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**PHARMACEUTICAL INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YY/T 0870.7-2023

**Test for genotoxicity of medical devices - Part 7: In vivo
mammalian alkaline comet assay**

医疗器械遗传毒性试验 第7部分：哺乳动物体内碱性彗星试验

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules for Standardization Documents" drafting. This document is Part 7 of YY/T 0870 "Genotoxicity Tests for Medical Devices". YY/T 0870 has issued the following parts.

- 1. Bacterial reverse mutation test;
- 2. Chromosomal aberration test of mammalian cells in vitro;
- Part 3: TK gene mutation test with mouse lymphoma cells;
- 4. Mammalian bone marrow erythrocyte micronucleus test;
- 5. Mammalian bone marrow chromosome aberration test;
- 6. In vitro mammalian cell micronucleus test;
- 7. In vivo alkaline comet test in mammals. Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed by the State Drug Administration. This document is under the jurisdiction of the National Standardization Technical Committee for Biological Evaluation of Medical Devices (SAC/TC248). This document was drafted by: Shandong Medical Device and Drug Packaging Inspection Research Institute, Sichuan University (Sichuan Medical Device Biomaterials and Manufacturing Product Inspection Center), Beijing Medical Device Inspection Institute. The main drafters of this document. Sun Lingxiao, Liu Zengxiang, Jia Lifang, Dai Zhengning, Wang Guowei, Li Qiu, He Xueying, Fan Chunguang.

The alkaline comet test in mammals is recommended in the subsequent evaluation steps of the genotoxicity test strategy specified in GB/T 16886.3 An in vivo test method. The test methods for detecting potential genotoxicity recommended in GB/T 16886.3 have all been

listed in the Economic Co-operation and Development Group Organization (OECD) "Guidelines for Testing Chemicals", but these methods are formulated for the characteristics of chemicals, and no detailed testing is given. Therefore, it is not suitable for direct use in the testing of medical devices/materials. This document is given in GB/T 16886.3 for the detection of potential genetic. On the basis of the basic principles of safety, detailed test procedures are stipulated according to the characteristics of medical devices/materials, which can be used as the legacy of GB/T 16886.3. Supplementary to the method of toxicity test. YY/T 0870 aims to establish specific test methods for genotoxicity of medical devices, and it is planned to consist of 7 parts.

1. Bacterial reverse mutation test. The purpose is to give detailed tests for bacterial reverse mutation tests of medical devices/materials method.

2. Chromosomal aberration test in mammalian cells in vitro. The purpose is to give medical devices/materials in vitro mammalian Detailed test method of cytochromosomal aberration test.

--- Part 3: TK gene mutation test with mouse lymphoma cells. The purpose is to give mice for medical devices/materials Detailed test method for TK gene mutation test performed on lymphoma cells.

4. Mammalian bone marrow erythrocyte micronucleus test. The purpose is to give medical devices/materials to mammalian bone marrow red blood cells Detailed test method for the micronucleus test.

1 Scope

YY/T 0870.7 specifies the in vivo alkaline comet assay as applied to medical devices. The comet assay detects DNA strand breaks in individual cells, and running it in vivo answers a question the in vitro tests cannot: whether a substance released by a device damages DNA in the tissues it actually reaches, after absorption, distribution and metabolism. It is the test regulators turn to when an in vitro result is positive or equivocal and the question is whether that finding matters in a living animal. This document sets out how the assay is conducted for device materials, how the tissues are sampled and how the result is scored and interpreted. For a manufacturer whose biological evaluation has hit a genotoxicity signal, this is the follow-up a Chinese reviewer expects.

This document specifies the mammalian in vivo alkaline comet test method for genotoxicity testing of medical devices/materials. This document is applicable to the screening of medical devices by measuring the breakage of DNA strands in the nucleus of mammalian cells caused by medical devices/materials whether the machinery/material has potential genotoxic effects. NOTE. In vivo alkaline comet assays in mammals for nanomaterials and cross-linkers may require specific revisions to the methods in this document, but this paper The item is not described.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 16886.1 Biological evaluation of medical devices Part

3 Terms and Definitions

The following terms and definitions defined in GB/T 16886.1, GB/T 16886.3 and GB/T 16886.12 apply to this document.

3.1 comet comet The tailing phenomenon of damaged DNA fragments after being subjected to an electric field. NOTE. Under the microscopic image, the "comet" head is nuclear DNA, and the tail is composed of damaged DNA fragments that migrated out of the nucleus in the electric field.

3.2 critical variable A test parameter for which small changes can have a large impact on test results. NOTE. Key variables may be tissue-specific. In an experiment, changing key variables can lead to changes in the results of the experiment, for example. positive control and negative Dosage and type of sex control.

3.3 Tail DNA % tailDNA The ratio of comet tail DNA content to total DNA content (sum of head and tail DNA content). NOTE. Tail DNA percentage reflects the relative degree of DNA damage expressed as a percentage. **3.4 "Hedgehog"-shaped cells hedgehogcells** Microscopic image of cells consisting of small or indistinct heads with large diffuse tails.