

Discussion starts with a few facilities giving their view on remote viewing and remote control

### **Remote viewing**

EMBL: everyone has remote VNC to support PC  
SerialEM has all integrated

Sweden  
VNC to gatan and pc computer  
Slow to setup a full data collection

Cambridge Pharma consortium:  
Lots of remote viewing and control with Teamviewer  
VNC is not a good remote viewer

Others (Leeds, eBIC) say VNC is fine.  
For TeamViewer you need a license to use as university (1,000 EUR per year)?

Ohio State do remote with hands panel etc, material science scopes

eBIC: 200 kv arm run from UK, and TeamViewer at night from US.

Teamviewer over rapid is okay. Teamviewer behind vpn setup

EMBL comments that serialEM allows offline loading and editing of maps to select squares (by a remote person for example) and also allows for grid rotation.

Teamviewer also allows view only mode

### **Risks associated to self-usage**

Consent form → EMBL, if they break it, you ban them. Name and shame approach. If everyone can see who booked the machine before it was broken, then they can see who is responsible.

eBIC: comes down to training users and make sure they only do what they are trained for. if remote or in the control room, what is the difference?

It can be that people work different hours during remote session with no staff present to assist if needed.

At eBIC, remote control is limited at normal working hours.

Allowing remote control should happen, it would allow users to perform different experiments during a session (SPA, Tomo etc)

EMBL: 9-17h should be enough and could be automated.

Give choice to the user.

With SerialEM, you can share JPEGs and that is sufficient to view the post processing  
Only internal users can view the data.

Expectation management is also important. Some new users might think if the session starts on Friday the operator will work during the week end or evenings.

At eBIC there is a formal system for after office hours. Someone is 'on-call'.

Esr: on-call until 22 at night.

Otherwise until next day.

If some part of the session is lost what do you do:

eBIC:

Loose half a shift (4h), not giving back

If more than that, refund in the BAG.

Also, eBIC keeps flexible days. 1 per week. For rescheduling. Until 1-week before.

Same at the Cambridge consortium.

Synchrotron is 2-3 weeks down every 12 -weeks. Use these days for rescheduling

230 days per machine per year at eBIC

### **Efficient use of machines**

EMBL:

For new students a good approach is to start with giving them a nice dataset to process.

Then they know what good images and good data is.

Then you teach them on a T12, then on freezing grids.

Backwards training.

Then when it's time to teach them how to load grids at the krios, they know not to waste time at the krios as they have seen the long process to get there and know what good data looks like.

Increases efficiency.

VIB asks how do people screen?

At VIB, they have short screening blocks of 90 to 180min

2-3 users per cassette

In Leeds, shared cassette as well. For screen blocks. 3 blocks in one day with the most promising samples and most experienced users at the last shift to try setting up a quick data collection.

ETH Zurich: they are getting a glacios for the screening, but at the moment, 2-days screening per week on the krios. 4slots, 2 loading, 2 people share 1 cassette. 1 gets 6, the other 5.

Experienced user, last slot starting at 9pm.

Usually setup overnight.

Gives a lot of progress. Will be done similarly on Glacios, 2 half days, 1<sup>st</sup> slot for screening and 2<sup>nd</sup> slot for overnight data collection on F3. Next day condition screening. Sample conditions communication between user and facility operator.

Screening slots during office hours.

Later at night, experienced user, without supervision

Of course, this only works for internal users.

Pharma consortium:

Screening on krios.

At the end of the day if things don't work, we do cryo-cycle.

5h for AL (IGp was not getting back on again), 2-3h for column

8h for AL to reach RT

Everyweek cryocycle

After 4-5h vaccum is fine

Embl:

Look at vaccum levels

Every 3 weeks. Why is there no clear message from TF about this.

Different facilities do different things!

Leeds:

Different stories doesn't help

Every 25h, 8h AL + column

eBIC, every 3-weeks, 8h AL+column

suggest, once reached RT, start cooling down automatically

### **Training:**

EMBL

Different desires between EM groups and xray groups.

From xray groups they just want structure

EM groups want to learn more.

Leeds:

Same thing is being seen.

EM as a tool or EM that want to be expert

As a university we need to train students. A minimum of fundamentals.

No need to train them as experts, but bare minimum needed.

eBIC:

Soon all will be automated and biologists don't need to learn

EMBL:

Watch the online theoretical videos before going to the microscope

Sweden:

Get a collaborator to do the EM

EMBL:

If someone not trainable, just get a collaborator.

## Screening:

EMBL: students follow the workflow. Neg stain didn't work so we tried cryo etc is often seen and a mistake.

Get users to do more biochemistry before moving to EM

Today with cryoEM, people have a protein and put it on a grid.

But this can be a PhD project.

In iNEXT, screening of samples is provided in 3-days slots. It is difficult to find the balance between helping people and collecting the best data. If you collect bad data (bad sample) to help people it can also be a reputational risk.

eBIC: neg stain works and it's quick.

If you want to do EM, you need a minimum of equipment: T12 + freezing device.

Offering screening as service – 1day is not enough. Cannot be offered.

Also, negative stain on a T12 is perfect for training.

Same approach at ETH.

VIB:

Neg stain to check every purification

10min slot to adjust during purification steps

With membrane proteins, check reconstitution conditions. It proved to be very valuable.

Brazil:

Different users from different background

How to get involved

Easier to get involved sometimes instead of training.