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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 45350-2025

Laboratory animal - Single nucleotide polymorphisms marker methods for inbred mice and rats

实验动物 近交系小鼠、大鼠SNP标记检测法

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Standardization Administration of the PRC

Table of Contents

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 under the jurisdiction of the National Technical Committee for Laboratory Animal Standardization (SAC/TC281). This document was drafted by: China Food and Drug Administration, Shanghai Experimental Animal Research Center, Shaanxi Institute of Traditional Chinese Medicine, Shanxi Medical University University of Science and Technology, Guangdong Provincial Laboratory Animal Monitoring Institute. The main drafters of this document are. Wei Jie, Wang Hong, Yue Bingfei, Zhao Ying, Li Huan, Zhou Jiaqi, Zhao Liya, Tang Jianping, Yao Yangzheng, Song Guohua, Wang Jing, Fan, Chun, and Chen, Guoqiang.

0.1 The issuing authority of this document draws attention to the fact that claims of compliance with this document may involve differences between

6.2 Inbred rat testing (LDR method) and large rat testing. The use of patents related to mouse SNP loci detection in inbred rats. The issuing organization of this document takes no position on the authenticity, validity and scope of this patent. The patent holder has promised to the issuing agency of this document that he is willing to cooperate with any applicant under reasonable and non-discriminatory terms and conditions. Negotiate a patent license. The patent holder's statement has been filed with the issuing authority of this document. Contact information. Name of patent holder. Zhao Ying, Tang Jianping, Zhao Liya, Nie Yanyan, Jiang Shan, Fan Chun, Chen Guoqiang, Gu Xiaoxue, Shen Miao, Feng Yan. Address. No. 3577, Jinke Road, Pudong New District, Shanghai. Please note that in addition to the above patents, some of the contents of this document may still involve patents. The issuing agency of this document does not assume the responsibility for identifying patents. responsibility.

0.2 A clear genetic background is a prerequisite for inbred mice and rats to be used in

production, testing, research and development, etc. In order to improve the genetic quality and standardization level of laboratory mice and rats, my country has issued and implemented GB/T 14927.1 "Genetic Quality and Standardization of Inbred Mice and Rats in Laboratory Animals" GB/T 14927.2 "Laboratory Animal Inbred Mice and Rats Immunological Marker Detection Method", these two standards The detection method is limited to protein level, which makes it difficult to identify and evaluate multiple strains of inbred mice and rats, especially substrains. The "Genetic Quality Control of Plants" recommended the use of molecular biological methods to monitor genetic quality, but there is no corresponding technical method. The document evaluates the genetic quality of inbred mice and rats by measuring relevant SNP markers, which can better improve the genetic quality of inbred mice and rats. Improve the genetic quality of mice and promote the improvement of their standardization level and application value. Experimental Animals Inbred Mouse, Rat SNP Label detection method

1 Scope

GB/T 45350-2025 gives the Chinese SNP marker method for the genetic monitoring of inbred mice and rats. An inbred strain is the fundamental reagent of biomedical research, and its value rests entirely on its genetic uniformity: contamination by another strain, or genetic drift within a colony, invalidates the experiments done with it and is invisible without testing. SNP panels have replaced the older biochemical and microsatellite markers because they are cheap, dense and unambiguous. The standard sets the principle, the reagents, materials and equipment, the sampling of animals from a colony and the extraction of DNA, the SNP loci constituting the panel, the genotyping procedure and the platform requirements, the quality control and the criteria for a valid run, the interpretation of the genotypes against the expected strain profile, the judgement of whether the colony is genetically qualified or contaminated, and the records and report. It took effect on 28 February 2025.

This document describes the detection method and judgment criteria for single nucleotide polymorphism (SNP) markers in inbred mice and rats of experimental animals. This document is applicable to the genetic composition analysis, strain identification and quality control of inbred mice and rats as experimental animals.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB 14923-2022 Genetic quality control of laboratory animals

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 single nucleotide polymorphisms; SNP DNA sequence polymorphism caused by positional conversion, transversion, insertion or deletion of a single nucleotide at the genomic level.

3.2 Ligase detection reaction ligase detective reaction; LDR A method for identifying gene polymorphic sites using high temperature ligase.

Note. Once the high temperature ligase detects a base mismatch of the gene point mutation type at the corresponding position between the DNA and the two complementary oligonucleotide adapters, it will ligate. The reaction cannot proceed.

3.3 Homozygosity The state of having identical alleles at relative positions on homologous chromosomes.

Note. Inbred animals have homozygous genotypes at most loci through continuous inbreeding. Also homozygous.

4 Reagents and instruments

4.1 Reagents DNA extraction kit, PCR reaction and product purification kit, sequencing reaction kit, agarose.

4.2 Experimental equipment and instruments

4.2.1 Instruments and equipment. electrophoresis apparatus, centrifuge, PCR instrument, UV gel imaging system, genetic analyzer, water bath, microwave oven, mixing shaker Oscillator.