Committee on Mutagenicity



**MUT/2022/13**

**COMMITTEE ON MUTAGENICITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT (COM)**

## Draft non-expert summary for COM document: Guidance on a strategy for genotoxicity testing of chemicals

1. It was agreed at the COM meeting in June 2022 that the general public could benefit from the addition of non-expert summaries to the start of each COM guideline document.

2. The paper provided at Annex A is a draft non-expert summary for the overarching COM guideline, 'Guidance on a strategy for genotoxicity testing of chemicals'.

## Questions for the Committee

3. Members are asked to consider the draft summary and, in particular, to:
   i. Comment on whether the language used is consistent with that for a non-expert person.
   ii. Consider whether the draft summary provides an accurate overview of the COM 'Guidance on a strategy for genotoxicity testing of chemicals.
   iii. Consider the level of explanation needed - for example should we define in vitro?

**IEH Consulting under contract supporting the PHE COC and COM Secretariat**
**October 2022**

Committee on Mutagenicity

This is a paper for discussion. It does not represent the views of the Committee and must not be quoted, cited or reproduced.

**MUT/2022/13 – Annex A**

**COMMITTEE ON MUTAGENICITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT (COM)**

# Draft non-expert summary for COM document: Guidance on a strategy for genotoxicity testing of chemicals

Draft non-executive summary for COM overarching guidance document.

**Secretariat**

**October 2022**

Committee on Mutagenicity



The Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment (COM) is an independent expert advisory committee whose members have expertise specific to the field of mutagenicity and genotoxicity and serve in their own capacity as independent experts, or are Lay Members who provide a wider perspective and assist in communication of discussions to a general readership.

COM provides advice to UK government departments and agencies with an interest in the safety of chemicals on both the inherent mutagenic or genotoxic properties (hazard) of the chemical of interest and/or the likelihood of adverse effects occurring after exposure (risk). In addition, COM advice on strategies and research for genotoxicity testing through publication of a number of guidelines. The first COM guidelines for the testing of chemicals for mutagenicity were published in 1981, and these were revised in 1989, 2000 and 2011 to reflect advances in development and validation of methods.

This document provides a further revision of the guidance and outlines the strategy that COM considers to be the most scientifically appropriate given currently available methods and recognises the need to avoid the use of live animals (in vivo studies) where practical and validated alternative methods (for example, in vitro studies) are available.

A staged approach is recommended by COM for the genotoxicity testing of chemicals.

Stage 0 considers available information regarding the physical and chemical (physico-chemical) properties of the chemical under investigation, identification of any relationship between chemical structure and biological activity (structure activity relationships (SAR)) and data from scaled down in vitro assays used for screening large numbers of test chemicals.

Stage 1 consists of in vitro genotoxicity tests that allow identification of three types of genetic damage, i.e., to genes, chromosome structure (clastogenicity) and/or number of chromosomes (aneuploidy). Core tests comprising the 'Ames test' and the 'in vitro micronucleus test' are advised by COM which is sufficient to detect chemical genotoxins.

Stage 2 consists of core in vivo genotoxicity tests. The 'rodent micronucleus/chromosome aberration assay' detects aneuploidy and clastogenicity and the 'transgenic rodent gene mutation assay' and the 'rodent alkaline comet assay' assess DNA damage.

For most chemicals the core in vivo tests are sufficient to evaluate whether a chemical can cause genotoxicity in the human body, which is a primary concern in the development of some cancers. However, in some cases further in vivo studies may need to be carried out to provide more detailed information as to the toxic response or to determine how the chemical causes genotoxicity (mode of genotoxic action).