YY

PHARMACEUTICAL INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

YY/T 1182-2020

Nucleic acid amplification test reagents (kits)

核酸扩增检测用试剂(盒)

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1 Scope

YY/T 1182 is the general product standard for nucleic acid amplification test kits in China, covering the format rather than a single target. PCR and related amplification methods underpin a large and growing share of the diagnostic catalogue, from infectious disease to oncology to genetic testing, and the properties that decide whether such a kit works, limit of detection, specificity against related sequences, inhibitor tolerance and the controls that reveal a failed run, are common to all of them. Fixing them once at format level is what lets analyte-specific requirements be added on top. For a manufacturer or a distributor registering a molecular assay in China, this is the standard underneath the analytical validation.

This Standard specifies the terms and definitions, classification technical requirements, test methods, labels and instructions, packaging, transportation and storage of nucleic acids amplification test reagents (kits) [hereinafter referred to as "reagents (kits)"]. This Standard applies to the quality control of nucleic acids amplification test reagents (kits). Nucleic acids amplification methods include polymerase chain reaction (PCR) technology and isothermal nucleic acid amplification technology. This Standard does not apply to the following products:

a) reagents (kits) for blood source screening;

b) reagents (kits) for gene sequencing. This Standard is a general standard for nucleic acids amplification test reagents (kits). For products or reagents (kits) with special standards, corresponding product standards or technical requirements should be formulated according to product characteristics and special standard requirements.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 21415-2008, In vitro diagnostic medical devices - Measurement of quantities in biological samples - Metrological traceability of values assigned to calibrators and control materials

GB/T 29791.2, In vitro diagnostic medical devices - Information supplied by the manufacturer (labelling) - Part 2: In vitro diagnostic reagents for professional use

3 Terms and definitions

The following terms and definitions are applicable to this document.

b) According to the principle of nucleic acid amplification, it can be divided into: variable temperature amplification detection kit and isothermal amplification detection kit;

c) Classify according to methodologies; examples of common methodologies: PCR-fluorescent probe method, PCR-fluorescent dye method, PCR- melting curve method, multiple fluorescence PCR method, RT-PCR fluorescence method, nested-PCR method, gap-PCR method, loop- mediated constant temperature amplification method.

5.1 General requirements

5.1.1 Appearance The reagents (kits) shall meet the appearance requirements that are specified by the manufacturer; the appearance requirements include but are not limited to the following: the reagents (kits) shall have complete components; the package shall be clean, free from leakage and damage; the signs and labels shall be clearly written.

5.1.2 Nucleic acid extraction function The nucleic acid extraction function shall meet the following requirements:

a) For reagents (kits) that contain nucleic acid extraction components, the manufacturer shall make appropriate requirements for nucleic acid extraction, and verify the nucleic acid extraction function. For example: fully consider the interference factors in the sample extraction process and the possible impact on the subsequent sample amplification process;

b) For reagents (kits) for which samples need to be extracted, but do not contain nucleic acid extraction components, the manufacturer shall state or specify the extraction reagents (kits) and provide verification or confirmation information;

c) For reagents (kits) which are directly amplified without sample extraction, the

manufacturer shall be able to provide sufficient evidence to prove the anti-interference of the enzymes in its products.

5.1.3 Internal standard and (or) control Manufacturers shall establish appropriate quality control procedures for the detection results of reagents (kits); they should reasonably set internal standard and (or) control in the reaction system according to the characteristics of their

5.2.6 Negative reference conformance rate When it is applicable, perform determination of the negative reference in the national reference or enterprise reference; the detection result shall be positive. The reference settings follow the following principles:

a) Contain a certain number of samples without test substance;

b) Fully consider factors such as possible interference, crossover, non- specific. For example: containing a certain number of other samples that are similar to the tested species, of the same infection site, or similar infection symptoms;

c) When it is applicable, include a certain number of genotypes that are not within the declared detection range of the reagent (kit).

5.2.7 Detection limit The manufacturer shall specify and provide the detection limit of the reagent (kit); the establishing and verifying method of the detection limit of the reagent (kit) shall be scientific and feasible. Perform determination of the detection limit reference of the national reference or enterprise reference; the detection result shall meet the requirements of the national reference or enterprise reference.

5.2.8 Precision The precision within the batch shall meet that the coefficient of variation (CV, %) of the detected concentration log value is <= 5%. When the sample concentration is low, the coefficient of variation (CV, %) of the detected concentration log value is <=10%.

5.2.9 Stability The following methods can be selected for verification:

a) Stability of validity period: the manufacturer shall specify the validity period of the product. Under the storage conditions that are stipulated by the manufacturer, take samples of the nearest validity period to test 5.1, 5.2.2 ~ 5.2.8; the results shall meet the corresponding requirements;

6.3 Qualitative reagents

6.3.1 Positive reference conformance rate Operate according to the instructions of the reagent (kit); perform a detection of the positive reference in the national reference or enterprise reference; the detection result shall meet the requirements of 5.3.1.

6.3.2 Negative reference conformance rate Operate according to the instructions of the reagent (kit); perform a detection of the negative reference in the national reference or enterprise reference; the detection result shall meet the requirements of 5.3.2.

6.3.3 Limit of detection Operate according to the instructions of the reagent (kit); perform a detection of the detection limit reference in the national reference or enterprise reference; the result shall meet the requirements of 5.3.3.