Statement

European Plant Science Organisation
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Synthetic Biology is much more than the application of new breeding techniques

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The European Plant Science Organisation welcomes the debate about the definition, regulation and benefits of Synthetic Biology under the governance of the Convention on Biological Diversity (CBD). To support the upcoming discussion which will be held at the Conference of Parties (COP) Meeting in Mexico (6 - 14.12.2016), EPSO here provides a short statement presenting its view on Synthetic Biology from the Plant Science Community.

As there is still no clear definition of the term Synthetic Biology, the COP will focus on the two operational definitions which have been prepared for the CBD. The first is used in the opinion of the three non-food Scientific Committees (SCHER/SCENIHR and SCCS) submitted to the European Commission in 2014 and the second is used by the Ad Hoc Technical Expert Group (AHTEG) provided to the Convention on Biological Diversity (CBD) in 2016.

1. "Synthetic Biology is the application of science, technology and engineering to facilitate and accelerate the design, manufacture and/or modification of genetic materials in living organisms."

2. "Synthetic biology is a further development and new dimension of modern biotechnology that combines science, technology and engineering to facilitate and accelerate the understanding, design, redesign, manufacture and/or modification of genetic materials, living organisms and biological systems."

In addition to the first definition, a number of criteria (including techniques, organisms and materials) are listed by the Scientific Committees which as a prerequisite might be involved in Synthetic Biology. As helpful as such criteria are for the identification and discussion of potential Synthetic Biology cases, EPSO wants to raise its concern and state clearly that **from a scientific point of view the application of a certain technique or material does not lead automatically to a Synthetic Biology organism or product.**

The intention behind Synthetic Biology is to combine a number of modern techniques from biotechnology, computer science and other areas to engineer new synthetic organisms or products resulting from such an organism. Such techniques as well as other new biotechniques or nanotechnology do not cause an organism or product to be of synthetic origin just by their application. **In addition, a synthetic organism should be different from any organism found in nature**. When compared to modern biotechnology (e.g. genetic engineering) the epistemic novelty of Synthetic Biology lies

in the systematic use of engineering approaches to intentionally design artificial organisms (Raimbault et al., 2016; PLoS One).

According to EPSO's view, the sort of broad operational definition of Synthetic Biology provided by the SCs and AHTEG does not apply to the general use of individual modern biotechnologies such as sequence-specific nucleases, oligo-directed mutagenesis, or other new breeding techniques. **The use of any of these techniques as such does not imply the generation of a Synthetic Biology organism or product.** What counts as synthetic organisms and products for regulatory purposes should be evaluated on a case-by-case basis. Declaring all products of a particular technique to be a Synthetic Biology case will result in an untenable regulatory burden for already-established uses of older and newer biotechnologies, from traditional breeding techniques to computer science and new breeding technologies, which can already be regulated under existing frameworks.

Synthetic biology was discussed at the EPSO General Meeting in June 2016 and the respective statement at the EPSO Board Meeting in November 2016. The statement was finalised by the EPSO Working Group on Agricultural Technologies and the EPSO Board.

Contacts

Frank Hartung Julius Kühn-Institute (JKI), DE T: +493946-47550 frank.hartung@julius-kuehn.de	Meredith Schuman Max Planck Institute for Chemical Ecology, DE T: +49 3641 571116 mschuman@ice.mpg.de	Anneli Ritala VTT Technical Research Centre of FI T: +358400838631 Anneli.Ritala@vtt.fi	EPSO Office T: +32-22136260 epso@epsomail.org

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