Spatial Omics School
Preliminary Programme

Modules 1-3 | November 2026 - April 2027

This programme is preliminary and may be adjusted. A detailed programme will be provided before the start of each module. Coffee breaks will be included on each course day. One social event is planned during each module week, with details to be confirmed.

Module	Dates	Main focus
Module 1	9-12 November 2026 & 27 November 2026 (online session)	Foundations of Spatial Transcriptomics and Visium HD Workflows
Module 2	1-5 February 2027	Spatial Multiomics, Data Workflows and Integration
Module 3	26-30 April 2027	Spatial omics across scales

Module 1 - Munich | 9-12 & 27 November 2026
Foundations of Spatial Transcriptomics and Visium HD Workflows

Objective: provide an overview of spatial transcriptomics technologies and hands-on training with the 10x Genomics Visium HD workflow, from tissue sectioning to library preparation and no-code data analysis.

Day 1 - Monday, 9 November 2026: Foundations of Spatial Transcriptomics: Experimental Design, Correct Sampling and Sectioning

10:00-12:00	General introduction and overview of spatial biology technologies Talk I: User perspective
12:00-13:00	Lunch break
13:00-17:00	Planning and optimizing a spatial transcriptomics experiment (10xGenomics tools) Hands-on session: Tissue sectioning, tips and tricks of tissue preparation and quality control

Day 2 - Tuesday, 10 November 2026: Tissue Preparation, Staining, Imaging and Data Analysis

08:00-11:00	Review of Day 1 and discussion of open questions Hands-on session: Visium HD I: from Deparaffinization to Hybridization
11:00-12:00	Talk II: User perspective
12:00-13:00	Lunch break
13:00-14:00	Take-home messages on tissue preparation and handling.
14:00-17:00	Introduction to NGS workflows, omics data analysis, and the bioinformatics and computational considerations of spatial biology Talk III: Company talks

Day 3 - Wednesday, 11 November 2026: From Probe Capture to Sequencing: Visium HD Library Workflow

08:00-12:00	Hands-on session: Visium HD II: Ligation, CytAssist workflow, capture area assessment in Loupe Browser
12:00-13:15	Lunch break
13:15-18:00	Hands-on session: Visium HD III: From probe elution to post-library QC Talk IV: Company talk

Day 4 - Thursday, 12 November 2026: Spatial Transcriptomics Data Analysis and Visualization

09:00-12:00	Lecture and hands-on session: Data preprocessing using Space Ranger Quality control, normalization, clustering and cell population mapping using Loupe Browser
12:00-13:00	Lunch break
13:00-17:00	Lecture and hands-on session: Differential analysis, annotation, segmentation and visualization using Loupe Browser Limitations of no-code analysis Talk V: Expert perspective on advanced workflows for spatial analysis

Day 5 - Friday, 27 November 2026 (online session): Guided Analysis of Participant-Generated Spatial Transcriptomics Data

09:00-13:00	Guided analysis of data acquired by participants Discussion of results, wrap-up and Q&A

Module 2 - DKFZ Heidelberg | 1-5 February 2027
Spatial Multiomics, Data Workflows and Integration

Objective: introduce spatial multiomics concepts, hands-on spatial technologies, data types, image analysis, data management and integration workflows.

Day 1 - Monday, 1 February 2027: Foundations of Spatial Multiomics and Sample Preparation

09:00-12:30	Overview of spatial multiomics Project planning and experimental optimization
12:30-13:30	Lunch break
13:30-17:00	Hands-on sectioning and quality control

Day 2 - Tuesday, 2 February 2027: Hands-on Spatial Technologies

09:00-12:30	Hands-on introduction to selected spatial technologies Parallel group rotations running ISS, COMET and Xenium workflows part 1
12:30-13:30	Lunch break
13:30-18:00	Parallel group rotations running ISS, COMET and Xenium workflows part 2

Day 3 - Wednesday, 3 February 2027: Spatial Metabolomics, Data Types and Data Management

09:00-12:30	Spatial metabolomics Invited talks
12:30-13:30	Lunch break
13:30-17:00	Overview of spatial data types and data management concepts. Introduction to OMERO and spatialdata

Day 4 - Thursday, 4 February 2027: Image Analysis, Annotation and Visualization Workflows

09:00-12:30	Segmentation, image registration and quantification
12:30-13:30	Lunch break
13:30-17:00	Visualization and annotation workflows

Day 5 - Friday, 5 February 2027: Data Integration, Sharing and Community Discussion

09:00-12:30	Data integration Open mic session, data sharing and community discussion

Module 3 - MDC Berlin | 26-30 April 2027
Spatial omics across scales

Objective: connect imaging- and mass spectrometry-based spatial omics concepts with practical tissue preparation, microscopy, laser microdissection, proteomics sample preparation and multimodal data integration.

Day 1 - Monday, 26 April 2027: Workshop Overview, Tissue Preparation, Staining and IF Microscopy	
09:00-12:00	Workshop overview and theoretical introduction. Imaging- and mass spectrometry-based concepts, immunofluorescence imaging, widefield and confocal microscopy, staining workflows, smFISH and spatial transcriptomics
12:00-13:00	Lunch break
13:00-17:00	Hands-on work with prepared mouse liver FFPE tissue sections. Paraffin removal, antigen retrieval, antibody staining for immunofluorescence and microscopy using widefield and confocal systems

Day 2 - Tuesday, 27 April 2027: Computational Image Analysis and QuPath-to-LMD Workflows	
09:00-12:00	Overview of computational image analysis steps. Cell segmentation and introduction to open-source tools such as QuPath and napari
12:00-13:00	Lunch break
13:00-17:00	Analysis of acquired images, including nuclear and cytoplasmic segmentation QuPath-to-LMD function to export cells of interest for single-cell laser microdissection

Day 3 - Wednesday, 28 April 2027: Laser Microdissection-Based Tissue Sampling and Proteomics Sample Preparation	
09:00-12:00	Principles of laser microdissection. Single-cell proteomics and mass spectrometry
12:00-13:00	Lunch break
13:00-17:00	Hands-on automated laser microdissection. Collection of single cells into 384-well plates for proteomic profiling

Day 4 - Thursday, 29 April 2027: Sample Preparation for MS-Based Proteomics	
09:00-12:00	Sample preparation overview for single-cell proteomics and low-input tissue proteomics. Introduction to MS data analysis
12:00-13:00	Lunch break
13:00-17:00	Low-input tissue proteomics workflow using prepared 384-well plates. Short digestion protocol followed by peptide clean-up over Evotips and MS analysis

Day 5 - Friday, 30 April 2027: Multimodal Data Integration Tutorial: Overlaying Imaging Data with MS Results	
09:00-12:00	Wrap-up from the previous day and feedback on MS measurements. VoltRon concept, data types, overlaying imaging data with MS data and data visualization
12:00-13:00	Lunch break
13:00-17:00	Tutorial using imaging and MS data from the same tissue section. Summary, wrap-up and feedback session