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EMBL Core Facilities and Imaging Services Review Report
Summary and Response

The review of the EMBL Core Facilities, Imaging Services, and the Bioimage Analysis Support Team took place in Heidelberg from 24 to 26 February 2026. The review panel consisted of 26 international experts, including four members of EMBL's Scientific Advisory Committee (SAC), and was chaired by Elina Ikonen (University of Helsinki). The panel brought together a broad range of expertise across core facility operations, imaging, multi-omics technologies, and data science. In addition, several observers were present, including the then Interim Director General Ewan Birney (now Director of EMBL-EBI), Jan Korbel, Interim Head of EMBL Heidelberg, Jessica Vamathevan, Chief Strategy Officer, and Bianca Schmitt, Strategy Manager, as well as representatives from each services' internal user committee.

Evaluation Summary

The panel recognised the EMBL Core Facilities and Imaging Services as an outstanding and important component of the EMBL research environment, delivering services of very high quality and strong scientific impact. The panel highlighted the strong and effective leadership of the Core Facilities under Rainer Pepperkok, noting his open and supportive approach, his focus on user needs, and his role in shaping a coherent and collaborative core facility environment. The panel noted that the Imaging Centre is currently in a phase of transition and emphasised the importance of ensuring clear and coherent leadership structures to support its continued development. All facilities were commended for their alignment with user needs, their contribution to high-impact research, and their central role in enabling interdisciplinary science across EMBL and beyond. As part of this review, the Bioimage Analysis Support Team from EMBL's Data Science Centre was also evaluated. The panel recognised the team for providing high-level expertise in image analysis and user support, and for contributing to the development of scalable analysis pipelines and data practices aligned with increasing data and AI requirements.

The establishment of two new core facilities during this reporting period was seen as a major achievement and a significant strengthening of EMBL's service landscape. The Mobile Laboratory Core Facility expands EMBL's capacity to support research in the field, enabling the deployment of advanced technologies for large-scale sampling across Member States. The Microbial Automation and Culturomics Core Facility provides high-throughput infrastructure for the automated cultivation, genetic analysis and phenotyping of micro-organisms and was

recognised by the panel as a unique facility with outstanding potential to support and further develop EMBL's activities in microbiology and ecosystem research. In parallel, the Imaging Centre, which launched at the beginning of the reporting period, provides access to advanced light and electron microscopy technologies, in particular for external users, complementing existing capabilities and further enhancing EMBL's role as a European hub for cutting-edge imaging. Together, these developments were seen to create important opportunities for the coming years, both in terms of scientific scope and engagement with the wider Member State community.

Among the key scientific highlights of the review period, the panel further emphasised the successful establishment of cross-facility and cross-site workflows, including examples such as targeted volume imaging, which enable more integrated and interdisciplinary approaches across EMBL. The panel also recognised the strong record of achievements across the facilities, including publications, method, tool and instrument development, as well as active community engagement and partnerships with industry, as clear indicators of the quality and impact of the services provided. This positive assessment is reinforced by the detailed evaluation of the individual facilities and services, where the panel noted consistently positive user feedback across the portfolio. Users highlighted the high quality of support, the expertise and engagement of staff, and the central role of the facilities in enabling their research. The panel also recognised the close scientific collaboration of many facilities with research groups, reflected in co-authorship on publications and active involvement in experimental design, as well as their strong engagement with the wider scientific community through training, outreach and collaborations.

The panel emphasised the importance of serving the wider Member States and noted that most Core Facilities currently primarily serve an internal user community. It recommended developing clear targets for external provision, including equitable access across Member States, transparent access routes, and appropriate metrics to assess success in this area. At the same time, the panel noted that consolidation of Core Facilities or prioritisation of mission-critical services is a complex task given that the review took place during a leadership transition. It also highlighted that Core Facilities may need to respond flexibly to the needs of newly recruited Group Leaders, including through unplanned investments.

While recognising existing examples of strong collaboration, the panel recommended a more systematic and comprehensive approach to cross-facility and cross-site cooperation, including the strategic deployment of resources, particularly in the context of multi-omics approaches. Artificial intelligence was identified as a major strategic priority, with the panel highlighting the importance of further developing and prioritising AI-related activities across Core Facilities to enhance both operations and service development. In this context, the panel also noted heterogeneity in data management practices and recommended the development of a more streamlined strategy, including improved multi-omics data integration, increased use of EMBL-

EBI resources, and a stronger emphasis on data curation and metadata to support AI readiness of produced data.

Furthermore, the panel recommended that all Core Facilities clearly define and communicate their unique contributions to EMBL and the wider scientific community, in order to support future strategic prioritisation and resource allocation. With respect to imaging services, the panel identified a degree of overlap between the Advanced Light Microscopy Facility and the Imaging Centre Light Microscopy services and recommended considering a closer alignment of these activities to reduce redundancy and improve efficiency. The panel also commented on the importance of considering gender equality in future appointments for Heads of Core Facilities and services.

In addition, the panel highlighted several broader strategic considerations for the future development of the Core Facilities and Imaging Services. As the integration of artificial intelligence is expected to play a central role in EMBL's next research programme, the panel highlighted the significant opportunities in the development of AI-enabled, "lab-in-the-loop" services, where real-time data analysis can guide adaptive data acquisition and improve experimental efficiency. The panel also emphasised that the continued development of the Imaging Centre and its service portfolio should remain a priority, supported by investment in advanced instrumentation and highly specialised staff to further strengthen EMBL's engagement with the wider Member State community. Finally, the panel noted that succession planning requires careful consideration, particularly in light of the multiple roles currently held within the current Head of Core Facility leadership role, and suggested that these responsibilities may need to be progressively separated.

Lastly, across the individual facility evaluations, the panel repeatedly commented on the importance of maintaining sufficient staffing levels and expertise to ensure service continuity, the need for ongoing investment in infrastructure and equipment renewal, and the growing demand for integrated, cross-platform workflows.

Response to the Panel's Recommendations

I would like to thank the chair, Elina Ikonen and the whole panel for their time and effort in reviewing the EMBL Heidelberg Core Facilities and Imaging Services as well as the Bioimage Analysis Support Team. EMBL has a core mission to provide scientific services internally and to its member states and the EMBL Heidelberg Core Facilities and Imaging Services provided by the EMBL Imaging Centre are a key component of this.

I am pleased that the panel recognises the Core Facilities and Imaging Services as an outstanding and essential component in supporting cutting-edge research at EMBL and in its Member States and acknowledges their strong scientific impact. I also thank the panel for the extremely positive evaluation of the Bioimage Analysis Support Team as part of this review. I appreciate the panel's positive assessment of the leadership of the Core Facilities under Rainer Pepperkok and its recognition of the collaborative and user-focused environment that has been established. I agree with the panel on the importance of ensuring a clear and coherent leadership structure at the Imaging Centre to support its continued success and impact and we are in the process of finalising arrangements for its future leadership. I am pleased that the panel recognises the value of the newly established Core Facilities. The Mobile Laboratory Core Facility and the Microbial Automation and Culturomics Core Facility represent important developments for EMBL, and I welcome the panel's recognition of their scientific potential and their contribution to expanding EMBL's capabilities and engagement across Member States.

I thank the panel for highlighting the strong scientific output of the facilities, including publications, method and technology development, and engagement with the wider scientific community. The consistently positive user feedback highlighted by the panel is particularly encouraging and reflects the close interaction between facility staff and users, which remains a central strength of the EMBL Core Facilities model.

Shortly after this review, Tony Hyman took over as EMBL's Director General on 31st March. I agree with the panel that the future priorities of the Core Facilities and Imaging Services will have to be carefully reviewed against EMBL's future strategic direction following this change in leadership. While not necessarily focussing on consolidating services, we will also carefully explore further integration of services as appropriate. I appreciate the panel's constructive feedback regarding the service offerings provided by the Advanced Light Microscopy Facility and the Imaging Centre Light Microscopy services. We will carefully evaluate how to further strengthen synergies and ensure efficient use of resources while maintaining the strengths of both activities.

EMBL's Core Facilities come in different flavours when it comes to external access, with some being primarily focussed on internal support while others explicitly focus on serving external scientists from the Member States. However, as capacity allows, external scientists are able to access all of EMBL's Core Facilities. This engagement is important to EMBL as it represents direct value for our Member States. EMBL facility staff also readily support Member States through other modes of engagement, for example by advising and helping institutes set up, or troubleshoot, their own core facilities. EMBL will continue to explore how external access can be further strengthened while at the same time maintaining strong support for EMBL scientists. We will also explore how success in this area can be best captured through appropriate metrics. I

agree with the panel on the importance of transparent and streamlined access routes. The feedback we have received will inform future modifications in this regard.

The panel's recommendation to further strengthen cross-facility and cross-site collaboration is well taken and in line with our future plans for the Services. Currently, the Core Facilities collaborate and develop cross-facility technologies and methods in response to researchers' needs, for example in the fields of spatial- and multi-omics, and we will continue to develop integrative, cross-facility workflows to best support users.

Artificial intelligence will play an important role both in the future development of the Core Facilities and Services themselves as well as in enabling AI-driven research through the generation of high-quality, well-structured data. AI integration is already part of EMBL's strategic planning and will continue to be developed across the entire service provision. I agree that AI-enabled "lab-in-the-loop" approaches represent a major opportunity, allowing real-time data analysis to inform experimental design and data acquisition. More broadly, AI-based tools will increasingly support the automation of complex procedures and the iterative development of assays, and will be integrated into future Core Facility workflows accordingly. At the same time, Core Facilities and Services play an important role in ensuring AI readiness of the data they generate, including aspects such as data quality, centralisation, metadata and data curation. Along these lines, data integration across services will be crucial and is a key priority, closely aligned with ongoing multi-omics integration efforts at EMBL-EBI. The Data Science Centre will be playing a central role in setting and advancing data standards.

I thank the panel for the recommendation that Core Facilities clearly articulate their unique contributions. While facilities differ in their level of specialisation, ranging from services that meet common and routine experimental needs to highly specialised and bespoke capabilities, both are essential to support EMBL's research. This will be useful in further sharpening the profiles of individual facilities and in communicating their value and strengthening their visibility especially for external users. Furthermore, I are confident that the ability of Core Facilities to respond flexibly to the needs of newly recruited Group Leaders has been a longstanding strength and will continue to be an important aspect of our service model.

I acknowledge the panel's comments on gender equality. Promoting gender balance is an important element of EMBL's broader equality, diversity and inclusion strategy, and the organisation continues to make progress in this area. I also take note of the panel's observations regarding the importance of maintaining sufficient staffing levels, ensuring continuity of expertise, and continuing investment in infrastructure and equipment renewal. These aspects will be carefully considered to ensure that Core Facilities can operate effectively.

I would like to conclude by thanking the Chair and the panel for their diligent work and sage advice and also to congratulate all members of the EMBL Heidelberg Core Facilities, the EMBL Imaging Centre services, and the Bioimage Analysis Support Team for an extremely successful review. Their highly skilled and engaged staff, together with their collaborative way of working, enable EMBL to provide expert support to its research groups and to a wide range of diverse scientific projects across Europe.

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Director of EMBL-EBI

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