# INVOLVING THE SCIENTIFIC COMMUNITY IN THE RISK ASSESSMENT OF GMOs. A CONTINUOUS TASK FOR THE BIOSAFETY AND BIOTECHNOLOGY UNIT

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The risk assessment of genetically modified organisms (GMOs) is a defined methodology aimed at determining and quantifying risks associated with their use. It relies on gathering and interpreting scientific and technical data in a scientifically sound and transparent manner, and is primarily based on the results of research and studies aiming at evaluating the potential impacts of GMOs on the environment and/or human health.

In Belgium, a single scientific advisory system common to the Federal and Regional authorities has been put in place to address all biosafety aspects related to the use of GMOs in a coordinated way. This common scientific evaluation system is composed of the Biosafety Advisory Council (BAC) and the Biosafety and Biotechnology Unit (SBB), and acts as a focal point for information and scientific expertise related to biosafety aspects. Besides ensuring consistency and harmonisation in the evaluation of GMO risk assessments, it seeks to complement its internal expertise by exchanging views with the wider scientific community in order to anticipate all relevant issues raised during GMO risk assessment. These regular exchanges between experts involved in risk assessment/evaluation and scientists involved in basic or applied research facilitate the gathering of data obtained from scientific research relevant to the risk assessment and keep expertise in risk assessment science-based, reliable and open to scientific controversy.

The BAC and the SBB have a long tradition of building bridges between the communities of risk evaluators/assessors and researchers. Approaches have involved attending or organising expert meetings that address specific or transversal topics associated with GMO risk assessment, collaboration within the framework of scientific advising and the publication of guidance documents and/or peer-reviewed papers *(1)*.

A more recent initiative was the organisation by the SBB of a symposium that brought scientists together who are interested or involved in biosafety-related issues and whose expertise may contribute to a better evaluation of the potential risks associated with the use of GMOs *(2)*. A joint and multidisciplinary forum was created, composed of participants from academia, advisory bodies and biotech companies, thereby enabling a fruitful exchange of information, thoughts and views. Through numerous examples and discussions, the symposium illustrated how research efforts in diverse disciplines may contribute to the science-based risk assessment of GMOs. Some challenges were addressed such as the use and interpretation of results generated by basic and applied research, or the importance of framing scientific experiments correctly (setting up good risk hypothesis) that are relevant to risk assessment, in order to guide the generation and interpretation of data. A question that emerged repeatedly is how far the generation and collection of new data should go, since having more data does not necessarily mean having more certainty in the risk assessment. The symposium also showed that uncertainties or knowledge gaps identified during the risk assessment process, as well as the emergence of new types of GMOs or new techniques of genetic modification (see below), can trigger new scientific research. It was also mentioned that in some cases risk assessment could benefit from the use of new tools and approaches, such as the use of profiling techniques ('omics').

Expertise in GMO risk assessment will have to adapt continuously and become increasingly dynamic, multidisciplinary and accessible in order to address specific challenges linked to the latest developments in biotechnology. Such developments include: GMOs that have been modified for improved nutritional quality (e.g. reduced saturated fatty acids or vitamin-enrichment) or for the production of biofuels or bioplastics; the deliberate release of GMOs that have been developed from host systems other than crops (e.g. trees, animals); organisms obtained by techniques that aim to modify the gene expression profile without altering the nucleotide sequence (epigenetic engineering); organisms/products obtained via 'synthetic biology' or targeted gene modification techniques (e.g. use of single-stranded oligonucleotides or engineering nucleases). The risk assessment of these new types of GMOs is likely to raise questions such as: are the current assessment methodology and principles appropriate? Do these GMOs raise specific safety concerns? Is it necessary to develop guidelines that specifically address their risk assessment? How can sufficient and relevant scientific data be generated to fuel risk assessments?

In future, initiatives aiming at identifying and calling upon research that is beneficial for the risk assessment of GMOs will remain important in order to ensure access to relevant expertise. Scientific uncertainties identified during risk assessments should ideally serve to stimulate new research. Facilitating access to existing data obtained from basic research could also be encouraged, for example through large open-access databases of biosafety studies.

As a conclusion, initiatives undertaken by the SBB and the BAC to further develop synergies should be continued. Existing or new scientific networks and fora, as well as the organisation of scientific events, could be further exploited to promote awareness and further build upon the gathered knowledge and expertise.

## References

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2. **Pauwels K, Breyer D, De Schrijver A, Goossens M, Herman P.** Contributions from scientific research to the risk assessment of GMOs. Lessons learned from a symposium held in Brussels, Belgium, 21-22 October 2010. Environment Biosafety Res 2010;9(3):113-121.