



EMBL Core Facilities and IT Services Review

The EMBL Core Facilities and IT Services were reviewed on 6 to 8 March 2018 by a panel of 17 international experts, including two members of the Scientific Advisory Committee (SAC). The review was chaired by Kai Johnsson, Max Planck Institute for Medical Research, Heidelberg (DE). The Chair of SAC Paul Nurse and the EMBL Director General Elect Edith Heard attended the review as observers.

Evaluation Summary

The mission of the EMBL Core Facilities and IT Services is to support research groups at EMBL and, where capacity permits, scientists at institutions from EMBL's member states. It was the opinion of the review panel that both the Core Facilities and the IT Services perform exceptionally well and have a fundamental impact on research at EMBL and on the European life sciences in general.

EMBL currently has eight Core Facilities, offering services in genomics, flow cytometry, advanced light microscopy, electron microscopy, chemical biology, protein expression and purification, proteomics and metabolomics. The panel rated the overall performance and the quality of the services offered by the facilities as outstanding. The Core Facilities and their leadership were congratulated on how they responded to major challenges over the last review period, including the turnover of three Core Facility Heads. Furthermore, a new facility – in metabolomics – was successfully established, addressing a major need within EMBL.

Along with the very high standards of service, the review panel commended the facilities' efforts in developing new methods and workflows to help fulfil user needs. The development and implementation of on-section correlative light-electron microscopy (CLEM) and correlative Focused Ion Beam SEM services by the Electron Microscopy Core Facility (EMCF) and of a complete multiplexed proteomics service workflow by the Proteomics Core Facility were highlighted as particular examples. The panel was impressed by the multidisciplinary approach of the unit's activities – based on the combination of complementary enabling technologies practiced in different facilities – for example in the areas of CLEM and single-cell technologies. The Core Facilities' training efforts – both in supporting individual users and in organising courses and workshops for the wider community – as well as their integration into the European landscape through participation in international initiatives and networks were valued as exceptional.

In total, the panel was very impressed with the overall competence, commitment and transparency of the Core Facilities staff, and greatly appreciated their efforts and unique enthusiasm in serving their user communities. In their thorough analysis of the unit's activities, the panel highlighted a need for additional expertise and user training, particularly for users of the advanced light microscopy (ALMF) and electron microscopy facilities, in image processing and analysis, and thus recommended to strengthen support in this area. Several other recommendations were provided – either general, applying to the entire unit, or related to specific facilities – aimed at further improving and/or expanding the excellent service provided.

A dedicated sub-panel focused on the review of EMBL's IT Services, which were found to function extremely well and were rated as outstanding. The panel noted significant improvement and highly effective investments over the review period that dramatically increased the IT service level and overall capacity. Moreover, they commended the IT Services' contribution to integrated activities in European life science research, such as the European Open Science Cloud and work carried out in the context of EIROforum.

The panel expressed some concerns regarding the sustainability and scalability of the IT infrastructure, particularly the 3D Cloud, in view of the planned expansion of EMBL's imaging facilities and recommended that the IT team be involved early in the planning phase so as to define and be able to respond to the new requirements. Other concerns related to securing the funding required for



adequate bandwidth for all EMBL sites, and to the involvement of the IT Services in setting up and operating the IT infrastructure, particularly at the sites in Grenoble and Hamburg. To maintain the high quality of service, the panel recommended to look into recovering additional funding from user fees, to intensify user training in the areas of IT security and data management and to potentially strengthen activities in the area of desktop support.

Finally, the panel provided some suggestions to EMBL for the organisation of the next Core Facilities and IT Services review, mainly aimed at providing the reviewers with additional information ahead of the review and at maximizing their opportunities to collect feedback from various stakeholder groups.

Response to the Review Panel's Recommendations

I would like to start by thanking the panel for their detailed analysis of EMBL's Core Facilities and IT Services and for the constructive recommendations and advice they provided. I am delighted with their extremely positive evaluation of the services under review and grateful for their suggestions as to how the materials presented for future reviews might be improved.

The reviewers attribute much of the success of these services to the efforts of Rainer Pepperkok and Rupert Lueck, and I share the opinion that both have performed in an outstanding way. Rainer Pepperkok has proven to be an exceptional Head of Core Facilities, with his commitment as Head of the ALMF not affecting, and possibly even reinforcing, his activity as Head of Core Facilities. Rupert Lueck has done an impressive job of scaling up the capacity and performance of the IT Services, particularly against the background of the recent data explosion deriving from the use of new research technologies. Furthermore, the panel also highlights the high level of commitment and enthusiasm of the Core Facility staff at all levels. This they identify as one of the key features of the overall success of the unit.

In reviewing the activities of the Core Facilities, the panel noted the need for additional user support in advanced image analysis. This issue has recently also been highlighted during the review of specific EMBL research units; it is one that we are aware of and have been addressing, though previous attempts to recruit in this specific area have not been successful. One of the expert ALMF staff members has recently left the facility to head the new EMBL Centre for Bioimage Analysis, which provides support and training to scientists across EMBL and collaborates closely with both the ALMF and EMCF. I will say more below about the various staffing and upgrading recommendations made by the panel.

The panel felt that the activities of the Chemical Biology Core Facility (CBCF) are greatly affected by the uncertainty concerning its relationship with one of EMBL's external partners. The CBCF is indeed different from other EMBL Core facilities in that it is a shared service, funded by one third each by EMBL, the German Cancer Research Centre (DKFZ) and the University of Heidelberg. The panel noted that its successful operation requires a sustainable funding model, which should in their opinion be based on a five-year commitment from EMBL and its partners. This would allow for long-term planning and recruitment/retention of high-quality staff. The complexity of decision-making in the University has led to delays and shortfalls each time our agreement has had to be renewed. I fully agree with the comments made. Lack of continuity is bad for any service or support activity and the CBCF is no exception. We have already engaged in discussions with our partner institutions around this topic and will continue to work with them until a suitable solution can be reached. We are also considering the possibility of adding an additional partner to help provide stability. I am however happy to report that the acute funding problem that was current at the time of the panel review has now been resolved.

Another concern highlighted by the reviewers regards the Metabolomics Core Facility. This they regard as having started very well, but they say that it now needs further development and additional staff to achieve its promised goals. Again, I will comment on the recommendations for expansion of activities below.



In relation to EMBL's IT Services, perhaps the major recommendation made by the reviewers regards the development and implementation of a clear policy on data management, ideally to be complemented by offering training in this area widely to EMBL staff. IT Services has, in discussion with EMBL groups and teams, been developing an application that helps to track the location of all stored data files on the storage servers. This protects against data loss when people leave EMBL, protects ownership, etc. The next step in this process is to connect this application in an appropriate way to enable easy data sharing and open access, as increasingly demanded by external funders. This is in progress and IT Services are participating actively in the developments.

The panel also recommended that IT Services be closely involved in the implementation of the EMBL General Data Protection Regulation (GDPR) policy, currently under development, to raise awareness on the IT-related issues relevant to personal data privacy and management. As I mentioned to the review panel, IT Services have indeed been deeply involved in EMBL's discussions and development of the Laboratory's internal policy on data protection.

As a general suggestion, the panel encouraged the adoption of additional and more standardised performance metrics – to facilitate comparison among EMBL's facilities/services and with other service providers – that would serve for internal policy and decision making as well as for future reviews. I will explore this topic with the senior staff involved and discuss how useful metrics could best be generated. Similarly, I will address and follow up with the units' leadership or in the appropriate EMBL-wide context on other recommendations provided by the panel that I do not discuss here in depth.

The panel made a significant number of recommendations concerning equipment upgrades and increased staffing. In total, the panel recommended the addition of 10-12 staff members to the combined Core Facilities and several more (depending to some extent on which other recommendations EMBL follows) in IT Services. In addition, they recommended very significant spending on the replacement, upgrade and addition of new equipment. These recommendations were justified by two requirements, to maintain the Core Facilities at state of the art and the need for EMBL to be able to store and manage ever-increasing quantities of data. Neither type of expenditure is in a category where external funding can be raised, meaning that any increases have to come from internal budgets. Although I am very sympathetic to these recommendations and agree these investments into critical support functions should be a high priority, I told the panel that in a period where the member state funding, across the Indicative Scheme, will decrease in real terms there is no possibility that I will be able to provide them. Inevitably, this will have an ongoing effect on the quality of the Core Facilities and IT Services as well as to any capacity they have to serve external users.

I would like to conclude by congratulating my colleagues in the Core Facilities and IT Services for the very successful outcome of this review and by thanking them for the crucial support they provide to EMBL's research and overall activities.

A handwritten signature in blue ink, appearing to read "Iain Mattaj", is written over a large, light blue circular scribble or watermark.

Professor Iain W. Mattaj, FRS, FMedSci
Director General

26 April 2018