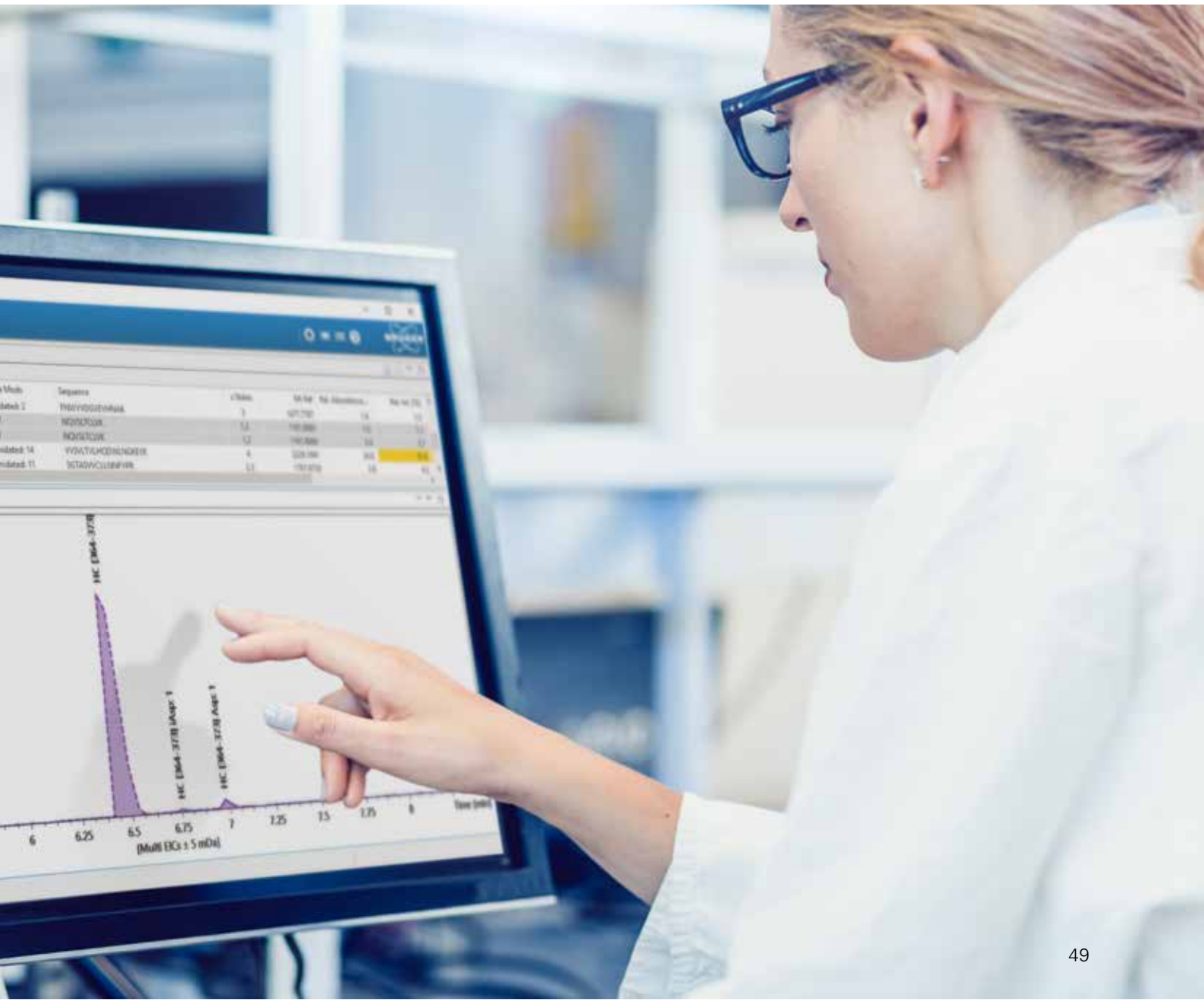
- Concentration Analysis
- Kinetic Assay for Protein-protein Interactions
- Kinetic Assay for Small Molecule-protein Interactions
- Thermodynamics
- Screening
- Conditional Binding
- Epitope Binning

Software courses

Training courses cover different software in depth for comprehensive knowledge and maximized efficiency

Online Operator/Inhouse Training Courses

50



Duration

2 x 0.5 Days -
[online](#)

Statistical analysis of MALDI imaging data using SCiLS™ Lab software

Links

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Intention

This training course provides a comprehensive introduction to the statistical analysis of imaging mass spectrometry data using the SCiLS™ Lab software.

Prerequisite

Attendees should be well familiar with the principle of imaging mass spectrometry. Users of Bruker MALDI mass spectrometers, ideally, should have completed an Essential Operator Training course MALDI Imaging.

Course Topics

Introduction and data import

Introduction to the data import, general software functionalities, user interface and main supported workflows.

Managing data in SCiLS™ Lab

Feature table computation. Adjusting general settings and file properties. Finding list of spectral features, normalizing data, handling and visualization of spectra and ion images.

Processing data with SCiLS™ Lab

Fully automated pipeline for unsupervised, multivariate analysis of imaging data (Segmentation). Application of further statistical methods of univariate and multivariate, unsupervised and supervised statistical data analysis (ROC, component analysis, colocalization analysis). Semi-supervised classification of spectra cohorts based on statistical models. Analyte quantitation based on dilution series.

Overview on workflows and extensions

SpatialOMx®, integration with digital pathology annotations, integration with Metaboscape® feature annotation tool, application programming interface (API).

Exporting data analysis results

Exporting options to Bruker or vendor neutral file formats.

Duration

0.5 Days -
[online](#)

Polymer analysis using PolyTools

Links

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Intention

This training course addresses users of Bruker MALDI-TOF/TOF instruments working in the field of synthetic polymer analysis. The course focuses on Bruker's PolyTools software and how to use it for the in-depth analysis of MS and MS/MS data obtained from polymer samples.

Prerequisite

Participants should have a basic knowledge of mass spectrometry-based workflows applied to polymer analysis.

Course Topics

Introduction and data import

Introduction PolyTools top-level functionalities and introduction of the main workflows which are supported.

Feature table computation

Definition of processing parameters to perform peak picking, retention time alignment, deconvolution, data recalibration, and recursive feature extraction.

Feature finding

Characterization of polymers based on their key features such as number-average molar mass M_n , mass-average molar mass M_w and dispersity. Analysis of end groups is discussed.

Statistics

Advantages of various Kendrick Mass Plots are explained: Standard KMD plot with the resolution enhanced option (KMD vs m/z), Kendrick Mass Defect vs Remainder of Nominal Kendrick Mass (RNKM), Remainders of Kendrick Mass (RKM) vs. m/z - Remainders of Kendrick Mass (RKM) vs. Remainder of Nominal Kendrick Mass (RNKM).

Data revision, filter, and export options

The influence of parameter settings for the graphical display as well as data exporting for further data analysis are demonstrated.

Duration

2 x 0.5 Days -
online

MetaboScape®

Links

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Intention

For users familiar with Bruker ESI-QTOF systems, timsTOF systems (including imaging data acquired on timsTOF flex) or MRMS systems who want to successfully use the MetaboScape® software for statistical analysis and compound identification in Metabolomics applications.

Prerequisite

Attendees should have a basic knowledge of ESI-QTOF or MRMS mass spectrometry with several weeks of experience with the instrument and the software. Additionally, they should have attended an Essential Operator Training course "Low molecular weight applications", previously. Basic knowledge about statistics is of advantage.

Course Topics

Introduction and Data Import

Introduction to the general software functionalities and main supported workflow. Steps to import Data-Dependent-Acquisition (DDA) experiments and definition of sample groups for statistics.

Feature table computation

Definition of processing parameters to perform peak picking, retention time alignment, deconvolution, data recalibration, and recursive feature extraction.

Feature annotation

Identification of compounds using different tools, such as matching with spectral libraries, target lists, SmartFormula and SmartFormula3D, Biotransformer, rule-based lipid annotation, CompoundCrawler, and in silico fragmentation using MetFrag.

Statistics

Use of statistical tests included in MetaboScape® such as for univariate statistics (t-Test/Wilcoxon test, ANOVA/Kruskal-Wallis test), and multivariate statistics (Principal Component Analysis, Partial Least Square, hierarchical clustering).

Pathway mapping

Targeted search of identified compounds in pathways of interest using a built-in MetaboScape® tool.

Data revision, filter, and export options

Introduction to the tools to differentially visualize data with graphs, as well as to filter features based on various rules using flags or direct exclusion before data exporting.

Duration

2 x 0.5 Days -
online

TASQ®

Links

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Intention

This training course addresses users of Bruker mass spectrometry instruments working in the field of screening applications. The course focuses on Bruker's TASQ® software and how to use it for organizing, and analyzing screening data.

Prerequisite

For users familiar with Bruker ESI-QTOF, ESI-timsTOF or ESI-TQ systems who want to use the TASQ® software for screening and quantitation applications.

Course Topics

Introduction

Introduction to the TASQ® workflows, prerequisites for data processing and most important functionalities.

General workflow

The general workflow of importing, processing, reviewing and quantitation of batches will be demonstrated.

Creating processing methods

The general method setting as well as analyte specific screening, scoring, integration, and quantitation settings are explained.

Quantitation options

The different quantitation options regular curve calibration with and without internal standards, single-point calibration, legacy calibration, surrogate quantitation, and standard addition will be demonstrated.

Reporting

Batch and analysis reports will be created.

Duration

2 x 0.5 Days -
online

BioPharma Compass[®]

Links

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Intention

This training course addresses users of Bruker mass spectrometry instruments working in the field of proteomic analysis. The course focuses on Bruker's BioPharma Compass[®] software and how to use it for organizing, analyzing, and archiving of proteomics and glycomics data.

Prerequisite

Participants should have a basic knowledge of mass spectrometry-based workflows applied to proteomics / protein analysis.

Course Topics

Introduction

Introduction to BioPharma Compass[®] top-level functionalities and introduction of the main workflows which are supported.

Reprocessing and validation

The functionality for reprocessing of acquired data sets and validation of obtained results are discussed.

Administrative tasks

Basic administrative tasks include user-, station-, workflow- and method management.

Workflows in detail

Details of the workflows Protein Screening, Top-Down ESI, Peptide Mapping, Peptide Mapping/PTM Comparison, Peptide Screening and Peptide Screening/Batch Comparison are presented.

Automation

BioPharma Compass[®] is a turnkey solution, meaning that the whole process of acquiring data, analysis of data, report generation and result storage is executed without the need of user intervention. In this section it is explained how this automation is implemented. The workflow and method concept is discussed, samples will be submitted, measured and analyzed. Finally, the available tools for inspecting results are customized and used.

D2AX01

SPR Software Online Training Course

Duration
0.5 Days

SPR Pro Instruments,
Analyzer and Control Software

Links

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Intention

This training course focuses on the introduction into the acquisition and analysis software of Bruker SPR (Control and Analyzer).

The course covers the essentials of how to create racks and methods with examples for the Control Software. Additionally, the essentials in how to perform a kinetic and quantification analysis including examples with the Analyzer Software are discussed.

Recommended for new users in your group.

Prerequisite

Internal resources to train the attendee on the practical handling with the Bruker SPR Pro instrument.

Required infrastructure remote

Access to both the Control and Analyzer Software can be beneficial, but is not needed.

Course Topics

The training content in its fullest extend would be as following:

Data acquisition software training

Introduction into the handling of the data acquisition software (SPR Control Software) and joint generation of selected basic methods.

Data analysis

General data processing and evaluation using Sierra SPR Analyzer Software, introduction to SPR analysis software and practical training on data analysis from assay data. Discussion of application specific software questions.

Onsite Training Courses

Duration

Depends on the requirements different options available 2, 3, 4 or 5 Days

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General

Intention

Nearly all courses are offered onsite at the customer facility as well. Each course can be tailored for the specific needs and requirements of the customers.

The course will be held onsite at the customer facility utilizing their installed instrumentation. This ensures that all the relevant applications the customer would like to cover during the course will be applicable on the local installation. The number of customers trained during this training is

defined by the customer's requirements.

However, for practical and didactical reasons, groups should not be any larger than 6 trainees.

Prerequisite

Prerequisites depend on the actual training course content and should be discussed with the responsible application specialist from Bruker in advance of the training.

Course Topics

As these training courses are specifically tailored according to our customer's requirements, a general course outline cannot be provided. This depends on instrument, topics to be covered as well as duration of the course and will be discussed with the Bruker application specialist in advance of the training course. Check for language availability.

Individual Onsite Training Courses	MALDI-TOF	Ion Trap	QTOF	timsTOF	timsTOF fleX	MRMS	GC-TQ	LC-TQ
2 Days	S1AA02	S2AA02	S3AA02	S8AA02	S8AA02	S4AA02	S6AA02	S7AA02
3 Days	S1AA03	S2AA03	S3AA03	S8AA03	S8AA03	S4AA03	S6AA03	S7AA03
4 Days	S1AA04	-	S3AA04	S8AA04	S8AA04	S4AA04	-	-
5 Days	S1AA05	-	S3AA05	S8AA05	S8AA05	S4AA05	-	-



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