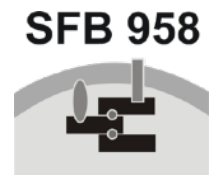


Text transcript to video:

Forschung funktioniert besser, wenn man Wissen und Geräte teilt! (Research works better when knowledge and equipment are shared!)



Dr. Katharina Achazi // BioSupraMol, Freie Universität Berlin

Dr. Jan Schmoranzer // Ambio, Charité

Research: development of high-resolution microscopy methods

New scientific investigation methods, but also the further development of already known methods, enable breakthroughs in research.

In light microscopy technical developments are also creating the conditions for obtaining ever more detailed insights at the cellular and molecular level. However, these state-of-the-art microscopes are very expensive and complex devices. So, in order to provide access to these devices to as many researchers as possible, research institutes need a good strategy.

How can this work?

Dr. Katharina Achazi:

My name is Katharina Achazi. I work here at Freie Universität Berlin at the BioSupraMol Equipment Center in Optical Microscopy.

In the past, each research group bought its own large-scale equipment. A single one of these can easily cost half a million Euros.

So that many researchers can have access to this equipment and so that this equipment is not all purchased more than once, the state supports inter-institutional equipment centers, so-called "core facilities". After all, most research funds come from the public purse.

The SupraFAB is a purpose-built research building that takes into account the special needs of optical microscopes and other large-scale equipment.

For example, for the study of bio-interfaces we need a very stable room temperature, this is also particularly important for the STED microscopes.

The scanning electron microscope requires a special 7 m deep pendulum foundation so that, for example, passing trucks do not disturb the images with their vibrations.

There are also laboratory areas with increased biological safety levels and a clean laboratory area in which nanostructures of surfaces can be produced and studied.

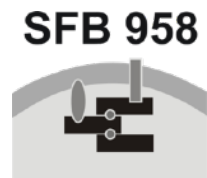
Core Facilities not only provide space and equipment infrastructure, they are also places for communication and interaction. At SupraFAB, we therefore have cozy seating areas, seminar areas with cooking facilities, and an outdoor area with a giant swing and seating.

This facilitates interdisciplinary work between biologists, chemists, and physicists.

In addition, SupraFAB is designed to be family-friendly; we have a playroom and quiet room for children so that researchers with children can also actively participate in everyday research.

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Research: development of high-resolution microscopy methods

Dr. Jan Schmoranzer:

Hello, and I am Jan Schmoranzer. I lead the "Advanced Medical BioImaging Core Facility at Charité Berlin" and am also a subproject leader in SFB 958.

At AMBIO, the "routine workflow" is usually something like this: After the researchers have registered with us with their research project, there is an initial obligatory project meeting. First you have to find out what exactly the biological question is. And then you step back and say, in order to achieve this goal, it's best to take this type of microscope and this measuring mode, prepare the sample in such and such a way, and combine it with this analysis software. We kind of put together a whole package, what we call the "imaging strategy."

And then the researchers are trained specifically for their project on the microscopes. We instruct them in the technical use of these devices, explain the pitfalls and problems that can arise, and then ensure that the researchers are able to master them.

After the training, the researchers can then work independently on the equipment 24/7, if they want to.

To do this, they book themselves an appointment via an online system, with or without assistance, as needed.

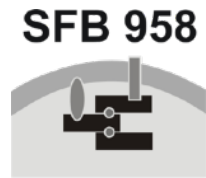
Although we are very well equipped here at Charité, we cannot cover off all microscopy methods. There are simply too many. If we cannot offer a method, we try to find a possibility within Berlin. Well, I'm mainly - let's say 80 percent of my time - occupied with service activities and logistics. That means troubleshooting and repairing the equipment. And optimizing new technologies and establishing them for routine use.

The rest of the time I use to develop special new methods for very specific research questions. By combining what is already known with new ideas, we manage to open new scientific doors here. Clearly, this kind of method development is an important part of research.

Our novel microscopes generate ever larger and more complex image data. Especially our 3D video data of moving structures in living cells are in the range of gigabytes to terabytes and are very complex to analyze. Data management and analysis are becoming increasingly complex.

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Research: development of high-resolution microscopy methods

This has now become a research field in its own right. Accordingly, in addition to a solid data infrastructure, we also need a fat server with high computing capacity, and also the expertise to process this complex data.

Fortunately, our team is very complementary in terms of expertise, so that we can solve the various tasks together.

And it is precisely this interdisciplinarity and creativity that makes working together in a Core Facility so interesting and exciting.

The important thing is: You have to have an appetite for technology and be open to new developments.

Project website: bcp.fu-berlin.de/nos

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