SOP
FOR QUALITY CONTROL STRATEGY IMPLEMENTATION

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SWISS BIOBANKING PLATFORM

A. GENERAL INFORMATION

A0. DISCLAIMER

The SBP SOPs are based on Good Biobanking Practices[1] and should serve as a reference guidance for biobanks to develop site-specific Work Instructions. It is the biobank responsibility to adapt this document to reflect its own practice and highlight the biobank relevant specificities.

A1. SCOPE

In particular, this document provides a guidance on the developments to be implemented by the biobank to assess the quality of its biological material and related activities. This strategy focuses on measuring the performance of the operational processes related to the objectives described in the Quality Manual. Based on these objectives, measures are proposed to monitor process and sample quality.

- Process quality is evaluated based on specific quality indicators corresponding to the critical aspects of each biobanking process. These quality indicators should be defined and specific measurements (i.e. In-process and Post-process Quality Controls) with pre-defined criteria should be proposed to monitor them. Additionally, external Process Quality Control could be implemented by the biobank through Proficiency testing, or peer-reviewed Quality Controls.
- Functional Sample quality is evaluated when applicable related to a known downstream analysis and application.

Importantly, this document does not focus on data quality control, even if some aspects are mentioned when they are inextricably linked to the presented concepts.

A2. OBJECTIVES

- Determine the procedure for internal Process QC by setting up Process Quality Indicators and their monitoring.
- Determine the procedure for external Process QC (Proficiency testing or peer-reviewed QC), if applicable.
- Determine the procedure for functional Sample QC, if applicable.
- Ensure that every QC result has been documented appropriately.
- Ensure that QCs serve as a basis for implementation of corrective measures and continuous quality improvement (see SBP SOP 1.04.003 Improvement Management).
- Ensure that the Quality Policy defined in the Quality Manual is updated according to QC results and that the quality objectives are met (see SBP SOP 1.04.003 Improvement Management).

A3. ABBREVIATIONS AND DEFINITIONS

For this document, the following abbreviations apply.

BIMS = Biobank Information Management System
HIL = Hemolysis, Icterus and Lipemia
NC = Non-conformity
QMS = Quality Management System
QC = Quality Control
QI = Quality Indicator
QR = Quality Representative
SBP = Swiss Biobanking Platform
SOP = Standard Operating Procedure

For this document, the following definitions apply.

Data verification process: procedure that shall be carried out periodically to confirm the integrity of the associated data (See SOP 1.02.003 Data and Sample Traceability).

Quality Indicator: feature indicating the extend to which the biobanked samples meet the needs and the expectations as defined in the quality objectives.

Quality Control: operational techniques or activities used to verify quality requirements. Quality Controls are derived from Quality Indicators.

[1] References for Good Biobanking Practices are the professional standards described in the document "Ethical, legal and professional compliance list for human research biobanks applicable in Switzerland", available on SBP website (www.swissbiobanking.ch).

Internal Quality Control: Routine QC that are performed by the biobank itself.

External Quality Control: QC performed by an external entity, such as proficiency or peer-reviewed testing.

Functional Sample Quality Control: Quality check focusing on the sample and related to its end-use function, as an application-specific analysis.

In-process Quality Control: Internal QC that are performed during the activities.

Monitoring: Follow up of a quality indicator over time.

Post-process Quality Control: Monitoring and analysis of the Internal QC performed after the activities at a defined frequency.

Process Quality Control: Monitoring focusing on the biobanking processes, to verity their reliability and reduce biobank-dependent bias. Process quality is evaluated indirectly with QC related to participant (e.g: consent documentation), the environment (e.g: equipment maintenance) and the samples (e.g: volume, concentration).

Proficiency testing: Evaluation by an external entity of the performance of an individual biobank regarding its processes, based on pre-defined criteria. It involves comparison with other similar biobanks all over the world.

Peer-reviewed testing: Comparison between several partner biobanks of the process efficiency obtained on the same reference samples in accordance with pre-defined criteria.

Sample verification process: Procedure that shall be carried out periodically to confirm that the appropriate biological material is in the correct location as indicated by the BIMS (See SOP 1.02.003 Data and Sample Traceability).

See SBP Glossary for other definitions.

B. PERSONNEL MANAGEMENT

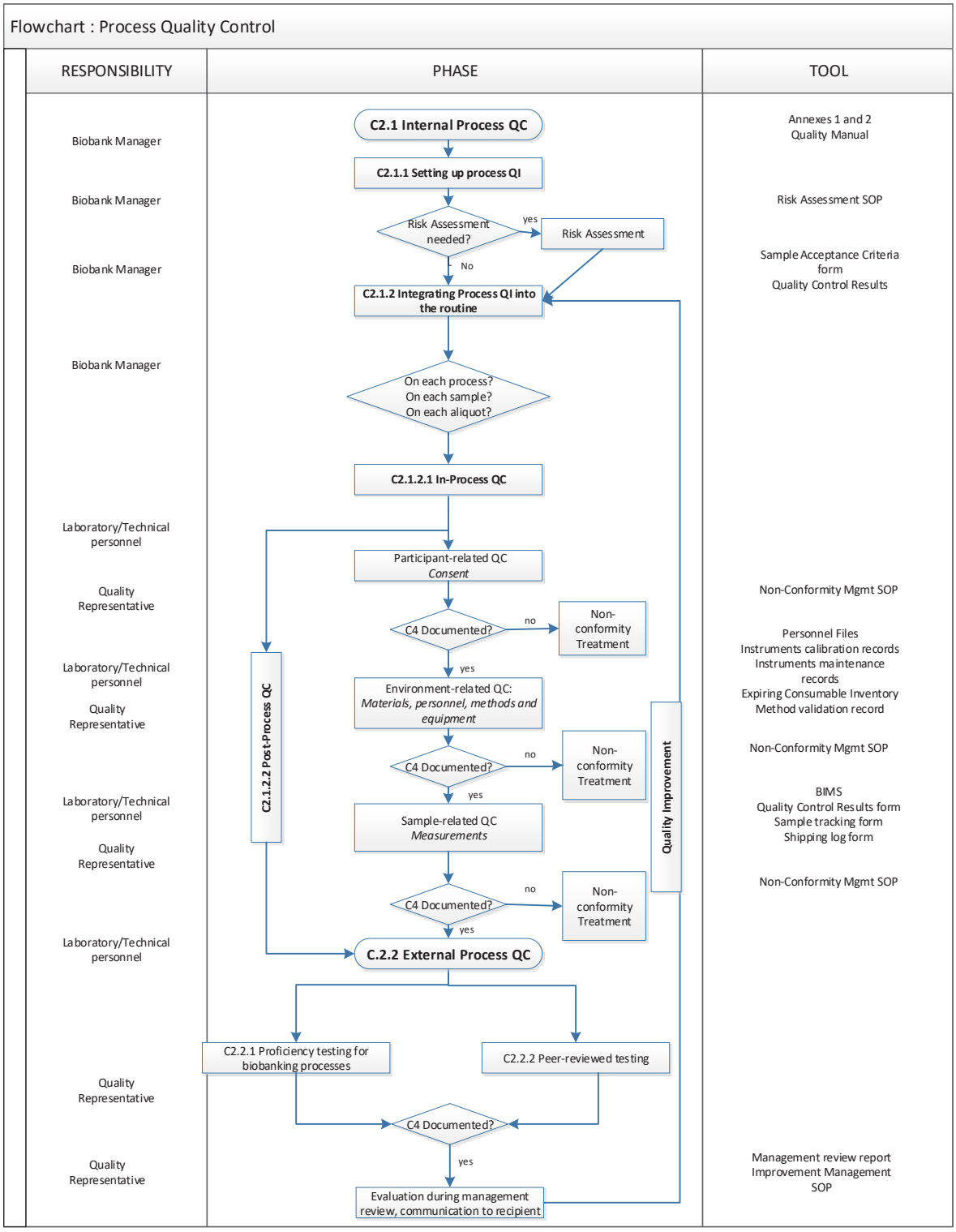
B1. ROLES AND RESPONSIBILITIES

BB personnel	Responsibility / role[2]
Biobank Director / Manager	› Appoint an expert team to set up Process QI and the corresponding in-process and post-process QC measures depending on the biobank specific processes. › Set up functional Sample QC if applicable.
Qualified laboratory Personnel	› Perform and document the in-process QC. › Perform and document the functional Sample QC, if applicable. › Perform and document the sample verification process. › Organize external QC if applicable (e.g. proficiency or peer-reviewed testing).
Quality Representative	› Performs and documents the post-process QC. › Oversees eventual corrective actions related to QC results. › Integrates QC results in the quality improvement strategy and in the management review. › Updates Quality Policy and the Quality Manual when needed.
BIMS admin	› Performs and documents the data verification process.

[2] This list is not exhaustive and should be adapted depending on the biobank strategy and available resources.

C. PROCESS MANAGEMENT

C1. FLOWCHART[3]



[3] For more clarity, functional sample Quality Control (if applicable) is not included in the flowchart, but should undergo a similar flow.

C2. PROCESS QUALITY CONTROL

A use case for DNA processing has been developed to provide examples of Quality Controls across the entire biobanking processes (see annex 1).

C2.1 Internal Process QC

C2.1.1 Setting-up Process Quality Indicators

Based on the quality objectives defined in the Quality Manual, the biobank must define Quality Indicators (QI) that adequately represent the critical processes steps which should be monitored and controlled. To that end, an expert team should be appointed including all the biobanking processes stakeholders (biobank manager, laboratory technicians, nurses, IT technicians, etc.) to brainstorm the preanalytical workflow. Using a fishbone diagram (see annex 2) can be helpful to list all the factors that can contribute to impact the sample quality[4]. Based on these factors, the primary causes of defects could be inferred and linked to measurable Quality Indicators. If too many factors are listed, a risk analysis should also be conducted to prioritize the most critical parameters to monitor.

C2.1.2 Integrating Process QI into the routine

To introduce Quality Indicators in the routine operations of the biobank, two different approaches could be developed. First, some measures should be executed and documented during the execution of the processes. This kind of QC is called “In-process” in the next chapters, and is detailed in chapter C2.1.2.1. Then, a monitoring of the results obtained during the in-process QC should be performed to have a global overview of the process quality and to allow quality improvement. This kind of QC is called “Post-process” in the next chapters, and is detailed in Chapter C2.1.2.2. When applicable, Quality Indicators should be monitored for each process individually, and on each sample and aliquots. Quality Indicators and the expected results for In-Process QC should be integrated in the BIMS (e.g.: automatic recordings[5]) and/or in the Sample acceptance criteria form (see SBP form 2.03.003 Sample Acceptance Criteria).

C2.1.2.1 In-process QC

Examples of common Quality Indicators and related in-process QC based on the literature[6] are listed in the table below, for each process. In this document, for practical reason, we chose to classify Quality Indicators into three categories: participant-related (including consent), environment-related (including materials, personnel, methods and equipment) and sample-related[7] (including measurements), as information to gather in these categories are sequential, and facilitate the operational management. The list is not exhaustive and should be modified or completed depending on the specific biobanking field. Importantly, in-process QC should be linked to SBP datasets[8].

Participant-related QC		
Quality indicator	**In-process QC**	**Hints / Examples**
Consent form	Present?	record
Decision documentation	Current status?	consent withdrawal status

4 References in Ch. E3: [4], [2].

5 Automatic recordings should always be preferred to manual recordings approach since it dramatically decreases data entry errors and thus have a clear impact on data quality.

6 References in Ch. E3: [1], [6], [7], [5] and [3].

7 This category should not be confused with functional sample QC. Here these are process QC that are performed on each sample to evaluate process quality (e.g: sample volume is an indicator of process and not sample quality).

8 Available on:
https://swissbiobanking.ch/tissue-and-liquid-data-sets/
https://swissbiobanking.ch/dataset-bacteria/

Environment-related QC		
Method validation and instruments qualification	Current status?	Collection: Impact of collection conditions on sample integrity?
		Transport: Impact of transport conditions on sample integrity?
		Processing: Impact of centrifugation conditions on sample integrity? Adequate aliquoting by a robot verified?
		Storage: Impact of storage conditions on sample integrity?
		Distribution: Distribution conditions impact on samples integrity?
Instruments maintenance	Current status?	Collection: scanning tool, short-term storage fridge
		Transport: Data logger for temperature
		Reception: scanning tool, short-term storage fridge
		Processing: pipets, robots, scanning tool, centrifuges, short-term storage freezers
		Storage: long-term storage freezers
		Distribution: Data logger for temperature
Instruments calibration	Current status?	Collection: short-term storage fridge
		Transport: Data logger for temperature
		Reception: short-term fridge
		Processing: pipets, robots, centrifuges, short-term storage freezers
		Storage: long-term storage freezers
		Distribution: Data logger for temperature
Instruments monitoring	Parameter recorded?	Collection: short-term fridge temperature
		Transport: coolbox temperature
		Reception: short-term fridge temperature
		Processing: short-term storage freezer temperature
		Storage: long-term storage freezer temperature
		Distribution: coolbox temperature
Material qualification	Expiration date?	Laboratory reagents and consumables
Instrument cleaning	Current status?	Transport: coolbox cleaning
		Reception: coolbox cleaning
		Processing: pipets, robots, centrifuge cleaning
		Storage: long-term storage freezers cleaning and defrosting
Identification of the fridges and freezers and shelf, rack, box	Current status?	Inventory or Tags
Staff training	Current status?	Monitoring of training
Service Level Agreement for outsourced activity	Current status?	Presence of this document
Material Transfer Agreement	Current status?	Distribution: Presence of this document

Sample-related QC		
Quality indicator	**In-process QC**	**Hints / Examples**
Identification	Misidentification error?	Specimen type
Sample primary container	Wrong or inappropriate?	Sample container
Long-term storage container	Wrong or inappropriate?	Sample container
Processes timings	Exact timings?	Collection: Duration of blood draw, Process beginning time and end, Time To Processing, Time to Freeze
		Transport: Process beginning time and end, Time To Processing, Time to Freeze
		Reception: Process beginning time and end, Time To Processing, Time to Freeze
		Processing: Process beginning time and end, Time to fixation, Cold ischemia time, warm ischemia time
		Storage: Process beginning time and end, Time to Freeze
		Distribution: Process beginning time and end
Sample appearance	As expected?	For blood: HIL index / coagulation
Temperature	Temperature recorded?	Collection: Pre-processing temperature, short-term storage temperature
		Transport: Transport temperature
		Reception: Short-term storage temperature
		Processing: Processing temperature, short-term storage
		Storage: Long-term storage temperature
		Distribution: Distribution temperature
Sample Volume	Exact?	Volume
Condition of centrifugation	Current status?	Processing: force, duration, temperature, brake
Sample type	Wrong or inappropriate sample matrix?	For blood: whole blood instead of plasma

C2.1.2.2 Post-Process QC

Additionally, post-process QC should be derived from in-process QC. Examples based on the literature[9] are listed in the table below. The list provided is not exhaustive and should be modified or completed depending on the specific biobanking field. Post-process QC should be performed at a pre-defined frequency to monitor the Quality Indicators and have a global trend overview.
Measurements should be made based on any documented information.

For example:

- in the BIMS
- on the reported QC results (Form 2.04.009 “Quality Control Results”).
- on the reported non-conformities (Form 2.04.007 “Non-Conformity Report”)
- in the sample tracking or shipping log forms (see SBP forms 2.03.001 “Sample tracking form” and 2.03.003 “Shipping log”)
- in instruments logbooks and Expiring Consumable Inventory (see SBP forms 2.02.002 “Equipment calibration records”, 2.02.003 *Equipment maintenance records” and 2.02.005 “Expiring Consumables Inventory”).
- in Personnel files (see SBP form 2.02.001 “Personnel file”)
- in Participant identification log (see SBP form 2.02.006 “Participant Identification log”)
- in Method validation records (see SBP form 2.03.004 “Method validation record”)

Note that sample and data verification should be performed at a defined frequency (see SBP SOP 1.02.003 “Data and Sample Traceability”).

[9] References in Ch. E2: [7] and [3].

The results obtained during post-process QC should be documented and evaluated during the management review (see form "2.04.005 Management review report").

Quality indicator	Post-process QC (examples)
Identification (Specimen type)	Number of samples with a misidentification error / total number of samples
Sample type	Number of samples of wrong or inappropriate sample matrix (e.g. whole blood instead of plasma) / total number of samples
Sample tube (primary container, aliquots and long-term storage tubes)	Number of samples of wrong or inappropriate sample tube / total number of samples
Process timings	Timings trends
Sample appearance (HIL index / coagulation)	Number of haemolyzed samples / total number of checked samples for hemolysis; Number of icteric samples / total number of checked samples for icterus Number of lipemic samples / total number of checked samples for lipemia Number of samples clotted / total number of samples with an anticoagulant checked for clots
Temperature (Pre-processing temperature, short-term and long-term storage)	Temperature trends
Sample Volume	Number of samples with incorrect sample volume / total number of samples
Sample damage	Number of samples damaged / total number of samples
Sample missing	Number of samples not received / total number of samples
Sample location and traceability	Number of samples not correctly located / Number of samples checked during sample verification process
Data quality	Number of samples with error in data entry / Number of samples checked during data verification process
Staff performance	Number of detected errors by employee as a function of time
Recruitment performance	Number of recruited participants as a function of time

C2.2 External Process QC

In addition to internal QC, biobanks should develop a strategy to evaluate their process quality compared to other similar biobanks.

This is recommended to every biobank, but particularly for the ones participating to multicentre studies or willing to be accredited to ISO standard (ISO 20387). To that end, two different options could be developed: participating to external proficiency testing or organizing peer-reviewed testing with partner biobanks. Both options involve comparison of process quality to external biobanks, used as referential. In any case, external process QC requires to have an insight into the downstream application, to choose the analytical method for comparison.

Importantly, for any external QC, a reference material is used, and is the basis for the comparison. Biobank should guarantee that no bias is introduced in the procedure before comparison analysis. Specifically concerning transport of the reference material between biobanks or testing entities, critical parameters (temperature, time) should be previously discussed between the different stakeholders and acceptable values should be predefined.

C2.2.1 Proficiency testing for biobanking processes

Proficiency testing is the biobank performance evaluation by an external entity (organizer) regarding its samples or processes, based on pre-defined criteria. It involves comparison with other similar biobanks all over the world. The basic principle is that the biobank receives from the organizer a reference sample to process, and send it back to the organizer. The reference sample is analyzed by the organizer and the results are compared with other similar biobanks, according to pre-defined criteria. At the end, the biobank receives a

report indicating results of the benchmarking. When this approach is chosen, proficiency testing should be performed at a pre-defined frequency, to monitor the evolution of the practices.

C2.2.2 Peer-reviewed testing

Peer-reviewed testing is a comparison between several partner biobanks of the process efficiency obtained on the same reference sample, in accordance with pre-defined criteria. It is particularly recommended when several biobanks would like to share samples in the frame of a specific project. It involves getting one adequate reference sample to share between the different partners, as a certified standard, or as a pool of additional samples, specifically dedicated to quality purpose. This reference sample should be processed by all the partner biobanks, to ensure reliability and efficiency of the biobanking processes. A reference laboratory should be chosen for the reference sample analysis, depending on pre-defined criteria. At the end, a comparative analysis should be performed, with adequate statistical analysis. When this approach is chosen, peer-reviewed testing should be performed at a pre-defined frequency, to monitor the evolution of the practices.

C3. FUNCTIONAL SAMPLE QUALITY CONTROL

When the exact application for downstream analysis is known for the biobanked samples, quality attributes should be inferred from this specific purpose to check for the sample quality individually. This aspect is particularly important for biobanks that have no or a lack of control of the pre-analytical aspects related to sample collection and processing, but know the intended purpose. QC should be specifically oriented to monitor these quality attributes and guarantee that the biobanked samples are fit-for-purpose. Parameters should be determined depending on the specific use and documented in the BIMS or in the Sample Acceptance criteria form (see SBP form 2.03.003 “Sample Acceptance Criteria”).

C4 . QC DOCUMENTATON

Results obtained for internal QC should be registered directly in the BIMS, or documented in the Quality Control Results form (see SBP form 2.04.009 Quality Control Results).
Summary of the external process QC should be documented with the corresponding results.
All the QC results should be gathered in reports and evaluated during the management review (see form 2.04.005 “Management review report”) to serve as a basis for quality improvement process (see SBP SOP 1.04.003 “Improvement Management”), including corrective actions.

C5. QC COMMUNICATION

Results obtained for internal and external QC should be communicated to recipient user when applicable. For critical material (e.g.: cells), a Certificate of Analysis listing the details of the performed QC on the sample could be prepared.

C6. QUALITY CONTROL

NA

D. RESOURCE MANAGEMENT

D1. MATERIALS AND EQUIPMENT

NA

D2. POTENTIAL HAZARDS AND PRECAUTIONS TO TAKE

NA

D3. PROTECTIVE WEAR AND SAFETY EQUIPMENT

NA

E. REFERENCES

E1. REFERENCE TO OTHER SBP DOCUMENTS

Please find refer to the following documents that are relevant to this WI[10].

- SBP Datasets
- 1.04.002 Non-Conformity Management SOP
- 1.04.003 Improvement Management SOP
- 2.04.007 Non-Conformity Report Form
- 2.04.009 Quality Control Results
- 1.02.003 “Data and Sample Traceability”
- 2.02.002 “Equipment calibration records”
- 2.02.003 “Equipment maintenance records”
- 2.03.001 “Sample tracking form”
- 2.03.003 “Shipping log”
- 2.02.001 “Personnel file”
- 2.02.006 “Participant Identification log”)
- 2.02.005 “Expiring Consumables Inventory”
- 2.03.004 “Method validation record”
- 2.03.003 “Sample Acceptance Criteria”
- 2.04.005 “Management review report”

E2. SCIENTIFIC REFERENCES

[1] Campbell LD, Astrin JJ, DeSouza Y, Giri, J, Patel AA, Rawley-Payne M, Rush A and Sieffert N. The 2018 Revision of the ISBER Best Practices: Summary of Changes and the Editorial Team’s Development Process. Biopreservation and Biobanking 16(1): 3-6.

[2] Dollé, L., Bekaert, S., High-Quality Biobanks: Pivotal Assets for Reproducibility of OMICS-Data in Biomedical Translational Research. Proteomics 2019, 19, 1800485.

[3] Esteva-Socias, M., Artiga, M., Bahamonde, O. et al. In search of an evidence-based strategy for quality assessment of human tissue samples: report of the tissue Biospecimen Research Working Group of the Spanish Biobank Network. J Transl Med 17, 370 (2019). https://doi.org/10.1186/s12967-019-2124-8

[4] Flegar-Meštrić, Z., Perkov, S., Radeljak, A., Kardum Paro, M., Prkačin, I., & Devčić-Jeras, A. (2017). Risk analysis of the preanalytical process based on quality indicators data, *Clinical Chemistry and Laboratory Medicine (CCLM)*, 55(3), 368-377. doi: https://doi.org/10.1515/cclm-2016-0235

[5] Charlotte Gils, Mads Nybo, Quality Control of Preanalytical Handling of Blood Samples for Future Research: A National Survey, *The Journal of Applied Laboratory Medicine*, Volume 5, Issue 1, January 2020, Pages 83–90, https://doi.org/10.1373/jalm.2019.029942

[6] Lippi, G., Betsou, F., Cadamuro, J., Cornes, M., Fleischhacker, M., Fruekilde, P., Neumaier, M., Nybo, M., Padoan, A., Plebani, M., Sciacovelli, L., Vermeersch, P., von Meyer, A., Simundic, A., & on behalf of the Working Group for Preanalytical Phase (WG-PRE), European Federation of Clinical Chemistry and Laboratory Medicine (EFLM). (2019). Preanalytical challenges – time for solutions, *Clinical Chemistry and Laboratory Medicine (CCLM)*, 57(7), 974-981. doi: https://doi.org/10.1515/cclm-2018-1334

[7] Sciacovelli, L., Panteghini, M., Lippi, G., Sumarac, Z., Cadamuro, J., Galoro, C., Pino Castro, I., Shcolnik, W., & Plebani, M. (2017). Defining a roadmap for harmonizing quality indicators in Laboratory Medicine: a consensus statement on behalf of the IFCC Working Group “Laboratory Error and Patient Safety” and EFLM Task and Finish Group “Performance specifications for the extra-analytical phases”, *Clinical Chemistry and Laboratory Medicine (CCLM)*, 55(10), 1478-1488. doi: https://doi.org/10.1515/cclm-2017-0412

E3. ANNEXES

- Annex 1: Use case: Internal Process QC strategy for a DNA biobank.
- Annex 2: Fishbone diagram

E4. REVISION HISTORY

Document number	Revision date	Author	Details of revision
1.04.005		SBP	Initial release

[10] All the aforementioned documents are freely available on: https://swissbiobanking.ch/sops-forms/ and https://swissbiobanking.ch/tissue-and-liquid-data-sets/.

INTERNAL PROCESS QC STRATEGY
DNA BIOBANK

The list of QI and QC provided here is not exhaustive and should be modified or completed depending on the specific biobanking field and sample type.

1 DEFINE QUALITY OBJECTIVES

Providing samples of appropriate quality, anticipating the future analytical needs and purposes that could emerge from research studies.

Providing data of appropriate quality, anticipating the future computational needs and purposes that could emerge from research studies.

Providing appropriate measures for the protection of data and samples.

→ POLICY *Quality Manual*

2 QUALITY INDICATORS (QIs) TO BE MONITORED
3 FOR EACH QI, QCs TO BE CHECKED

IN PROCESS QCs

PARTICIPANT			
1.	Consent form	Is the consent process documented?	→ DATASETS *SBP datasets* → LOG *2.02.006 Participant enrollment log and withdrawal log*
2.	Consent Decision documentation	a. Is the consent decision documented? b. Is the consent decision status updated? c. Is the consent withdrawal documented?	
ENVIRONMENT			
3.	Method validation and instrument qualification	According to the leaflet of the manufacturers, to the literature or to results obtained by the biobank: a. Is method for DNA extraction/isolation/purification validated for the sample type? b. are methods/instruments used to evaluate DNA concentration, purity, integrity and fragmentation validated/qualified for the sample type? c. Are transport and storage conditions (temperature, duration) validated for DNA? d. Are shipping conditions (temperature, duration) validated for DNA?	→ SOP *1.03.002 Validation of methods SOP* → RECORD *2.03.004 Method Validation Record*
4.	Instruments identification, maintenance, calibration, monitoring and cleaning	a. Are all the instruments (fridges, freezers, pipets, vortex, centrifuges, spectrophotometer, fluorometer, automated electrophoresis) identified? b. For each instrument, according to the leaflets of the manufacturers: are maintenance, calibration and cleaning needed and if yes, are they performed? c. For the fridges and freezers: Is temperature recorded by the sensor in the expected range (e.g: 2°C to 8°C for fridges, -25 to -15°C / below -65°C for freezers)?	→ SOP *1.02.002 Equipment management SOP* → RECORD *2.02.002 Equipment calibration record* → RECORD *2.02.003 Equipment maintenance record* → RECORD *2.02.004 Equipment inventory*
5.	Reagents qualification (material)	Is the material qualified (not expired)? (DNA extraction/isolation/purification kits, reagents and buffers, consumables)	→ RECORD *2.02.005 Expiring consumables Inventory*
6.	Staff training	Is every task performed by trained staff?	→ SOP *1.02.001 Personnel Management SOP* → RECORD *2.02.001 Personnel File*
7.	Agreements with external stakeholders	Are Service Level Agreements (SLA) and Material/Data Transfer Agreements (MDTA) signed?	→ TEMPLATE *SLA* → TEMPLATE *SBP hMTA*
SAMPLE			
8.	Identification, Sample primary container, long-term storage container, processes timings, sample appearance, temperatures, sample volume, conditions of centrifugation, sample type	a. Is sample correctly identified? b. Are the primary or long-term containers appropriate? c. Are all the Processes timings documented, and conform to the validation parameters? d. Are all the Processes temperatures documented, and conform to the validation parameters?	→ DATASETS *SBP datasets* → FORM *2.03.001 Sample Tracking Form* → LOG *2.03.002 Shipping Log*
9.	DNA concentration and purity	a. Is measured concentration (fluorometry) > 100 ng/ µl? b. Purity: Is OD 260/280 (spectrophotometry) > 1.6 and < 2.0?	
10.	DNA integrity and fragmentation	Is fragmentation profile as expected (e.g: DNA Integrity number > 7)?	

POST-PROCESS QC

Monitoring every 6 months (examples):

1 to 10

Number of Non-conformities over time, related to different categories: identification, volume, ID, treaceability, data quality, etc. ?

→ SOP *1.04.002 Non-Conformity management SOP*

9 and 10

a. Mean DNA concentration (of comparable samples) over time?
b. Mean purity (of comparable samples) over time?
c. Mean DNA Integrity Number (of comparable samples) over time?
d. DNA Fragmentation profiles evolution over time?

→ REPORT *2.04.007 Non-Conformity Report*
→ LOG *2.04.008 Non-conformity log*

DOCUMENTATION

Quality Indicators and the expected results for in-Process QC are integrated in the BIMS (automatic recordings) or in the Sample acceptance criteria form.

Results obtained for internal QC are registered directly in the BIMS, or documented in the Quality Control Results form.

QC results are reviewed during the management review to serve as a basis for quality improvement process, including corrective actions.

→ REPORT *2.03.003 Sample Acceptance Criteria*
→ REPORT *2.04.009 Quality Control Results*
→ REPORT *2.04.005 Management review report*
→ SOP *1.04.003 Improvement Management SOP*

ANNEX 2

FISHBONE DIAGRAM