**template for Peer Review comments**

 **Technical series on synthetic biology**

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| **Comments on the Technical Series on Synthetic Biology** |
| **Page #** | **Line #** | **Comment** |
| 0 | 0 | We note that there is a great deal of discussion in the document devoted to issues that we would not consider “technical”, such as dual-use applications and ethical and moral issues.  It would be our preference that a technical document such as this one avoid discussion on issues of a more political nature. This is exemplified by the fact of numerous decisions under the Convention regarding these matters generally are qualified by the phrase “according to national circumstances”, or similar language.  |
|  |  | We note that the authors stated that the examination of Synthetic Biology was taken to encompass a very wide range of technologies and applications. They additionally stated that not all readers would have the view that many of the technologies and applications are in fact synthetic biology. Given these caveats, we think that calling synthetic biology a “discipline” is something of an overreach.  |
|  |  | Additionally, given the “broad brush” approach taken by the authors as to what actually constitutes synthetic biology, many (if not most) of the applications discussed appear to be for the simple development of LMOs, which do not require any special treatment under the Convention beyond the procedures already established under the Cartagena Protocol for Biosafety. Similarly, CAR T-cells, cultured meat, genetic rescue and de‑extinction research and applications do not constitute synthetic biology. We are concerned that examination of such research will lead to duplication of effort regarding technologies and research that can be adequately covered under either the Cartagena Protocol, or other international agreements on (potentially) hazardous substances. Such resources would be put to better use in efforts to actually conserve biological diversity. |
|  |  | Furthermore, many of the applications discussed involve the synthesis of biological molecules, eg, DNA and RNA. We think that the simple synthesis of biological molecules (and their downstream applications thereof, such as cell-free systems) is not synthetic biology. In fact, the discussion on many of the applications under discussion tend to echo the assessment of LMOs, in that the product of a “modern biotechnology” process (eg, vanillin) is somehow viewed to be different to vanillin produced via organic chemistry processes, or purification from natural sources, despite no differences in the actual molecules so produced or derived. Therefore, chemical products that result from any application of synthetic biology (eg, vanillin, RNA, DNA, etc.) are in fact not covered under the CBD, and there are existing international treaties that cover any potential adverse effects that they may have on the environment as substances. This document should therefore restrict itself to organisms so as to avoid duplicative processes among multiple international agreements. |
|  |  | The discussion of developers of “synthetic biology” to publish and discuss concepts and applications prior to the initiation of any work is problematic, because it does not take into account the scientific method or process. Concepts are very rarely realised in full because research and experimentation reveal limitations of the concept, or improvements relative to the initial concepts. Concerns regarding dual-use applications being used as a reason to limit lines of scientific enquiry does not take into account that only those willing to act in good faith would be bound by such restrictions. Openness regarding such research also allows concomitant lines of research on the prevention or mitigation of the effects of dual use applications of a technology, leading to better outcomes than suppression of independent lines of thought. Risk assessment and risk management methodologies would apply to the containment of such organisms and/or substances. |
|  |  | Finally, despite the clear discussion of the potential environmental benefits in the main text of the document, the Executive Summary and Key Points appear to be rather skewed toward the discussion of risks and potential negative outcomes from synthetic biology. We do not think that this is reflective of the potential applications of Synthetic Biology and their concomitant benefits, and it would be helpful to see these sections of the document more accurately reflect the discussion in the main body of the text. |
| 9 | 40 | “of” should be “off” |
| 10 | 43 | “organism” should be “organisms” |
| 10 | 45 | Full stop (period) at end of line needed |
| 11 | 20 | “tropical”, not “topical” |
| 12 | 23 | The entire line is a fragment, out of place with the rest of the paragraph |
| 12 | 31 | “humanities” should be “humanity’s” |
| 12 | 41 | “cope-up” should be “keep up” |
| 17 | 45 | “synthetised” should be “synthesised” |
| 21 | 7 | “titter” should be “titre” |
| 33 | 31 | “*Arabisopsis”* should be “*Arabidopsis”* |
| 36 | 5 | “tomelting” should be “to melting” |

Please submit your comments to secretariat@cbd.int.