
EMBL Rome Unit Review

The EMBL Rome Unit was reviewed on 19 to 21 October 2020 by a panel of 14 international experts, including five members of the Scientific Advisory Committee (SAC). The review was chaired by James Briscoe, The Crick Institute, London (UK). The Chair of SAC Paul Nurse, the Chair of Council Eiríkur Steingrímsson, the EMBL Director General Edith Heard, the Deputy Director General Ewan Birney, EMBL Council Secretariat Michael Thompson, and Strategy Officer Emma Steer attended the review as observers. Due to the SARS-CoV-2 pandemic and the resulting travel and physical distancing restrictions, the review was convened exceptionally via video conference.

Evaluation Summary

The EMBL Rome Epigenetics & Neurobiology Unit is headed by Interim Head of Unit Cornelius Gross, following Philip Avner's retirement in early 2020. The unit presently comprises five groups with one further group leader joining the unit in 2021. Another affiliated group leader is based at the Cell Biology and Biophysics Unit in EMBL Heidelberg. The current research strategy, defined by Philip Avner in 2012, focuses on epigenetics and neurobiology with an ambition to bridge these two fields. The use of mouse genetics and genome engineering in the pursuit of these themes provides a technological focus and the opportunity for the unit to develop as a centre of excellence within Europe.

The quantity and quality of scientific output has remained strong, with notable contributions in both neurobiology and epigenetics. Scientists in the unit have been recognised by the award of competitive international grants although more applications should be encouraged. The cooperative and interactive environment at EMBL Rome was noted by the panel, and provides a supportive atmosphere for training and mentoring.

For much of the review period, Philip Avner was the head of the EMBL Rome Unit and under his direction the unit refocused its scientific strategy smoothly and efficiently. His dedication and skills enabled the current success of the unit and the collaborative and harmonious working atmosphere. Cornelius Gross has provided impressive stewardship in taking over interim leadership at a critical time. He commands the respect and trust of the other group leaders on the site and is clearly an asset to the unit and to EMBL more broadly. He has developed an impressive scientific vision for EMBL Rome that builds on the unit's scientific strengths and fits with the next EMBL Programme.

Among the scientific achievements of this review period, the panel highlights Cornelius Gross' important discovery of specific sets of territory cells in the mammalian hypothalamus and their contribution to integrating spatial and sensory cues to drive social behaviours. Paul Heppenstall, who recently left the unit, developed a therapeutic strategy based on ligand-targeted ablation of pain neurons for mechanical allodynia - a painful sensation caused by innocuous stimuli like light touch. Research conducted by Matthieu Boulard, identified sugar modifications as mediators of gene repression resulting from the epigenetic mark of DNA methylation. The panel also highlights Jamie Hackett's work who developed a ratiometric reporter of DNA methylation that led to the identification of Dppa2 and Dppa4 as key factors safeguarding against de novo DNA methylation and epigenetic silencing at lineage-associated genes.

The panel notes the impressive involvement of EMBL Rome members in the development of the next EMBL Programme. The science of the unit is well suited to the proposed transversal themes of the future "Molecules to Ecosystems" Programme. For example, the unexpected gut-germline intergenerational interactions discovered by the Hackett lab provides exciting links with other EMBL sites on the microbial ecosystems theme. Additionally, EMBL Rome's proposal to develop its service capacity as part of the next EMBL Programme was encouraged by the panel. These services will include the new development and expansion of viral in vivo gene editing tools, thereby making these new tools available to the wider community. The ambitious idea of an innovative collaboration with EMBL

Hamburg for sequential tissue ultrastructure and spatial transcriptomics was also considered as innovative and exciting.

The panel agrees that the interface between neurobiology and epigenetics is a distinctive and promising area but recognises that these two fields are difficult to bridge or merge into one focus. Several options for strengthening or focussing the unit's scientific themes were discussed by the panel. Generally, it was felt that the best research themes will arise "bottom up".

The panel noted that EMBL Rome continues to suffer from a lack of critical mass, with only four to six groups on site at any time. Increasing the number of groups at EMBL Rome will benefit the scientific environment, financial efficiency, and international visibility of the unit. To achieve this, appropriate resources will be required. The panel also recommends that developing closer interactions with other institutes in Rome has the potential to increase the critical mass of EMBL Rome. Furthermore, closer interactions in a neuroscience and epigenetics network across EMBL and EMBL Partnerships can be beneficial.

The upcoming building refurbishment will address the severe structural deficiencies in the current building, the weak critical mass, and support the development of the unit's interdisciplinary focus and integration into EMBL's new themes. Nevertheless, group leaders were worried about the disruption that the construction will bring and the impact this may have on their research programmes. Similar worries were raised by the predoctoral fellows, who also mentioned the need for on-site family and medical support, advocated for more extensive safety training, and highlighted the pay gap between EMBL's German sites and EMBL Rome.

The panel recognises the progress made since the last review to improve mentorship and gender balance among group leaders at EMBL Rome. However, both will need to be further strengthened.

Overall, the panel finds the unit to be scientifically innovative and impactful, with a supportive atmosphere.

Response to the Panel's Recommendations

I would like to extend my thanks to the panel for their time and effort in reviewing the EMBL Rome Unit, particularly given the need to undertake the review in a virtual format. I was extremely pleased to hear all the positive and constructive discussions during the evaluation of the unit. I would like to extend my sincere congratulations to Philip Avner for his exceptional leadership and for successfully directing the unit through a refocusing of its scientific strategy. I would also like to congratulate and express my gratitude to Cornelius Gross for stepping up to guide EMBL Rome through a very critical time as Interim Head of Site. Both are trusted leaders who have helped to create a collaborative and harmonious working atmosphere, with exceptional scientific outputs.

The recognition by the panel of EMBL Rome's seamless integration into the next EMBL Programme is greatly appreciated. As was discussed during the unit review, EMBL Rome was very much implicated in the elaboration of this new programme. Indeed, some of the research highlights emphasised by the panel draw on areas of the next EMBL Programme as well as being deeply rooted in molecular mechanistic questions, which is the essence of EMBL.

Alongside the panel, I also fully support the vision of EMBL Rome to enhance their external service capacity. These future services will prove to be vital for member state researchers who will gain access to use them.

In response to the panel's comments concerning the future focus of the unit, this will strongly depend on the interests and visions of the future head of site. As the recruitment of this position is contingent on securing a new Host Site Agreement, EMBL is doing everything within the limits of the Italian parliamentary system to secure this new agreement as swiftly as possible.

I do agree with the panel's comments about the lack of critical mass within the unit and I fully concur with the panel's suggestion to draw on EMBL Partnerships in an effort to better embed the scientists at EMBL Rome in the local

community. EMBL is exploring new alliances and partnerships with institutes in the region to strengthen and cross-pollinate each other's scientific ideas. It is hoped that the resources available to each entity and shared within the partnership will enable mutually beneficial and productive scientific relationships. Securing the necessary and appropriate funds as part of the next Indicative Scheme will be vital in benefitting the scientific environment, financial efficiency, and international visibility of this unit.

The upcoming refurbishment of the unit will also address the lack of critical mass, by providing an attractive and revitalised physical infrastructure. The much needed refurbishment of the space will begin in 2022 and will be managed by a newly recruited project officer, dedicated to this operation.

The concerns raised about the impact that the refurbishment may have on scientific activities is taken on board. EMBL management recognises the worries that the group leaders and other staff members within the unit may have concerning the construction, especially given the additional challenges that they are facing due to the ongoing pandemic. We will try to reassure staff about mitigation measures to minimise disruption and ensure that scientific activity can continue. Working closely with the Interim Head of Site, the new COO and myself will continue to engage in a clear and open dialogue with all staff at the site to allay fears and provide reassurance throughout the entire refurbishment process.

In response to points raised by the predoctoral fellows: unfortunately a kindergarten is not viable at EMBL Rome, given the small size of the unit, although alternative solutions are actively being investigated; the unit does in fact have a work doctor who performs regular medical visits; concerns expressed about safety training and awareness will be followed up; and on the topic of cross-site salary comparisons, the basic salary scales and allowances for personnel based at EMBL Rome are calculated according to the procedure of the Coordinated Organisations, as outlined in EMBL's Staff Rules and Regulations.

In response to the panel's comment on improving mentorship within the unit, I will be actively encouraging group leaders to take advantage of the expertise within other EMBL units. This will complement the already excellent mentoring ongoing within the EMBL Rome unit, by taking advantage of scientists from several relevant areas across EMBL.

I strongly agree with the panel's comments regarding the need to continue addressing the issue of gender balance within the unit. This topic is one that all EMBL needs to address and EMBL Rome has made significant efforts in this direction. I am confident that these efforts will continue and will be helped by new EMBL-wide recruitment guidelines which will be implemented soon. The recent recruitment of Ana Boskovic at EMBL Rome, who will begin in 2021, is very welcome news as she is both an excellent scientist and a very good fit for the unit.

In conclusion, I would like to congratulate Philip Avner and Cornelius Gross for their exceptional leadership, as well as the entire EMBL Rome Unit for a very successful review. Not only does the review highlight the scientific excellence of this unit, but also its collegial and harmonious spirit that bodes well for even greater successes in the future.



Professor Edith Heard, FRS
Director General

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