**template for Peer Review comments**

**Technical series on synthetic biology**

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| **Contact information** |
| **Surname:** | von Bredow |
|  |  |
| **Given Name:** | Lucia |
|  |  |
| **Government** | N/A |
| **(if applicable):** |  |
|  |  |
| **Organization:** | European Molecular Biology Laboratory (EMBL) |
|  |  |
| **E-mail:** | lucia.von.bredow@embl.de (Bioethics Manager) |
|  |  |
| **Comments on the Technical Series on Synthetic Biology** |
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| 0 | 0 | **A: EMBL's Expertise**The [European Molecular Biology Laboratory](https://www.embl.org/) (EMBL) welcomes the opportunity to comment on this updated draft report on the CBD Technical Series on Synthetic Biology 82 (hereinafter "the Report".)  The EMBL is a molecular biology research institution supported by 27 member states, two prospect states, and one associate member state. It is Europe's only Intergovernmental Organisation for life science research. Innovative and interdisciplinary research at EMBL is conducted by more than 80 independent groups covering the spectrum of molecular biology.  EMBL’s overarching goal is to understand the molecular basis of life, and research at EMBL emphasises experimental and computational analyses of biological organisation, from molecules to organisms. Research areas cover a wide spectrum of biology, including structural biology, genome biology, cell biology, developmental biology, tissue and organ biology, neurobiology, microbiology, biodiversity, bioinformatics and computational biology, synthetic biology and molecular medicine. Adding to this, EMBL’s vision is to advance our understanding of ecosystems at the molecular level, applying expertise in molecular biology to study life in its natural context. In doing so, EMBL aims to use fundamental science to tackle societal challenges, including active consideration of bioethical and societal aspects of research pertaining to molecular biology in Europe.We believe that EMBL is, therefore, well placed to comment on the potential benefits and complexities of synthetic biology, as well as to respond to the conclusions and concerns raised in the Report.**B: Comments on the Report**Although we recognise that the Report outlines both positive and negative perspectives on synthetic biology, we are of the opinion that the general tone and scope could end up setting a dangerous precedent of restrictive legislation across the board, which would ultimately impede scientific research and development of societal importance. The following summary outlines our concerns in more detail.1. It is our view that although the majority of synthetic biology applications currently stem from engineering microbes (something that took place long before synthetic biology was even invented, and is quite well regulated – both points acknowledged in the Report), the Report instead mainly focuses on the danger / risks regarding gene drives and / or animals only. While we acknowledge the need for discussion on topics such as Gene Drive, this is at odds with the Report's proposal that there is a need for a unified framework that regulates *all* elements of synthetic biology.
2. The Report argues for "a process and expected outcomes that better align with the needs and values of society more broadly than human health and the environment", such as "societal and ethical issues'' and including economic factors. Again, it is concerning that this is the argument given for the need for new mechanisms across the board, despite the fact that all obvious 'risks' cited  concern mostly human and environmental health.
3. We believe there is an important nuance that has been omitted re microbes in the Report. For microbes, exchange of genetic material across species is rampant and happens naturally (in much more imaginative ways than genetic engineering and synthetic biology have proposed). Hence, one of the most efficient ways to obtain  microbes with specific traits is to undertake experimental evolution rather than genetic engineering/synthetic biology, and this would only increase with the use of microbial communities. We propose that this perspective is taken into account in the report for completeness.

**C: Recommendations**We oppose the recommendation for implementing umbrella frameworks,  unless and until leading molecular biology institutes (such as EMBL) have been both involved in and informed of their creation.We believe that issues of bioethics and biosafety are important concerns in which scientists must engage, to help build monitoring frameworks or processes which are transparent and easily measured. Experimental approaches, and material/data reuse cannot always be proscribed: regulations must remain flexible in this area. Exchange of materials between labs (samples, organisms, genetic material) and data derived from those materials is essential to science, interactions and sharing must be smooth and friction must be low. We advocate the principles of Open Science - accessible to all and of benefit to all - and believe that access and Benefit Sharing systems are crucial, and must in turn be harnessed to support Open Science. The current pandemic has illustrated the need for rapid, open scientific exchange of data, knowledge and expertise. We fear that the report will lead to measures that will slow down or even paralyse certain areas of critical scientific practice and research. The value of some synthetic biology approaches as tools to explore and understand biological systems, from the molecular scale to whole ecosystems must be underlined. Access to synthetic biology in combination with traditional approaches will better and more rapidly allow the scientific community to describe living systems and to understand the complexities of biodiversity, including its origins and vulnerabilities, how best it might be sustained and conserved and how its value might be brought responsibly and sustainably to society. It is, therefore, an important driver of the science upon which the Convention on Biological Diversity must build its actions.We, therefore, strongly recommend that there should be further consultation with molecular biology institutes like EMBL (and others, such as the [European Synthetic Biology Society](https://www.eusynbios.org/)) before the draft proceeds to a final report. We believe that this would help remedy the identified inconsistencies, and allow for a more nuanced perspective on the issue. We would be happy to provide further input as required. |

Please submit your comments to secretariat@cbd.int