PD CEN/TS 16835-2:2015

BSI Standards Publication

Molecular in vitro diagnostic examinations — Specifications for pre-examination processes for venous whole blood

Part 2: Isolated genomic DNA

Currently in preview, click buy full version

bsi.

...making excellence a habit.™

National foreword

This Published Document is the UK implementation of CEN/TS 16835-2:2015.

The UK participation in its preparation was entrusted to Technical Committee CH/212, IVDs.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2015.
Published by BSI Standards Limited 2015

ISBN 978 0 580 85033 2
ICS 11.100.30

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2015.

Amendments/corrigenda issued since publication

Date	Text affected

currently in preview, click buy full versi

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 16835-2

October 2015

ICS 11.100.30

English Version

Molecular in vitro diagnostic examinations - Specifications for pre-examination processes for venous whole blood - Part 2: Isolated genomic DNA

Tests de diagnostic moléculaire in vitro - Spécifications relatives aux processus pré-analytiques pour le sang total veineux - Partie 2: ADN génomique extrait

Molekularanalytische in-vitro-diagnostische Verfahren - Spezifikationen für präanalytische Prozesse für venöse Vollblutproben - Teil 2: Isolierte genomische DNA

This Technical Specification (CEN/TS) was approved by CEN on 31 August 2015 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2015 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. CEN/TS 16835-2:2015 E

Currently in preview, click buy full version

Contents

Page

European foreword ... 3

Introduction ... 4

1 Scope ... 5

2 Normative references ... 5

3 Terms and definitions ... 5

4 General considerations ... 7

5 Outside the laboratory ... 7
5.1 Primary venous whole blood collection manual ... 7
5.1.1 Information about the primary sample donor ... 7
5.1.2 Selection of the venous whole blood collection tube by the laboratory ... 8
5.1.3 Primary venous whole blood sample collection from the patient and stabilization procedures ... 8
5.1.4 Information on the primary blood sample and storage requirements at the blood collection facility ... 8
5.2 Transport requirements ... 9

6 Inside the laboratory ... 10
6.1 Primary sample reception ... 10
6.2 Storage requirements ... 10
6.3 Isolation of the genomic DNA ... 11
6.3.1 General ... 11
6.3.2 Using commercial kits ... 12
6.3.3 Using the laboratories own protocols ... 12
6.4 Quantity and quality assessment of isolated genomic DNA ... 12
6.5 Storage of isolated genomic DNA ... 13

Annex A (informative) **Impact of preanalytical workflow steps on venous whole blood genomic DNA quality** ... 14

A.1 General information on iterated experiments in Annex A ... 14

A.2 Influence of preanalytical variables (blood storage duration and temperature, and DNA isolation methods) on genomic DNA integrity ... 14

A.3 Influence of blood storage time on the genomic DNA integrity ... 15

A.4 Influence of genomic DNA integrity on an analytical test based on long PCR amplicon ... 17

A.5 Influence of blood storage conditions on the performance of PCR tests based on short amplicons ... 18

Bibliography ... 20

Currently in preview, click buy full version

European foreword

This document (CEN/TS 16835-2:2015) has been prepared by Technical Committee CEN/TC 140 "In vitro diagnostic medical devices", the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Currently in preview, click buy full version

Introduction

Molecular *in vitro* diagnostics has enabled a significant progress in medicine. Further progress is expected by new technologies analysing signatures of nucleic acids, proteins, and metabolites in human tissues and body fluids. However, the profiles of these molecules can change drastically during primary sample collection, transport, storage and processing thus making the outcome from diagnostics or research unreliable or even impossible because the subsequent analytical assay will not determine the situation in the patient but an artificial profile generated during the pre-examination process.

A standardization of the entire process from primary sample collection to genomic DNA analysis is needed due to genomic DNA degradation and fragmentation after blood collection. Studies have been undertaken to determine the important influencing factors. This Technical Specification draws upon such work to codify and standardize the steps for venous whole blood genomic DNA analysis in what is referred to as the preanalytical phase.

Currently in preview, click buy full version

1 Scope

This Technical Specification recommends the handling, documentation and processing of venous whole blood specimens intended for genomic DNA analysis during the preanalytical phase before a molecular assay is performed. This Technical Specification covers specimens collected by venous whole blood collection tubes. This Technical Specification is applicable to molecular *in vitro* diagnostic examinations (e.g. *in vitro* diagnostic laboratories, laboratory customers, *in vitro* diagnostics developers and manufacturers, institutions and commercial organizations performing biomedical research, biobanks and regulatory authorities).

Blood genomic DNA can fragment or degrade after blood collection. Therefore, special measures need to be taken to secure good quality blood samples for genomic DNA analysis. This is particularly relevant for analytical test procedures requiring high molecular weight DNA.

Different dedicated measures need to be taken for preserving blood circulating cell free DNA, which are not described in this Technical Specification. Circulating cell free DNA in blood is covered in CEN/TS 16835-3, *Molecular in vitro diagnostic examinations — Specifications for pre-examination processes for venous whole blood — Part 3: Isolated circulating cell free DNA from plasma*.

Different dedicated measures need to be taken for collecting, stabilizing, transporting and storing capillary blood as well as for blood collected and stored by paper based technologies. These are not described in this Technical Specification.

DNA from pathogens present in blood is not covered by this Technical Specification.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 15189:2012, *Medical laboratories — Requirements for quality and competence (ISO 15189:2012, Corrected version 2014-08-15)*

ISO 15190, *Medical laboratories — Requirements for safety*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 15189:2012 and the following apply.

3.1
ambient temperature
unregulated temperature of the surrounding air

3.2
analytical phase
processes that start with the isolated analyte and include all kind of parameter testing or chemical manipulation for quantitative or qualitative analysis

3.3
blood genomic DNA stabilizers
compounds, solutions or mixtures that are made to minimize degradation and fragmentation of genomic DNA in a blood sample

Currently in preview, click buy full version