第6回JMACシンポジウム
バイオ分野で進むISOとイノベーションの関係

バイオバンク分野における適合性評価
Conformity assessment in biobanking spectrum

◆2019年1月24日(木)10:00-14:10

場所：東京国際フォーラム　ホールB5（東京）

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Outline

1. バイオバンクにおける国際標準化:　ISO TC276
2. バイオバンクの観点からみたISO TC212の現状
3. Conformity Assessment
4. 標準化とInnovation
5. バイオバンクからみた，今後の社会のありかたを変えるかもしれない動き
6. 日本における挑戦

バイオバンクにおける国際標準化:
ISO TC276

TC276 *Biotechnology*: Scope

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

1. terms and definitions;
2. biobanks and bioresources;
3. analytical methods;
4. bioprocessing;
5. data processing including annotation, analysis, validation, comparability and integration

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/SC16.

History of TC276WG2

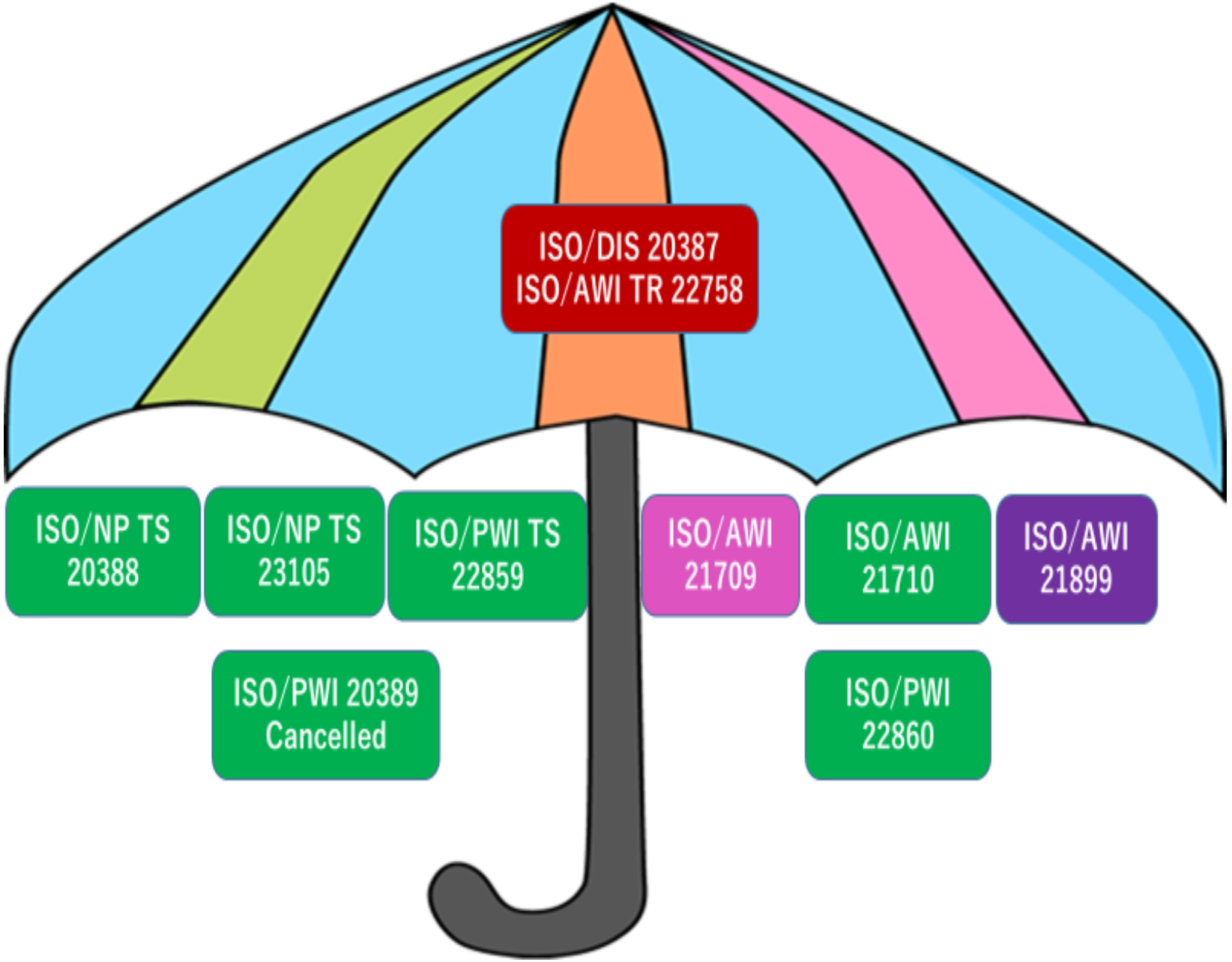
ISO/TC 276 1st TG2 meeting（2013.12. Berlin ）
ISO/TC 276 2nd TG2 meeting（2014.5.14～16. Berlin ）
ISO/TC 276 1st WG2 meeting（2014.12.8～11. Berlin）
ISO/TC 276 2nd WG2 meeting（2015.4.13～18. Shenzhen ）
ISO/TC 276 WG2 side meeting（2015.7.9. Paris ）
ISO/TC 276 3rd meeting（2015.10.28～29. Tsukiji, Tokyo ）
ISO/TC 276 WG2 side meeting（2016.1.18. Berlin ）
ISO/TC 276 WG2 side meeting（2016.4.7. Berlin ）
ISO/TC 276 4th meeting（2016.5.9～10. Washington, DC ）
ISO/TC 276 5th meeting（2016.10.24～25. Dublin）
ISO/TC 276 5.1th WG2 WebEx meeting（2016.11.24）
ISO/TC 276 5.2th WG2 WebEx meeting（2016.11.29）
ISO/TC 276 7th WG2 side meeting（2017.1.24～25. Berlin ）
ISO/TC 276 8th meeting（2017.5.8～10. Seoul）
ISO/TC 276 WG2 side meeting（2017.7.6～7. Berlin ）
ISO/TC 276 WG2 side meeting（2017.9.12 and 15 Stockholm）
ISO/TC 276 10th meeting（2017.11.27～29. Rome）
ISO/TC 276 WG2 side meeting（2018.1.23～25. Berlin ）
ISO/TC 276 11th meeting（2018.6. 11~13, Beijing）
ISO/TC 276 WG2 side meeting（2018.10.29～30. Berlin ）
ISO/TC 276 12th meeting（2018.12. 14~16, Potsdam）

ISO 20387:2018
Biotechnology -- Biobanking -- General requirements for biobanking

Standard and/or project under the direct responsibility of ISO/TC 276 Secretariat (16) Stage ICS
ISO/AWI TS 20388 [Under development]
Biotechnology -- Biobanking -- The Collection, processing, storage and transportation criteria for animal genetic resources
ISO/AWI 21709 [Under development]
Biotechnology -- Biobanking -- Process and quality requirements for establishment, maintenance and characterization of mammalian cell lines
ISO/WD 21710 [Under development]
Biotechnology -- Data management and publication in microbial biological resource centers
ISO/DIS 21899 [Under development]
Biotechnology -- Biobanking -- General requirements for the validation and verification of processing methods for biological material in biobanks
ISO/AWI TR 22758 [Under development]
Biotechnology -- Biobanking -- Implementation guide for ISO 20387
ISO/AWI TS 22859-1 [Under development]
Biotechnology -- General guidelines for biobanking human MSCs -- Part 1: Derived from umbilical cord
ISO/AWI TS 23105 [Under development]
Biotechnology -- Biobanking -- The collection, processing, storage and transportation technology criteria for plant genetic resources

Various proposals will be further developed after completion of **ISO/DIS 20387 and ISO/AWI TR 22758.**

These and other standards will address more specific requirements and will be aligned with the “parent” document and its implementation guide.



Legacy sample

7.8.1.2

The biobank shall provide biological material and associated data fit for purpose. The biobank shall define a minimum set of QC procedures to be performed on the biological material and associated data or a subset of it. Exceptions can be justified for rare or legacy biological material and associated data and QC procedures which lead to biological material elimination.

NOTE “Legacy biological material and associated data” refers to the biological material and associated data acquired or received by the biobank before the biobank has implemented this document.

Legacy Collections

- Existing biobanks have a lot of legacy collections. Huge investments had been poured into those collections.

- Biobanks have serious concerns that the standards/specifications to be drafted in WG2 would discourage or virtually ban the use of such collections which have been collected before the standard is published.

- Japan would like to request WG2 to address the concerns so as to avoid the loss of the investment over the decades, when WG2 set new standards/specification.

Timestamp

A.2 Acquisition

In the context of the acquisition of biological material (meaning the collection or sampling of the biological material in its habitat such as e.g. in nature, in a human or animal host organism) and associated data, documentation of the following is required:

a) **timestamp**, i.e. date and, when appropriate, time in a standard format preferably according to ISO 8601 (see Note to 7.1.3);

B.2 Acquisition

Requirement from Annex A	**Documentation examples**
Timestamp	
collection time and/or date in a standard format preferably according to ISO 8601 (see Note to 7.1.3)	

B.4 Preparation/preservation

Requirement from Annex A	**Documentation examples**
preparation method	preservation method
recording of **timestamps**	

B.6 Storage

Requirement from Annex A	**Documentation examples**
long-/short-term storage conditions	type of storage, freezer or cold room
	temperature
	timestamp

8.5 Actions to address risks and opportunities (Option A)

It is up to the biobank to determine how to identify risks and opportunities.
One possible approach is the use of **risk-based thinking.**

Internal:
From a biobank's internal perspective, a risk-based approach might direct the allocation of limited resources such as personnel and funds according to the magnitude of the risk and/or opportunity.
This approach can contribute to minimizing the risk of interference with critical biobank activities.
These concepts can be further explored in ISO 9001:2015 and ISO 35001.

External:
In addition, external risks and opportunities might also be identified and addressed by similar or alternative approaches.

Internal audit

6.4.1.5 The biobank shall determine the verification, or other activities, necessary to ensure that the externally provided processes, products and services meet the biobank's requirements.

Additions to 6.4.1.5

Verification of compliance may be performed by the external provider according to agreed-upon processes and/or by the biobank based on pre-determined quality control measures, within an appropriate timeframe after receipt. This could include the monitoring of external providers by reviewing their internal audits (first party audits) or by auditing by the biobank (second party audits).

6.4.1.6 When the biobank decides to use externally provided preservation, storing and/or authentication activities, it shall ensure that:

1. a) the process and all the interrelated processes are validated according to the provisions of this document;
2. b) internal audits of these processes are planned by the external provider and performed regularly using a risk-based approach (see also ISO 19011);
3. c) relevant documented information related to these activities is retained.

Additions to 6.4.1.6

For externally provided preservation, storing and authentication services, the validation refers to ISO 20387, 7.9.2.

バイオバンクの観点からみたISO TC212の現状

TC212 *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:

1. Quality and competence in the medical laboratory
2. Reference systems
3. In vitro diagnostic products
4. Microbiology and molecular diagnostics
5. Laboratory biorisk management

ISO TC212Clinical laboratory testing and in vitro diagnostic test systems #1

- ISO/TS 20658:2017, Medical laboratories – Requirements for collection, transport, receipt and handling of samples.
- ISO 15190, Medical laboratories –-- Requirements for safety.
- ISO 22367, Medical laboratories – Application of risk management to medical laboratories.
- ISO/DTS 22583, Guidance for supervisors and operators of point-of-care testing (POCT).
- ISO/DTS 20914, Medical laboratories – Practical guide for the estimation of measurement uncertainty.
- AWI 23162, Basic semen analysis – Specification and test methods.
- PWI Medical laboratories – Guidance on application of ISO15189:2012 to emerging technologies.
- PWI Medical laboratories – Guidance for application of ISO 15189 to anatomic pathology.
- ISO 15189, Medical laboratories – Requirements for quality and competence

ISO TC212Clinical laboratory testing and in vitro diagnostic test systems #2

- ISO/DIS 20916, In vitro diagnostic medical devices -- Clinical performance studies using specimens from human subjects -- Good study practice.
- ISO 17593, Requirements for in vitro monitoring systems for self-testing of oral anticoagulant therapy.
- ISO 18113 Parts 1 – 5, In vitro diagnostic medical
- ISO 15197: 2013, In vitro diagnostic test systems -- Requirements for blood-glucose monitoring systems for self-testing in managing diabetes mellitus.
- ISO/TS 17518:2015, Medical laboratories -- Reagents for staining biological material -- Guidance for users.
- ISO 20166-1: FFPE tissue – Part 1: Isolated RNA
- ISO 20166-2: FFPE tissue – Part 2: Isolated proteins
- ISO 20166-3: FFPE tissue – Part 3: Isolated DNA
- NP 20166-4, Specifications for pre-examination processes for formalin-fixed and paraffin-embedded (FFPE) tissue for in situ detection techniques.

ISO TC212Clinical laboratory testing and in vitro diagnostic test systems #2

- ISO 20186-1: Blood – Part 1: Isolated cellular RNA
- ISO 20186-2: Blood – Part 2: Isolated genomic DNA
- ISO 20186-3: Blood – Part 3: Isolated ccfDNA from plasma
- PWI for 20776-3 Disc Diffusion reference method for testing the in vitro activity of antimicrobial agents against rapidly growing aerobic bacteria involved in infectious diseases
- ISO 16256, Reference method for testing the in vitro activity of antimicrobial agents against yeast fungi involved in infectious
- The ISO 35001 Biorisk management for laboratories and other related organisations
- PWI 16335:2011, Biosafety professional competence

DRAFT INTERNATIONAL STANDARD

ISO/DIS 20186-3

ISO/TC **212**

Secretariat: **ANSI**

Voting begins on:
2018-01-03

Voting terminates on:
2018-03-28

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

Part 3:
Isolated circulating cell free DNA from plasma

Tests de diagnostic moléculaire in vitro - Spécifications relatives aux processus pré-analytiques pour le sang - ARN cellulaire —

Partie 3: ADN libre circulant extrait du plasma

1 Scope

This document recommends the handling, storage, processing and documentation of venous whole blood specimens intended for circulating cell free DNA (ccfDNA) examination during the pre-examination phase before a molecular assay is performed. This document covers specimens collected in venous whole blood collection tubes.

This document is applicable to any molecular *in vitro* diagnostic examination performed by medical laboratories. It is also intended to be used by laboratory customers, *in vitro* diagnostics developers and manufacturers, biobanks, institutions and commercial organizations performing biomedical research, and regulatory authorities.

Different dedicated measures need to be taken for stabilizing blood genomic DNA, which are not described in this document. Blood genomic DNA is covered in ISO 20186-2, *Molecular in vitro diagnostic examinations — specifications for pre-examination processes for venous whole blood — Part 2: Isolated genomic DNA*.

Different dedicated measures need to be taken for preserving DNA in circulating exosomes, which are not described in this document.

NOTE 1 CcfDNA obtained from blood by the procedures suggested in this document can contain DNA present in exosomes[8][9].

DNA in pathogens present in blood is not covered by this document.

NOTE 2 International, national or regional regulations or requirements can also apply to specific topics covered in this document.

Conformity Assessment

Conformity Assessment

Conformity Assessment

Vehicle for both verifying and communicating demonstrated competence and compliance with standards or best practices

Evidence or Attestation

3rd Party: Accreditation

Certificate

2nd Party: Agreement

Contract

1st Party: Self-declaration

Assertion

総　　説

臨床検査室とISO：バイオバンク分野を例として

古　田　　耕*

Medical Laboratories and ISO: Special Reference to Biobanking

Koh FURITA, MD, PhD*

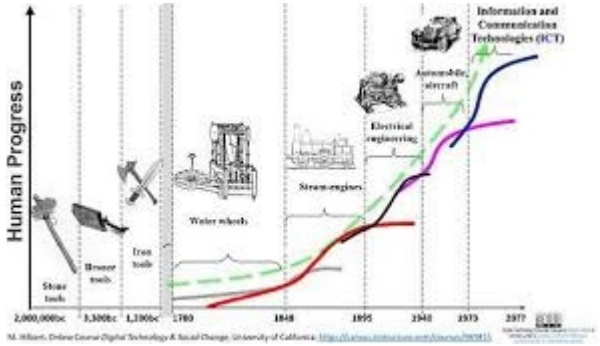
Historically medical laboratories are focusing on their resources to serve for providing better patient care special reference to samples and associated data. ISO 15189 supports these attempts. Recently "biobanking" is becoming a hot topic outside the laboratory medicine community. ISO 20387 was published in August, 2018. ISO 20387 is prepared for the purpose of providing "General requirements for biobanking". Part of this ISO norm is focusing on human samples and associated data. As workers in medical laboratories, it is preferable to understand this ISO norm addition to ISO 15189. This article is trying to provide a few important points of ISO 20387. Further, additional information regarding "conformity assessment" and "other guidance documents" provided.【Review】

[Rinsho Byori 66：000～000, 2018]

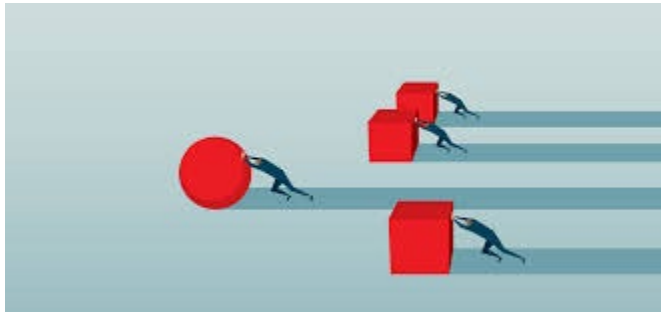
標準化とInnovation

Standardization could be a cradle for innovation.

- Some have criticized that **standardization** prevents the progress of technologies.



- However, in occasions where the direction of **standardization** was properly placed, **standardization** have had positive impacts on **innovation**.



All standards are not the same.

- It is much preferred to express a standard's requirements with references to performance, rather than to specific device features. This approach fosters innovation and healthy marketplace dynamics.

- Design requirements:

The table shall have four wooden legs.

- Performance requirements :

The table shall be constructed such that the table top remains level and at its original height when subjected to … .

Source: International Medical Device Regulators Forum (IMDRF) document

バイオバンクからみた，
今後の社会のありかたを
変えるかもしれない動き

History of ISBER Best Practices

ISBER was Founded In 1999 with a Key Objective to Develop Harmonized Principles in the Science and Management of Repositories.

1st Edition, 2005

- Addressed Only Human Specimens, U.S.-centric.

2nd Edition, 2008

- Revised to Include Environmental Repositories and International Perspective.

3rd Edition, 2012

- Expanded to Include Cost Management and Specimen Access, Utilization, and Destruction.

4th Edition, 2018

- Updated to Reflect Advances in Biospecimen Science, New Technologies, and Quality Management Systems.

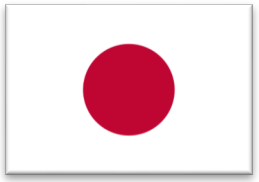
BEST PRACTICES:
Recommendations for Repositories
Fourth Edition

isber
INTERNATIONAL SOCIETY FOR BIOLOGICAL AND ENVIRONMENTAL REPOSITORIES

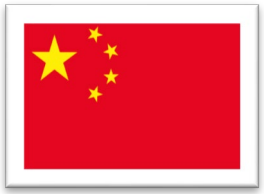
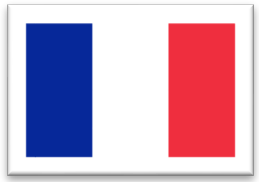
These Best Practices are reviewed periodically and revised to incorporate improved application and research findings that would affect repository work. The reader is advised to check the ISBER web site (www.isber.org) to ensure that the most recent version is available for use.

Translations

- Some Translations Already Available.
- Go to the Best Practices Webpage (isber.org/bestpractices) to Sign up to Receive Notifications as to when Translations will be Available.
- Announcements on Social Media.
- More Translations to Follow.


3rd edition



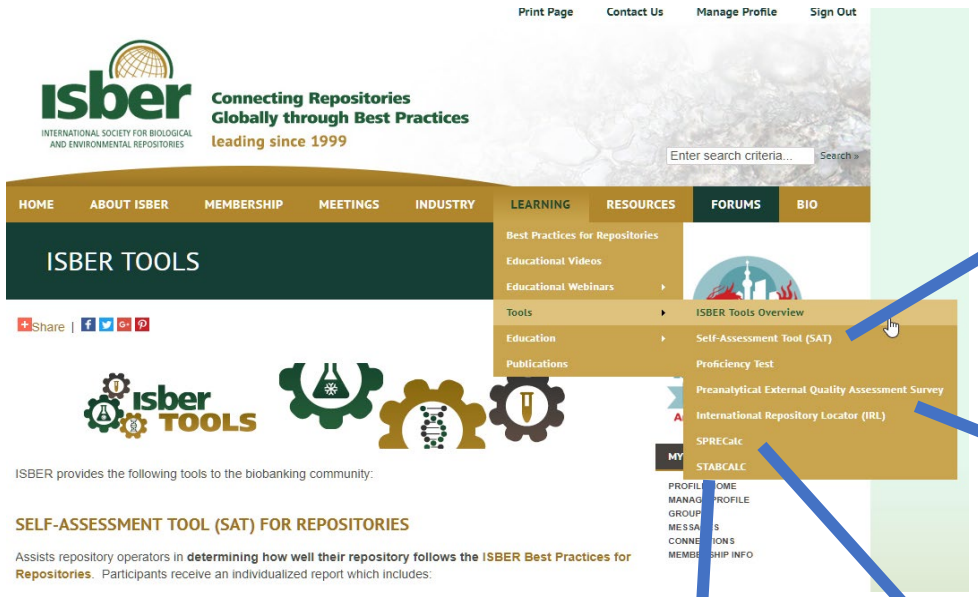

4th edition

Country	Count
United States	721
Canada	91
Brazil	21
Mexico	8
Chile	5
Argentina	4
Ecuador	2
Puerto Rico	2
Uruguay	2
Colombia	1
Costa Rica	1
Jamaica	1
Total	**859**

Country	Count
Japan	90
Australia	67
India	22
Korea, South	19
Philippines	17
Singapore	15
Austria	9
Malaysia	9
New Zealand	4
Indonesia	3
Guam	2
Thailand	2
Vietnam	2
Taiwan	1
Total	**262**

Country	Count
United Kingdom	55
Germany	44
France	41
Switzerland	36
Italy	27
Russia	27
Spain	25
Belgium	21
Netherlands	18
Turkey	17
South Africa	15
Denmark	13
Ireland	11
Norway	11
Egypt	10
Iran	8
Portugal	7
Sweden	7
Uganda	7
Finland	6
Nigeria	5
Poland	5
Saudi Arabia	4
Ukraine	4
Czech Republic	3
Kenya	3
Hungary	2
Romania	2
Zimbabwe	2
Austria	1
Georgia	1
Greece	1
Iceland	1
Israel	1
Kazakhstan	1
Lithuania	1
Luxembourg	1
Qatar	1
Scotland	1
Slovenia	1
U.A.E.	1
Zambia	1
Total	**449**

ISBER Tools



Identify areas that need improvement!

The ISBER **Self-Assessment Tool** (SAT) hosted by IMS assists repository operators in determining how well their repository follows the ***ISBER Best Practices for Repositories***.The assessment is confidential and aimed at helping specimen collection centers strengthen their practices through the identification of areas in need of improvement.

PRE-ANALYTICAL BIOREPOSITORY EXTERNAL QUALITY ASSESSMENT (EQA) SURVEY

Allows participants to **benchmark their pre-analytical practices to other biorepositories**. Participants receive and individualized report which includes the results and statistics obtained by all biorepositories who have participated.

STANDARD PRE-ANALYTICAL CODE (SPREC)

Identifies and records the main pre-analytical factors that may have impact on the integrity of sampled clinical fluids and solid biospecimens and their simple derivatives during collection, processing and storage.

BIOSPECIMEN STABILITY TESTING CALCULATOR (STABCALC)

Determines sample stability, including freeze-thaw stability and storage stability. STABCALC facilitates stability studies performed by biobanks on different types of biospecimens by identifying potential variabilities in pre-analytical procedures.

ISBER Best Practice: Education Cell therapy

Repository Qualification Credential

- ISBER, the leading international repository society, and ASCP BOC (American Society for Clinical Pathology Board of Certification) an organization providing excellence in global medical laboratory professional certification are establishing a shared qualification category through which individuals may earn a Repository Qualification Credential.

ISBER and IARC Sign Memorandum of Agreement

Share Article

The International Society for Biological and Environmental Repositories (ISBER) is pleased to announce the signature of a Memorandum of Agreement with the International Agency for Research on Cancer (IARC), the specialized cancer agency of the World Health Organization (WHO).

VANCOUVER, CANADA (PRWEB) OCTOBER 29, 2018

日本における挑戦

CIBER
Council for Industrial use of Biological and Environmental Repositories

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https://ciber.or.jp/

MMCRIとは

県医療施設バイオバンク連絡会
Municipal Medical Center Research Infrastructure(MMCRI)

連絡会の趣旨：
三大メガバンクを中心に、その整備と試料収集が始まっている。一方、県などの自治体が運営する公的医療機関においても、バイオバンク整備と試料収集が始まっている。これからは、収集された試料と附随するデータを利活用するフェーズを迎える。中規模バンクにおいては、その規模感、予算手当など共通課題があり、相互に連携することで、SOPやデータベース等のリソースを共有し、それぞれの特色を生かした小回りのきくバイオバンク運営が期待できると考え、連絡会を設けて活動している。

参加施設：（2019年1月現在）
神奈川県立がんセンター
独立行政法人　佐賀県医療センター　好生館
愛知県がんセンター
千葉県がんセンター
世話役：CIBER事務局/JMAC事務局

The International Society for Biological and Environmental Repositories Supports the Council of Industrial Use of Biological and Environmental Repositories in Japan

The International Society for Biological and Environmental Repositories (ISBER) is pleased to release a statement of support for the creation of the Council of Industrial Use of Biological and Environmental Repositories (CIBER) in Japan.

VANCOUVER, B.C. (PRWEB) APRIL 03, 2018