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EMBL Molecular Systems Biology Unit Review Report
Summary and Response

The review of the EMBL Molecular Systems Biology (MSB) Unit took place in Heidelberg from 4th to 6th of May 2026. The review panel consisted of five international external experts and nine members of EMBL's Scientific Advisory Committee and was chaired by Job Dekker (UMass Chan Medical School). In addition, several observers attended the review, including Council Vice Chair Savvas Savvides, EMBL Director General Tony Hyman, Jan Korbel, Interim Head of EMBL Heidelberg, Jessica Vamathevan, Chief Strategy Officer, and Bianca Schmitt, Strategy Manager.

Evaluation Summary

The review panel recognised the Molecular Systems Biology Unit as an outstanding and world-leading research environment. It acknowledged the strong foundations established under the leadership of Christoph Müller and Peer Bork in the former Structural and Computational Biology Unit and was particularly impressed by the leadership of the current joint Heads, Julia Mahamid and Nassos Typas. The panel commended the clarity of their scientific vision and their success in guiding the Unit's evolution into the Molecular Systems Biology Unit, rapidly establishing a coherent identity and developing a highly integrated and distinctive scientific programme.

The integration of structural biology, systems biology, microbiology, proteomics, metabolomics and structural cell biology was recognised as creating a unique research environment that is delivering on the Unit's vision of placing structural biology at the heart of systems biology. The exceptional quality and impact of the Unit's research was commended, particularly its leadership in studying molecules, molecular machines and cellular organisation across spatial and temporal scales. The panel further recognised the Unit's outstanding record of attracting competitive external funding, producing high-impact discoveries and training future scientific leaders.

The panel highlighted the Unit's exceptional strength in technology development and innovation. It recognised the Unit's ability not only to develop cutting-edge technologies but also to rapidly implement them in the Core Facilities for wider community benefit through the close integration of research and service activities within the Unit.

The panel praised the highly collaborative culture within the Unit and across EMBL as well as its success in attracting and developing outstanding junior Group Leaders. As examples of these strengths, it noted collaborative work from the Typas, Savitski and Zimmermann groups that uncovered emergent behaviours in gut microbiota communities following drug treatment and

revealed the dynamics and heterogeneity of protein glycosylation; the identification and characterisation of a previously unknown protein complex in Mycoplasma pneumoniae through collaboration between the Mahamid, Savitski, Typas, Bork and Zimmermann-Kogadeeva groups; and pioneering work from the Duss group tracking transcription-translation coupling in real time at the single-molecule level. The panel viewed these examples as demonstrating both the scientific excellence of the Unit and the strength of its collaborative and interdisciplinary research environment.

The Unit's outstanding training environment was also recognised by the Unit fellows, particularly for its strong mentoring culture, collaborative atmosphere, and different seminars. Fellows emphasised the benefits of the close integration between research groups and core facilities, the accessibility of colleagues and scientific expertise, and the strong support provided by the Heads of Unit. Postdoctoral fellows were particularly positive about interdisciplinary training and shared supervision between EMBL groups, particularly facilitated through the EIPOD programme.

Some concerns were raised regarding recent changes to the EIPOD scheme, which now focuses on collaborations between EMBL and external groups. The panel also noted that career-development support and preparation for postdoctoral career transitions may vary between groups and highlighted the importance of timely feedback on manuscripts and publications in supporting the career progression of early-career researchers. Some broader concerns were also raised regarding EMBL-wide administrative processes, including the responsiveness of HR-related support. For predoctoral fellows, the panel noted several areas where additional support could further enhance the trainee experience, including access to computational infrastructure and training, and additional guidance in navigating PhD registration, Thesis Advisory Committee and thesis defence requirements. The Graduate Office was viewed as highly supportive, although the panel noted that additional capacity and guidance could be beneficial in some situations, particularly when students are required to navigate complex administrative requirements or transitions following the departure of a supervisor.

To support the continued success of MSB, the panel encouraged the Unit to maintain the collaborative and integrated culture that has developed under the current leadership, including continued support for shared postdoctoral positions across groups and units, and to consider how scientific themes and physical co-location could continue to promote interaction and collaboration. The panel also recommended continued strategic investment in key research infrastructure, particularly cryo-electron microscopy and mass spectrometry, to ensure that the Unit remains at the forefront of this rapidly evolving field. In addition, it suggested that the future role of NMR spectroscopy should be reviewed and that the level of support required for this area be carefully evaluated.

The recent loss of computational biology expertise following several departures was identified as a significant challenge, and the panel strongly recommended recruitment in this area, particularly of researchers applying computational approaches to address fundamental

biological questions. It suggested that such appointments could align well with EMBL's broader activities in data science and artificial intelligence. The panel also encouraged continued consideration of optimal group sizes to support effective mentoring, retention of expertise and efficient use of resources, and recommended that efforts to improve gender balance continue through future recruitment processes.

Finally, the panel identified several areas relating to career development and the broader research environment. These included strengthening mentoring arrangements for junior Group and Team Leaders through the use of external mentors, increasing transparency around open-ended contract processes and career progression pathways, and reducing administrative burdens on scientists, particularly the Heads of Unit. The panel encouraged continued attention to these areas to ensure that MSB remains an exceptional place for scientific discovery and training.

Response to the Panel's Recommendations

I would like to thank the Chair, Job Dekker, and all members of the review panel for the time, effort, and expertise they devoted to reviewing EMBL's MSB Unit. I would also like to congratulate Julia Mahamid, Nassos Typas and all members of the MSB Unit on this extremely successful review, which reflects their scientific excellence, collaborative spirit and commitment to EMBL's mission. The panel recognised MSB as an outstanding and world-leading Unit, highlighting the successful evolution of the former Structural and Computational Biology Unit into a highly integrated and distinctive scientific programme that places structural biology at the heart of systems biology.

I agree with the panel that maintaining a highly collaborative culture will be essential to the Unit's future success. The Unit has benefited greatly from shared postdoctoral fellows, cross-disciplinary collaborations and strong interactions across EMBL. While the EIPOD scheme had to evolve in its latest iteration, EMBL continues to provide mechanisms that enable shared postdoctoral appointments and interdisciplinary collaboration. I also intend to look into bringing back aspects of the internal EIPOD program. We will also consider additional ways to strengthen collaboration and Unit cohesion as MSB continues to evolve, including through possible options for greater physical co-location of MSB groups.

I welcome the panel's recognition of the Unit's exceptional strength in technology development and the close integration between research and service activities. The ability to develop, apply and disseminate new technologies through the Electron Microscopy, Proteomics and Metabolomics facilities is a particular strength of the Unit and contributes significantly to EMBL's scientific mission. I agree that continued investment in scientific infrastructure and technological innovation will be essential to maintaining EMBL's leadership in these areas. We will also

carefully assess the future role of NMR spectroscopy in the Unit's scientific programme and the level of support required to maintain this capability where appropriate.

Recent turnover has created opportunities to further shape the future scientific direction of MSB, while also requiring careful consideration of how best to maintain critical expertise. I agree with the panel that computational biology is currently an area where additional expertise would be valuable for the Unit and EMBL more broadly. Future recruitment in this area should focus on computational scientists with a strong emphasis on addressing fundamental biological questions, rather than primarily on computational methods development. As artificial intelligence becomes increasingly embedded in computational biology, and as EMBL places a growing strategic focus on developing capabilities in this area, future appointments are likely to have strong links to AI and data science. EMBL is also building up a central AI entity, and we expect important synergies between this activity and the future development of computational biology within MSB. I further agree with the panel on the importance of maintaining appropriate group sizes. As the Unit continues to evolve, we will be actively looking into balancing group size, mentoring capacity, and Unit resources. EMBL remains committed to improving gender balance across its activities, including through future Group Leader recruitment, and this is being discussed in the wider context of recruitment, leadership and career development across EMBL.

I am particularly encouraged by the highly positive feedback received from predoctoral and postdoctoral fellows regarding the scientific environment, mentoring culture and collaborative atmosphere within the MSB Unit. I recognise the feedback from trainees regarding computational infrastructure. EMBL as a whole is currently developing a strategy for computational infrastructure to support our wider AI ambitions. We are also aware of the different administrative processes PhD students have to navigate, and EMBL's Graduate Office will continue to provide support and guidance where possible. I fully agree on the importance of timely feedback on manuscripts, particularly for predoctoral and postdoctoral fellows whose career progression depends on publication within time-limited appointments. Together with the Unit leadership, we will consider how best to ensure that trainees are appropriately supported in this regard.

The panel underlined the importance of strengthening mentoring for faculty, in particular for young group leaders but also for those approaching their nine-year term at EMBL, to support their transition to new positions outside the organisation. I wholeheartedly agree, and EMBL strongly encourages external mentoring of faculty through a mentoring programme, which is usually actively endorsed and promoted by Heads of Units. I agree with the panel on the importance of clear communication around EMBL's processes relating to open-ended contracts. All staff are made aware of EMBL's nine-year employment model, including the policies and guidelines that apply to appointments beyond this period. We will ensure that communication of the relevant policies and guidance remains clear and accessible.

I appreciate the panel's observations regarding administrative support and the importance of protecting time for science. EMBL will continue to look for opportunities to improve processes

and support structures where appropriate to ensure that MSB remains at the forefront of scientific discovery. We also recognise the concerns raised regarding HR-related processes. EMBL is currently in a major ERP transition phase, including the implementation of Workday, which represents a significant effort for our HR and administrative staff. We are aware that this transition has led to some initial delays and frustration while new processes are embedded and implementation-related issues are addressed. We will continue to monitor these processes and work to improve their efficiency and reliability as the transition progresses.

I would once again like to thank the Chair and members of the review panel for their thoughtful assessment and congratulate all members of the MSB Unit on an outstanding review.

Prof. Anthony Hyman, FRS
EMBL Director General

19 June 2026