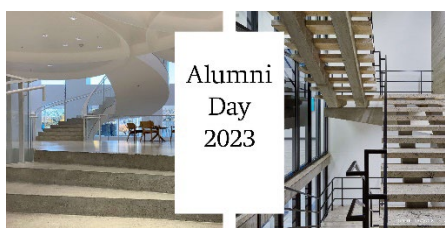
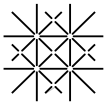


## Biozentrum World Alumni Day, June 23, 2023 Afternoon Program



Time	Guided tours (start in U1, Vita Parcours)	Biozentrum Spin-Off (U1.101)	Special Focus talks (U1.131)	Social (Science lounge 4 <sup>th</sup> floor)
<b>14:00 – 15:00</b>	All Biozentrum Tour			
14:00 – 14:30	Biophysics Core Facility	<b>NXI therapeutics – Dr. Rajesh Jayachandran</b>		
14:30 – 15:00	Imaging Core Facility		<i>“The NCCR AntiResist: New approaches to combat antibiotic- resistant bacteria” – Prof. Dirk Bumann</i>	
15:00 – 15:30	FACS Core Facility / Proteomics Core Facility			
15:30 – 16:00	Research IT	<b>AUKERA therapeutics – Dr. Dr. Dritan Liko</b>		
16:00 – 16:30	Research Instrumen- tation Facility / BSL3 Facility / Swiss High-Field NMR Facility		<i>“Exploring New Horizons in Structural Biology: Unleashing the Power of Deep Learning and Cryo- ET” – Dr. Joana Pereira and Dr. Ricardo Righetto</i>	
16:30 – 17:00	BioEM Lab	<b>SEAL Therapeutics – Dr. Judith Reinhard</b>		
<b>17:00 – 18:00</b>	All Biozentrum Tour			Pub Quiz with our PhD students
<b>18:00 – 22:00</b>	<b>Meet your former colleagues and friends at the Apéro and Dinner at the Biozentrum (U1)</b>			



## Core Facilities

The **Core Facilities** provide support to all researchers at the Biozentrum by offering access to state of the art equipment located at the facility. Members of the Core Facilities can help with the planning of experiments, give advice on the optimal usage of the machines and support data analysis. Each of the following facilities can be visited individually:

**Biophysics Core Facility:** The Biophysics Facility helps users to study the interactions, stability and size of biological macromolecules. To do this we have modern instruments for calorimetry, light-scattering, biosensor measurements, spectroscopy and analytical ultracentrifugation. We will give a short tour of the facility, briefly explain the techniques and give examples of their use in the Biozentrum and in the wider Basel scientific eco-system.

**Imaging Core Facility** Light microscopy is one of the major technologies used in life-sciences. The Imaging Core Facility uses highly developed light microscopes for live imaging, fixed samples, super resolution imaging, and diverse fluorescence microscopy techniques. Our services support research groups in their work with the latest microscopy techniques and software solutions, and range from initial advice in selecting the most suitable microscope for an experiment and setting it up to the final analysis of the imaging data.

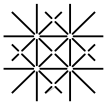
**FACS – Flow Cytometry And Cell Sorting Core Facility:** Flow Cytometry measures properties of cells/particles in a flowing stream in a very high throughput fashion. Fluorescently labelled cells pass one by one, in a single file through one or more lasers of different wavelengths. The emitted light is collected by an optical pathway of filters and later digitized via the detectors for analysis. Cell sorting allows the identification and isolation of specific populations of interest in a heterogeneous mixture of cells. Visit this facility and learn more about the many exciting applications of Flow Cytometry.

**Proteomics Core Facility:** In the Proteomics Core Facility we will introduce you to the field of Mass Spectrometry based Proteomics. We will show you how the field has developed in recent years and how it has become a cornerstone in modern life science research. The tour also includes a detailed look at the current state-of-the-art instrumentations present in our facility that we use to screen all proteins expressed in an organism or specifically to analyze target proteins/pathways and their modifications. We will also provide an outlook of what can be expected in the near future from our technology.

**Research IT Core Facility:** Large-volume datasets and complex IT Infrastructure setups have become an integral aspect of modern life sciences. We support, develop and operate services to address the specific needs of the Biozentrum community regarding research projects, data management and specific administrative requirements. During the facility visit, we will highlight some of these challenges and projects.

**Research Instrumentation Facility:** Staying at the forefront of science requires the ability to rapidly adopt or innovate and develop new devices and technologies. Offering digital fabrication capabilities is one of the ways the Research Instrumentation Facility (RIF) helps researchers turn their technology needs into customized solutions. Take this opportunity to tour the RIF's digital fabrication lab and learn more about how rapid prototyping can facilitate scientific exploration.

**BSL3 – Biosafety level 3 Facility:** Insights into the Biozentrum BSL3 Facility: Learn about the containment strategies of the biosafety level 3 laboratory and its use to study highly pathogenic agents. Our guests will



get insight and have the chance for discussion with our BSL3 facility head from the outside. (For safety reasons, no visits inside this facility are permitted).

[Swiss High-Field NMR Facility](#) The instruments at the Swiss High-field NMR Facility can be used to analyze large protein complexes, cellular nano-machines as well as targets of pharmacological interest and thus gain new insights into fundamental biological processes. The Swiss High-field NMR Facility is jointly operated by the Universities of Basel and Zurich and ETH Zurich and offers researchers from academia and industry cutting-edge NMR technology. Five high-performance NMR instruments with a field strength of 600 to 900 MHz are available at the Basel site. In Zurich, researchers will have access to the state-of-the-art 1.2 GHz NMR spectrometer starting from 2024.

[BioEM – Bio Electron Microscopy Lab](#) Electron microscopy is one of the most useful techniques to study the structure of biological molecules and cell architecture. At the BioEM lab we use cryo-electron microscopy to determine the three-dimensional structure of proteins and biological macromolecules to atomic resolution. To visualize the fine structure of cells and tissues we use cellular electron microscopy, such as transmission electron microscopy (TEM) imaging and electron tomography.

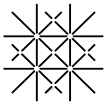
## Biozentrum Spin-offs

While some of the [Biozentrum spin-offs](#) have become independent and now reside outside of the Biozentrum, a few are still in house:

[NXI Therapeutics](#): develops small molecules that interfere with the so-called coronin-1 signaling pathway, which plays a role in the activation of immune cells, and selectively suppresses the immune response. In contrast to conventional, non-selective immunosuppression, the defense of the organism against infections or tumors is not affected.

[Aukera Therapeutics GmbH](#): possesses pioneering expertise to develop new therapies for patients suffering from mTOR-related disorders such as tuberous sclerosis, which causes tumor formation in various organ systems. Aukera's discovery engine enables the development of new classes of pharmaceutical drugs to selectively target different branches of the mTOR pathway.

[SEAL Therapeutics](#): develops its proprietary SEAL technology, an innovative gene therapy approach, as treatment for patients with laminin- $\alpha$ 2 deficient congenital muscular dystrophy (LAMA2 MD).



## Special Focus Talks

Our Biozentrum researchers regularly present their latest research to the interested general public in the [“Einblicke” lecture series](#). On Alumni day, we will focus on two important topics with broad relevance: current new approaches to tackle the antibiotic resistance crisis and the impact of deep learning and cryo-ET on structural biology research:

### Prof. Dirk Bumann:

*“The NCCR AntiResist: New approaches to combat antibiotic-resistant bacteria”*

The National Centers of Competence in Research (NCCR) comprise the Swiss National Science Foundation's innovative instrument to facilitate research across different institutions and disciplines. This collaboration promotes top quality research in strategically important research fields. The Biozentrum is proud to be the home institute for the NCCR AntiResist. AntiResist aims to tackle the rapid and global rise and spread of bacterial pathogens that are resistant to one or more antibiotics. Such multi-resistance is a problem of strategic and international importance. Prof. Dirk Bumann from the Biozentrum, Deputy Director of the NCCR, will give insights into the research approaches of this NCCR.

### Dr. Joana Pereira and Dr. Ricardo Righetto:

*“Exploring New Horizons in Structural Biology: Unleashing the Power of Deep Learning and Cryo-ET”*

- Dr. Joana Pereira  
*A Journey through the Protein Universe: Unveiling Hidden Biological Systems through Deep Learning-based Structure Prediction*
- Dr. Ricardo Righetto  
*Towards visual proteomics: looking at protein structures inside the cell using cryo-electron tomography*

In this two-part talk, Joana Pereira, a postdoctoral researcher in the Schwede group, and Ricardo Righetto, a senior scientist in the Engel group, will talk about recent advances in both protein structure prediction using AI and in electron microscopy techniques. These techniques are allowing us to discover new biological systems at unprecedented scales and explore their biological activity in their native context: the cell.