Documentary standards update for

Coronavirus Standards WG Steering Committee

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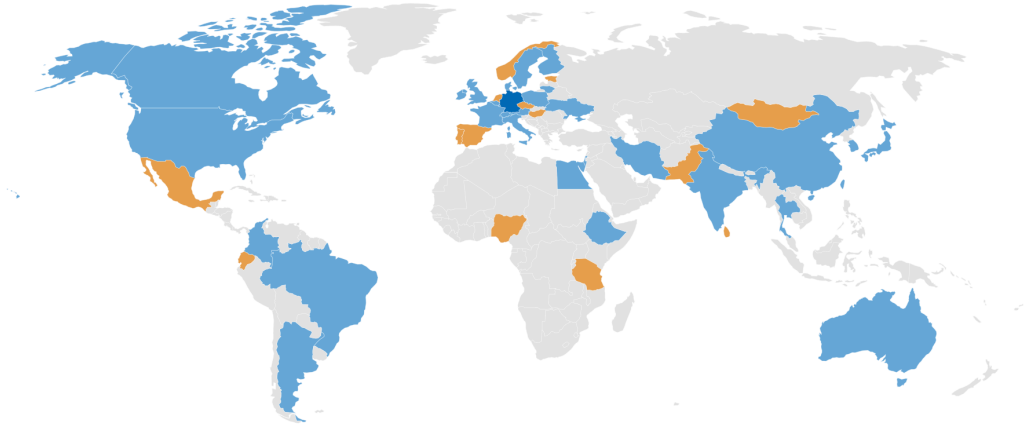
24 July 2020

TECHNICAL COMMITTEES

ISO/TC 276
Biotechnology



SCOPE

Standardization in the field of biotechnology processes that includes the following topics:

- Terms and definitions;
- biobanks and bioresources;
- analytical methods;
- bioprocessing;
- data processing including annotation, analysis, validation, comparability and integration;
- metrology.

ISO/TC 276 Biotechnology will work closely with related committees in order to identify standardization needs and gaps, and collaborate with other organisations to avoid duplications and overlapping standardization activities.

The committee will not pursue subjects within the scope of other TCs including but not limited to ISO/TC 212 and ISO/TC 34/SC 16.

Scope of ISO TC 276 WG3: Analytical Methods

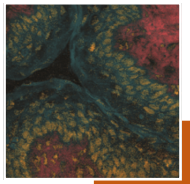
The Analytical Methods Working Group aims to develop standards for **accurate, reproducible and robust measurement and analysis** in support of biotechnologies.

WG 3 will develop a package of International Standards for **biologically relevant molecules and entities**, including nucleic acids, proteins, and cells.

This WG will develop horizontal standards and, when applicable, vertical / particular standards for industry sectors.

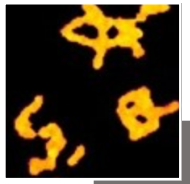
The WG will also coordinate with relevant technical committees and standardization initiatives.

Suite of standards to address all sectors of emerging biotechnology



By molecules & entities

- Nucleic acids*
- Protein
- Cells*
- Virus/viral vectors
- Others



By attribute

- Count*
- Purity*
- Viability
- Potency

By method

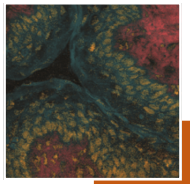
- qPCR/ddPCR*
- NGS*
- Genome Editing*
- Photometric*
- Microscopy*
- Flow cytometry
- ELISA

By application

- Cellular therapeutics*
- Biotechnology
- Biodiversity
- Infectious disease

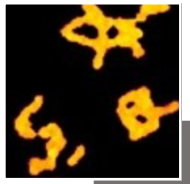
* Ongoing efforts or completed standards

Example: Analytical methods for supporting SARS-CoV-2 diagnostics and therapeutics



By molecules & entities

- **Nucleic acids**
- **Protein**
- **Cells**
- **Virus/viral vectors**
- Others



By attribute

- **Count**
- Purity
- Viability
- **Potency**

By technique

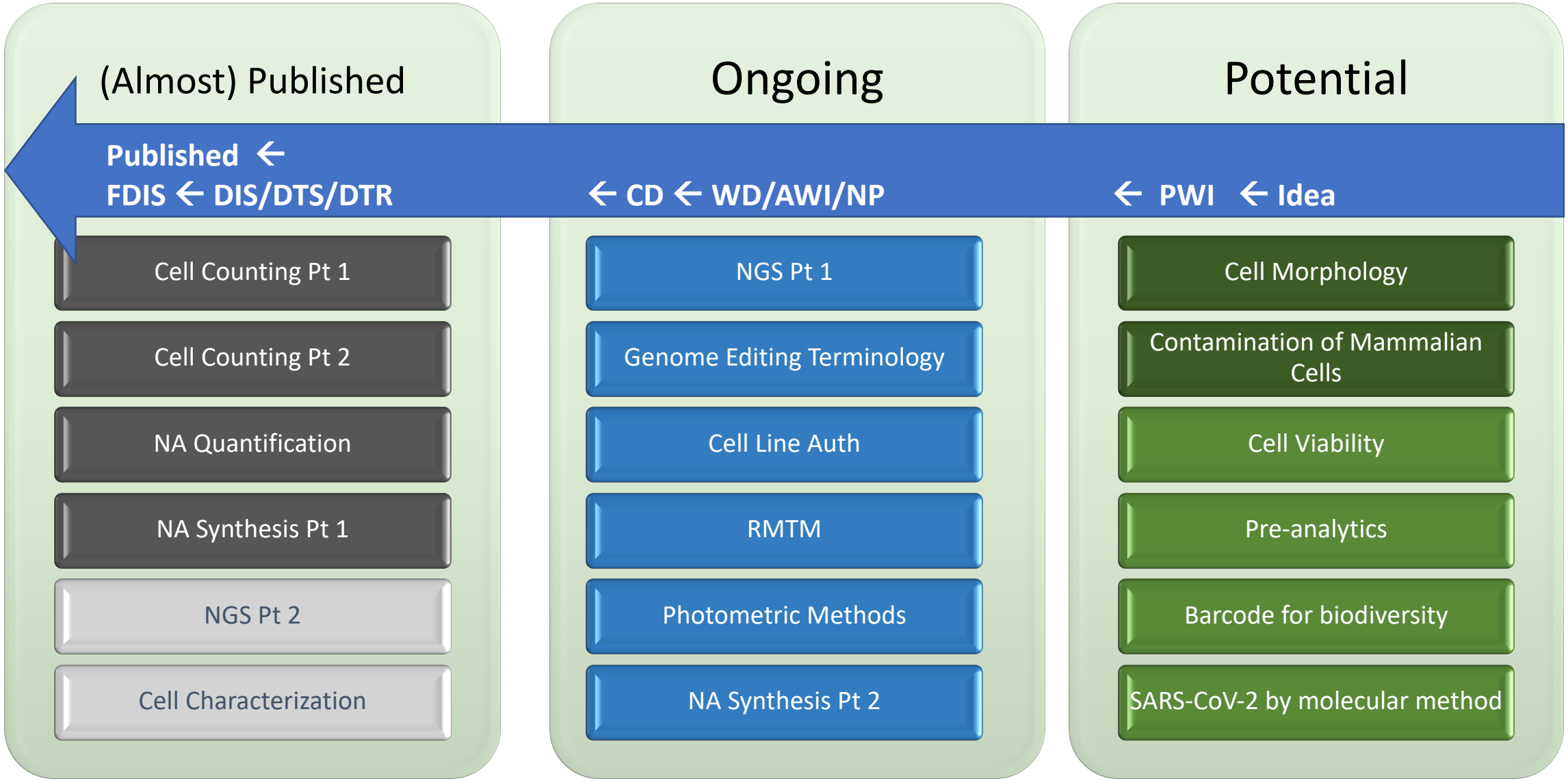
- **qPCR/ddPCR**
- **NGS**
- Genome Editing
- Photometric
- **Microscopy**
- **Flow cytometry**
- **ELISA**

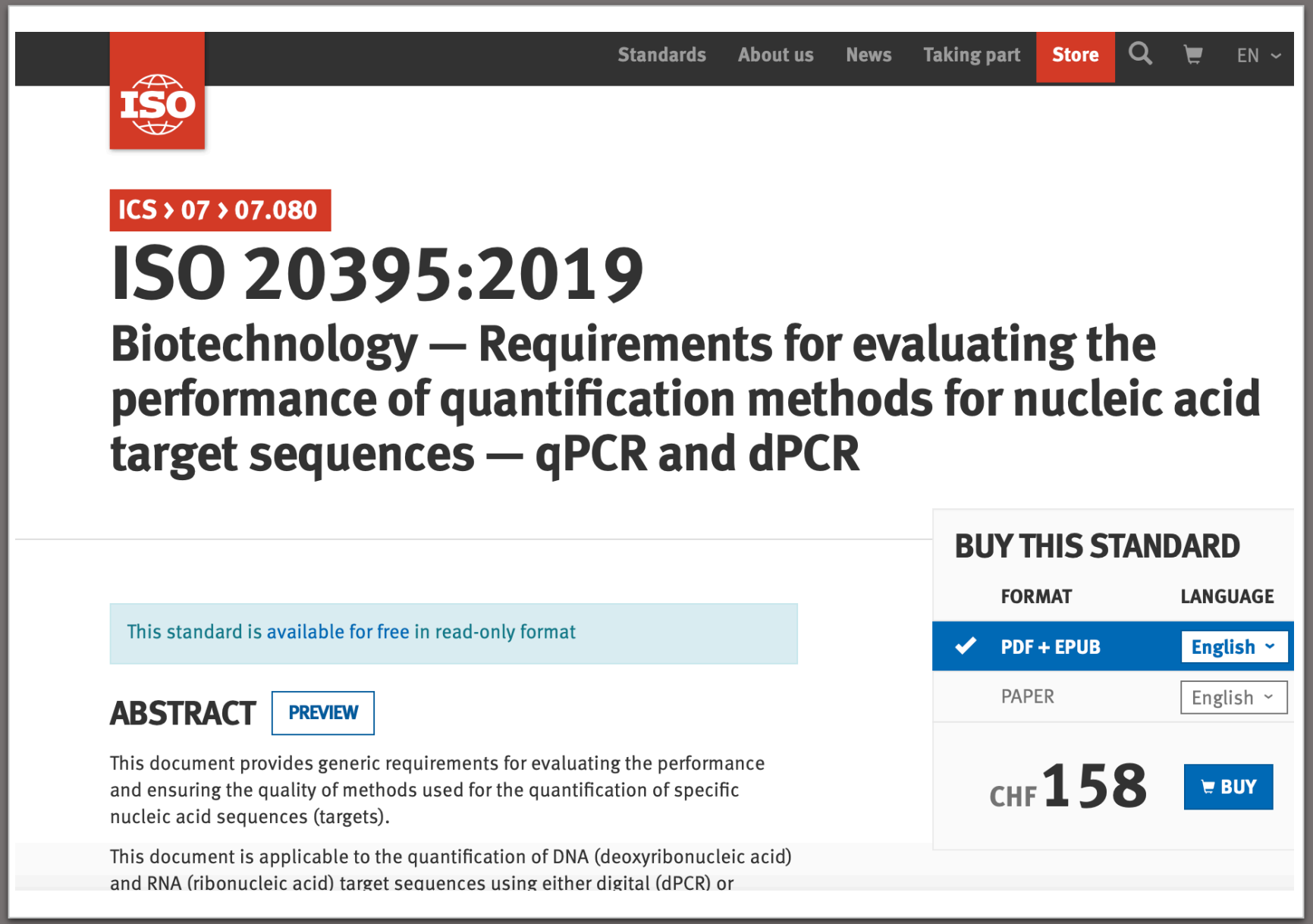
By application

- Cellular therapeutics
- Biotechnology
- Biodiversity
- **Infectious diseases (+ other ISO TC documents)**

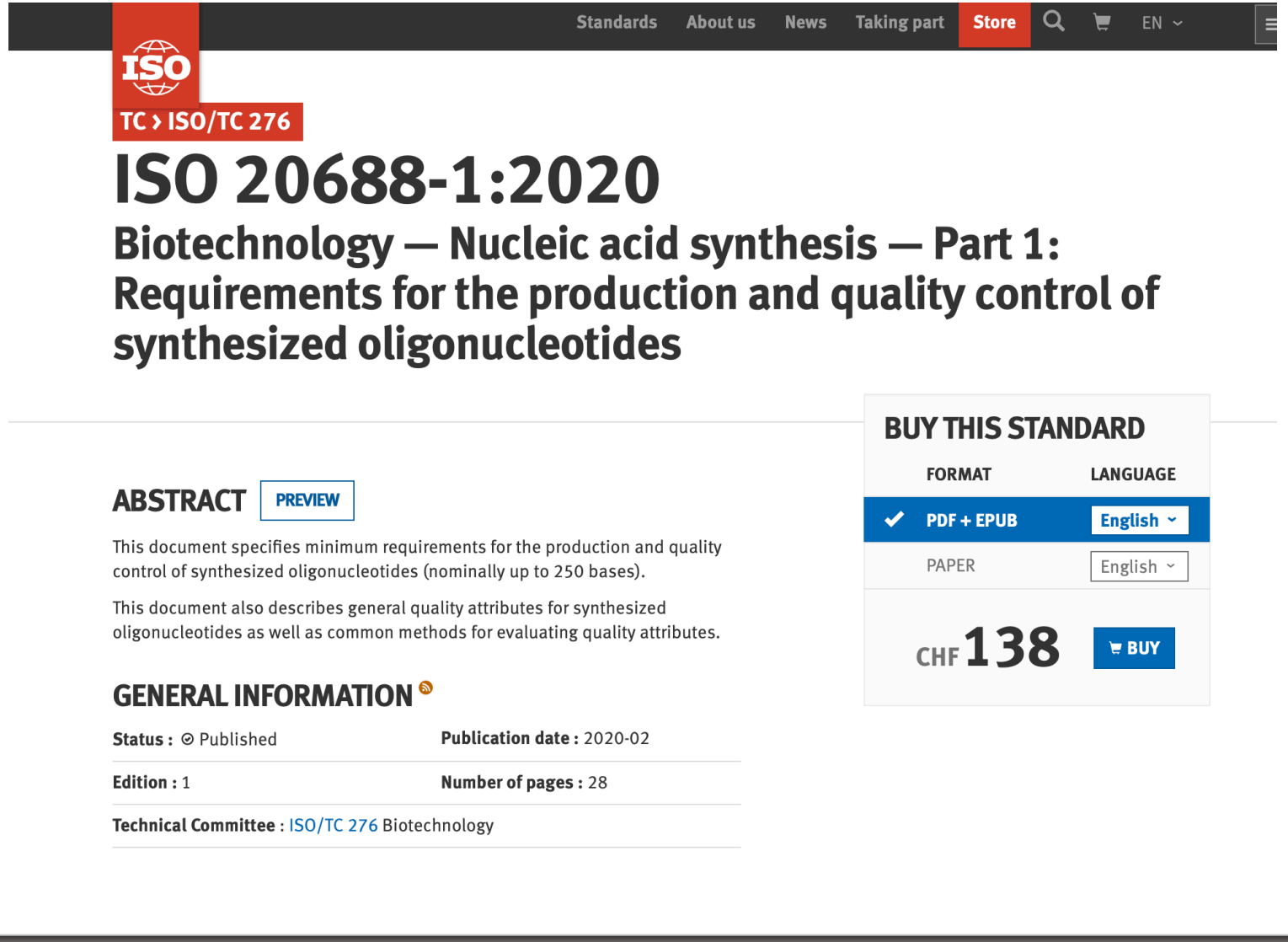
NOTE: For illustrative purpose only, may not be comprehensive or correct

WG3 Programme Summary





Relevant stds to COVID-19



Relevant stds to COVID-19

TC › ISO/TC 276

ISO/AWI 20688-2

Biotechnology — Nucleic acid synthesis — Part 2: General definitions and requirements for the production and quality control of synthesized gene fragment, gene, and genome

GENERAL INFORMATION

Status : ⊙ Under development

Edition : 1

Proposal from BGI and China National Institute of Standardization(CNIS): Considerations for quality evaluation for detecting Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) by RT-qPCR

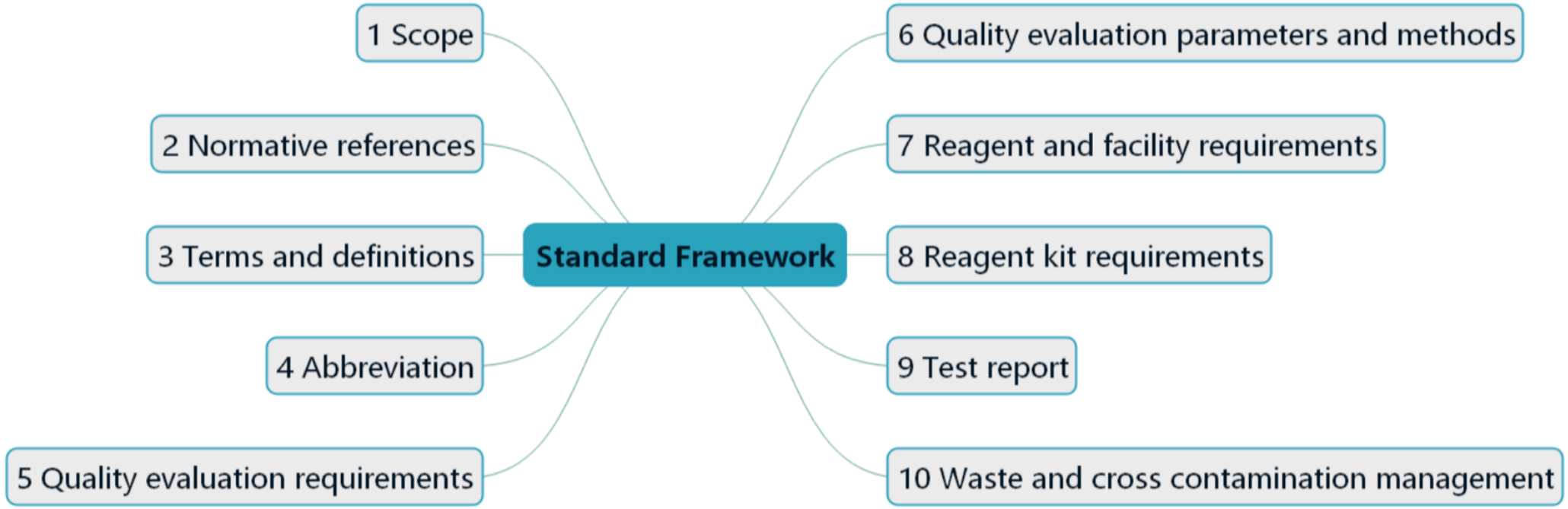
Scope

This document describes considerations for evaluation of assays for detecting Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) by RT-qPCR, including the terms and definitions, abbreviations, evaluation procedure, evaluation methodology, factors affecting the evaluation results and evaluation examples.

This document is applicable to the process of kit development and laboratories performing RT-qPCR testing for detection of SARS-CoV-2.

Version July 20, 2020

Standard proposal introduction



Presented during June ISO TC 276 Meeting

Standard proposal introduction

Scope:

This guidance documented the terms and definitions as well as the criteria, parameters and methods of quality evaluation for qRT-PCR testing for SARS-CoV-2.

Normative references:

ICS › 11 › 11.100 › 11.100.10

ISO 15198:2004

Clinical laboratory medicine — diagnostic medical devices — Validation of user quality contr procedures by the manufacture

ICS › 07 › 07.080

ISO 20395:2019

Biotechnology — Requirements evaluating the performance of quantification methods for nucl acid target sequences — qPCR a dPCR

ICS › 11 › 11.100 › 11.100.10

ISO 17511:2020

In vitro diagnostic medical devices — Requirements for establishing metrological traceability of values assigned to calibrators, trueness control materials and human samples

Presented during June ISO TC 276 Meeting

Standard proposal introduction

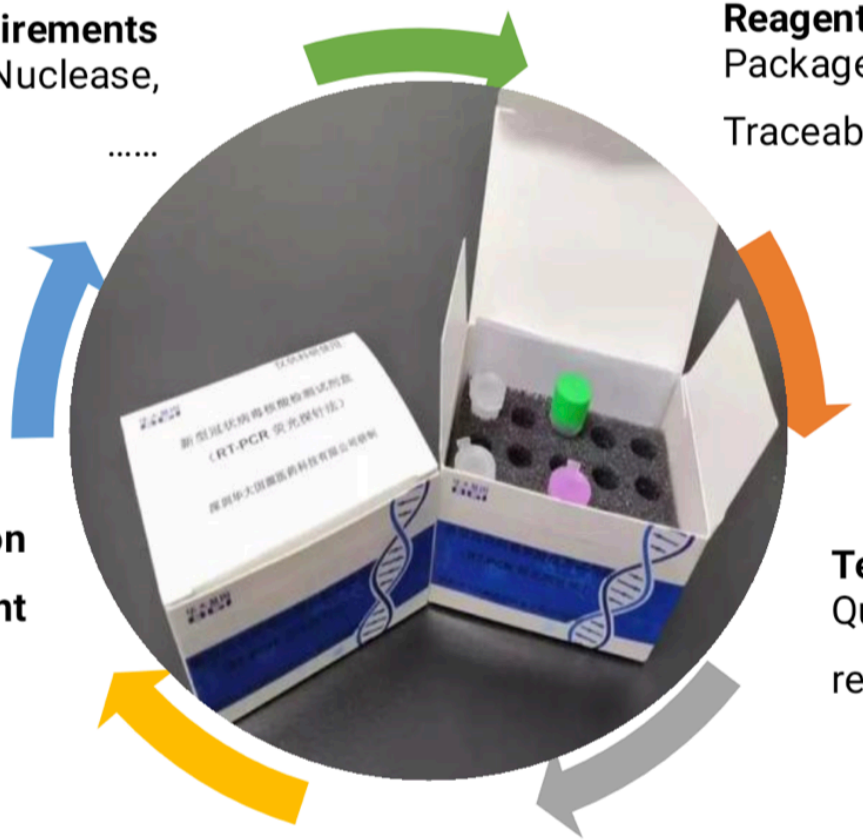
Evaluation parameters	Requirements
Nucleic acid extraction	Laboratories must test and validate the nucleic acid extraction kit for its nucleic acid extraction rate and nucleic acid purification efficacy.
Lower detection limit	Lower detection limit must be no more than 1×102 copies/mL.
Precision	Coefficient of Variation must be no more than 5 percent.
Specificity	Potential contamination by nucleic acid from other pathogen must be documented, including name, type and concentration of the pathogen.
Validation	Validation must be performed using reference material fulfilling national or international standard.
Stability	Factors that would impact reagent stability including period of validity, transportation, freezing and thawing.

Presented during June ISO TC 276 Meeting

Standard proposal introduction

Reagent requirements
Storage, Sterilization， Nuclease,
……

Reagent kit requirements
Package label, Instructive document,
Traceability document



Waste and cross contamination management

Test report：
Quality control report, Logic of result interpretation

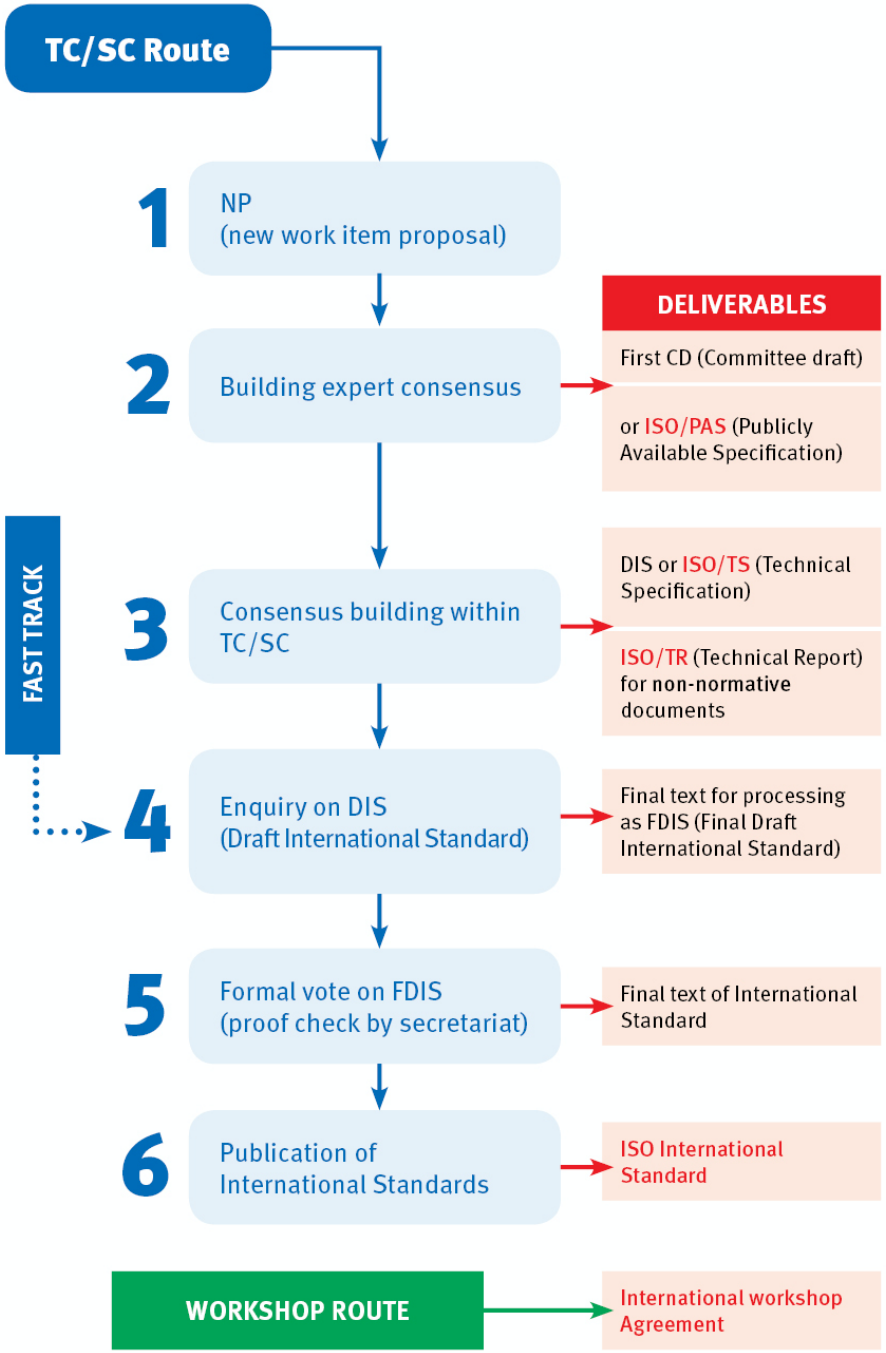
Presented during June ISO TC 276 Meeting

Considerations

Appropriate ISO technical deliverables

Coordination with other ISO Technical Committee(s)

Building consensus towards a global standard



Appropriate ISO technical deliverables

INTERNATIONAL STANDARDS

Provides rules, guidelines or characteristics for activities or for their results, aimed at achieving the optimum degree of order in a given context. Forms: Product standards, test methods, codes of practice, guideline standards and management systems standards.

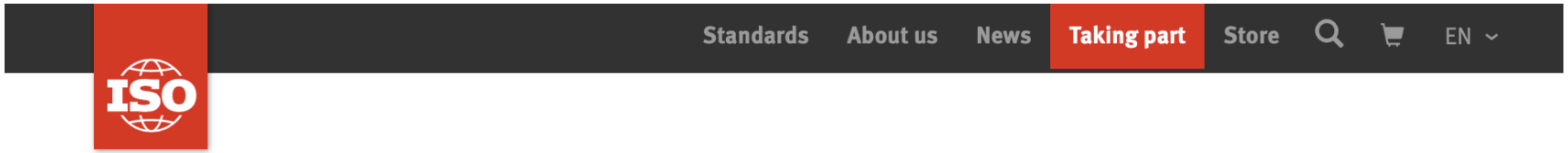
TECHNICAL SPECIFICATION

Addresses work still under technical development, or where it is believed that there will be a future, but not immediate, possibility of agreement on an International Standard.

TECHNICAL REPORT

Contains information of a different kind from that of the previous two publications. It may include data obtained from a survey, for example, or from an informative report, or information of the perceived “state of the art”.

Coordinated efforts



TECHNICAL COMMITTEES

ISO/TC 212

Clinical laboratory testing and in vitro diagnostic test systems

Scope: Standardization and guidance in the field of laboratory medicine and in vitro diagnostic test systems. This includes, for example, quality management, pre- and post-analytical procedures, analytical performance, laboratory safety, reference systems and quality assurance.

Coordinated effort (continued)

ISO/TC276 and ISO/TC212 agreed on a path forward:

- A joint working group (JWG) will form (Convened from TC212, with JWG Manager from TC276).
- Experts from both TC will be able to participate.

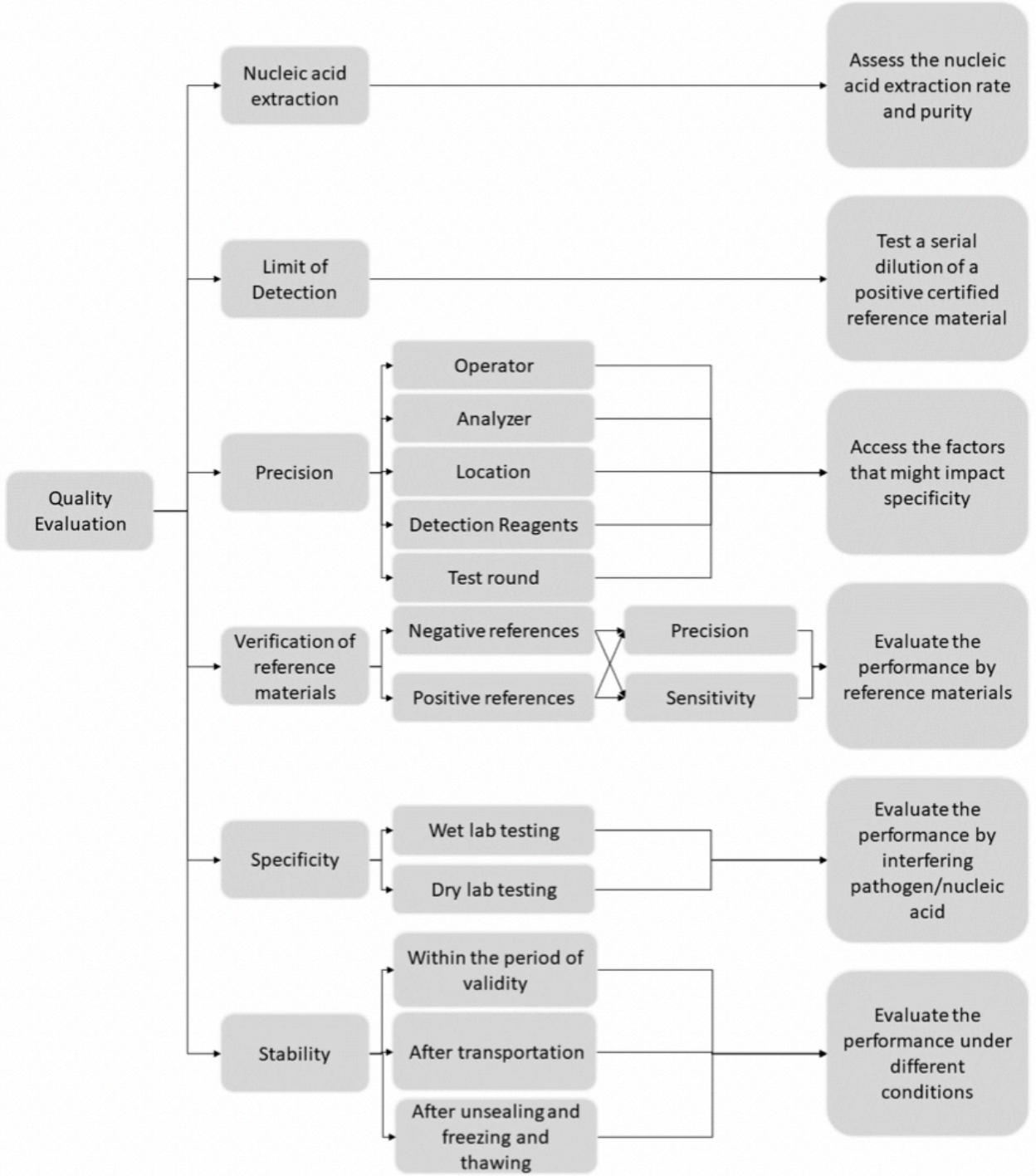
Next steps:

- Both TCs will put forward a resolution to form a JWG as soon as the scope of ISO/NP TR 20398 can be updated.
- Joint expert meeting to be schedule for the week of July 25, 2020
  - Review outline of document
  - Review and update scope/title statement
  - Derive a project management schedule with action items.

Building consensus

Version July 20, 2020

4. Technical procedure to evaluate the quality attributes



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5. Evaluation Methodology

- 5.1 Extraction / purification performance of nucleic acid (RNA)
- 5.2 Verification of the inclusiveness of virus samples in different regions
- 5.3 Metrology traceability
- 5.4 Precision
- 5.6 Specificity （Selective detection）
- 5.7 Stability
- 5.8 linearity
- 5.9 Conformity rate of reference materials
- 5.10 Instrument suitability
- 5.11 Sample types
- 5.12 Positive threshold

Version July 20, 2020

6. Factors affecting the evaluation results

- 6.1 Reagent and facility
- 6.2 Laboratory personnel
- 6.3 Package
- 6.4 Instructions
- 6.5 Waste and cross contamination

Reporting as an additional section?

Contents

Laboratory design

The new TC will stipulate technical design requirements for a diverse range of laboratories with different functions and responsibilities. It will include, but not limited to:

1. site selection and planning;
2. layouts and selection of model furniture (e.g. workbenches, fume hoods, safety showers, biological safety cabinets, etc);
3. electrical, water and gas supply systems, drainage, fire prevention, HVAC, auto-control and decoration;
4. laboratories featuring bio-safety, constant temperature and humidity, and other special laboratories;
5. laboratory safety, staff health and wellness, environmental protection, and energy saving;
6. Smart laboratory (Use of big data, cloud computing, Internet of things, blockchain, artificial intelligence and other digital technologies to monitor and control the environmental conditions of the laboratory, so as to have better performance operation of facilities, energy conservation, environmental protection and personnel health).

Purpose

- Note: the proposed TC will help laboratory design industry to address a wide range of global issues. Outbreaks of zoonotic disease like Avian Influenza (H5N1), Middle East Respiratory Syndrome (MERS), Ebola virus, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and Coronavirus (COVID-19) has highlighted the worldwide lack of adequate laboratory capacity, especially in low-resource environments. This proposal should address this situation, early during the design stage, by providing a standardised approach on laboratory function, health and safety, energy efficiency, environmental impact and regulatory compliance issues.

ISO Deliverables

	International Standard (IS)	Technical Specification (TS)	Publicly Avail Specification (PAS)	Technical Report (TR)
Document Type: Requirements?	Normative (i.e. contains reqts)	Normative	Normative	Informative (No requirements)
Consensus Level for Pub.	TC (+ input from all ISO MBs)	TC	WG	TC
Voting Requirements for Pub.	ISO MBs + 2/3 of TC P-members approval (<1/4 votes disapprove)	2/3 of P-members approval	Simple majority of P-members	Simple majority of P-members
Intended Use	Technologies that are sufficiently mature for a longer term standard	Less mature technologies/ methods, etc that are likely to change in the short term		TC wishes to publish collected relevant information (e.g., test results) and/or guidance
Systematic Review (SR) Cycle / Doc Lifetime	No life limit (SRs every 5 yrs or less)	SR after 3 yrs Recommended maximum life=6 yrs	SR after 3 yrs Max life = 6 yrs (convert or withdraw)	No life limit

Normative: necessary for application of standard / Informative: assist in particular subject area

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