Statement from representatives of expert committees of the German Research Foundation (DFG)
Re: CBD Notification 2021-031

Draft Update of the „CBD Technical Series No. 82“ on Synthetic Biology

14.06.2021

The fundamental problem with the document is the lack of a clear definition of synthetic biology (and other biological terms) and the incomprehensible mixing of different subjects and methods that do not really have anything to do with each other (from genome editing to classical genetic engineering to gene drives, all under the umbrella term of synthetic biology); see for example [1].
Considering a genome-edited soybean, for example, that only carries a simple knockout mutation (permanent alteration of the genetic material through specifically making one or more genes inoperative), a product of synthetic biology is bold. The displacement of "natural" products by synthetic products has nothing to do with synthetic biology but is (if anything) a problem that is independent of the manufacturing process. For example, if vanillin is no longer produced from vanilla but chemically from wood, as is already predominantly the case, there are the same "problems" as if one were to use synthetic biology methods for vanillin production (e.g., key message 8 in the Executive Summary). In this respect, the document is fatally reminiscent of the demagogic argumentation on green genetic engineering, where there are still regular attempts to present general problems of agricultural production (monocultures, variety monopolies, etc.) as problems specific to genetic engineering.
At the same time, it is hardly possible to assess how even small trait shifts in species communities in the field (natural or not) initiate community-assembly processes that potentially lead to species shift or biodiversity reduction. It is difficult to predict if and when genome editing will create a "super species". Such possible consequences of genome editing and classical mutation or mutagenesis breeding, but also of synthetic biology, should be taken seriously, and a roadmap for how to investigate ecological risks should be developed. Although there are cultivated species that disperse into semi-natural habitats and lead to the displacement of biotic communities, this has not been sufficiently described in the literature so far or only for invasive alien species and too little in the agricultural context.
Overall, therefore, a detailed specification of the different subjects mentioned at the beginning would be desirable, as well as a clear delineation of methods and modified organisms with specific risk assessment in each case. If the legislation continues to stick to method-related regulations and does not take the risk assessment of the intended modified organisms or biological entities as a decision criterion for specific applications, no progress can be made in the matter. As with the release of genetically modified organisms, a step-by-step approach – where possible – is certainly sensible. Otherwise, precise impact assessments must be carried out in the event of non-retrievability from nature. In the case of gene drive this is certainly relevant, but in the case of small point mutations, which could also occur spontaneously, rather not.
All this ultimately leads to a document that is incoherent in itself and that, in its current form, can only accompany a critical discourse on synthetic biology but hardly serve as a basis for decision-making. In fact, the current situation of decision-making processes concerning synthetic biology and genome editing is very dynamic. In order to promote research and innovation, the CBD should revise the document to achieve a comprehensive text, including robust subject definitions and with an appropriate timeframe.

[1] https://epsoweb.org/wp-content/uploads/2018/11/17_08_30_EPSO_Synthetic-Biology_updated-Statement.pdf