

AOAC Europe Section initiative on «Best Practices for Bioassay Testing of Food and other Complex Mixtures»

Bioassays are used increasingly to assess safety of complex mixtures, including foods; however, they are typically validated for the use with pure chemicals and not appropriate for food or other complex mixtures. AOAC Europe section started a new initiative focused on the development of best practices for bioassay testing of food and other complex mixtures and initiated discussion about the use and application of in vitro assays within the end-to-end process starting from screening of bioactive compounds in mixtures to the characterization of individual compounds for risk assessment purposes. Certainly, the progress in the in vitro field has been a fundamental driver bringing promising solutions to address complex systems. There are, however, underlying issues in the in vitro field that need further attention to avoid misinterpretations: what is being measured when assessing biological activity or activities? Critical limiting factors related to the accuracy and precision for biological testing are still missing. Contributing factors to these gaps include the integration of fundamental upstream boundaries including sample preparation and lack of best laboratory practices. A framework for the assessment and harmonization of the validity of in vitro studies is needed to build robust ground for reliable data analyses and therefore biological interpretation towards their acceptance.

Participants to this initiative includes experts and stakeholders from environmental, food & beverages industry, regulators & government, academia, contract research laboratories, and technology providers.

The addressed topics include the following points:

1. Need for methodology harmonization (from sample preparation and extraction to suitable biological assessment);
2. Best practices for in vitro methodologies (e.g., dose-response effect, quality criteria, validation and qualification requirements, reporting, historical control data, acceptability criteria);
3. Regulatory landscape to enable driving forward the acceptance of new approach methodologies for mixtures.

The current status of the «Best Practices for Bioassay Testing of Food and other Complex Mixtures» initiative will be discussed during the AOAC INTERNATIONAL Annual meeting in Baltimore (August 23-28, 2024; <https://www.aoac.org/2024-annual-meeting-exposition/>) and dedicated workshop with working groups is planned for November 4, 2024 in Prague, Czech Republic, during the International Symposium on Recent Advances in Food Analysis (November 5-8, 2024; <https://rafa2024.eu/>)