Laboratory Services and Biobank Group (LSB)

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The Laboratory Services and Biobank Group (LSB) (Figure 1) works with IARC's Administrative Services Office (ASO) and research Groups to provide core laboratory and biobanking services to support the Agency's research activities. LSB also leads national and international research projects on biobanking and medical research infrastructure. In addition, LSB provides technical and safety advice to the Nouveau Centre project for the future laboratories and biobank, in alignment with the IARC Medium-Term Strategy 2021–2025.

Within the new organizational structure as of 1 January 2021, LSB was renamed as Laboratory Support, Biobanking, and Services.

Figure 1. Laboratory Services and Biobank Group team photo. Courtesy of Xuexun Zhou.

Laboratory services

LSB ensures that optimal laboratory services are available, including a laboratory store that provides consumables, glass-washing facilities, mycoplasma testing and quarantine for cell cultures, pipette checking, and the freezing and/or retrieval of cell lines in nitrogen gas. In conjunction with the Laboratory Steering Committee (LSC), LSB oversees the common laboratory platforms and ensures that equipment is well maintained. Interaction between laboratory-based and epidemiological research is enhanced through the upgrading, updating, and acquisition of state-of-the-art scientific instruments and the provision of sample storage capacity.

Health and safety

Health and safety issues are managed in collaboration with the Occupational Health and Safety Committee (OHSC). The IARC safety manual, a key document, is now available online; it is updated regularly and is aligned with the latest national and international guidelines. The first section of the manual describes the role of all personnel and service providers involved in safety and security at IARC, access conditions, general rules, emergency procedures, and medical services. The second section covers laboratory safety, including personal and collective protection guidelines, management of equipment and cold storage, transport procedures between laboratory floors, laboratory services offered, and good laboratory practice. Information is provided on biological and chemical risks, including risks related to the handling of carcinogens, liquid nitrogen, and laboratory waste.

IARC authorizations for the restricted use of genetically modified organisms (GMOs) are handled by LSB. Radionuclide experimentation has ceased entirely, and the relevant authorizations have not been renewed. LSB initiated the declaration of the biological collections stored at IARC and the authorization to import and/or export biological samples in accordance with CODECOH; this authorization is valid until 2025.

During the biennium, LSB provided 124 safety briefings for newcomers and 28 training sessions for newcomers working in laboratories. LSB made more than 10 presentations to 93 laboratory personnel, covering new guidelines linked to COVID-19 constraints; working with liquid nitrogen, with carcinogens, and with the Fusion FX system; working in the L3 or L2+ laboratories; and completing the Electronic Laboratory Notebook. LSB also published a report on biosafety, describing gaps in current knowledge (Roux et al., 2021).

LSB plays many important roles in the preparation for the move to the Nouveau Centre building, including participating in the laboratory working group, the biobank working group, and the transfer and move working group; several calls for tender; the donation campaign; and the implementation of new procedures.

Biobank services

The IARC Biobank maintains biological sample collections from international studies and operates a service platform for sample retrieval, inventory, aliquoting, DNA extraction and quantification, and reception or shipment of biological material worldwide.

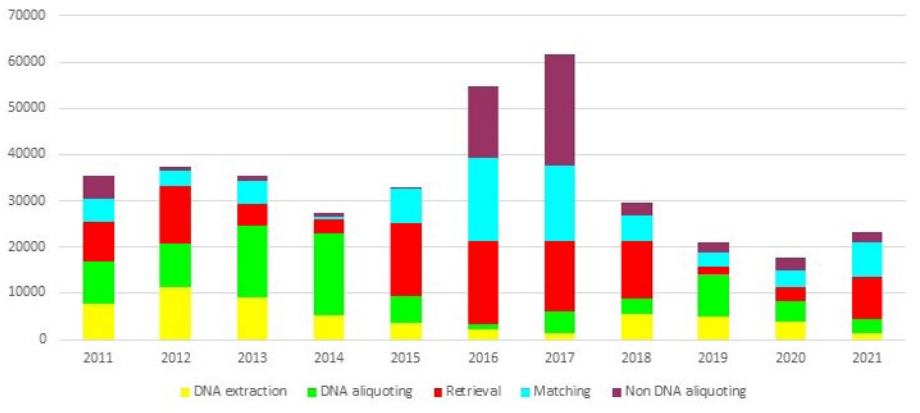
The IARC sample management database (SAMI) stores information on more than 6 million biological specimens. During the biennium, more than 363 000 new samples were imported into SAMI and more than 65 000 samples were accessed for collaborators. SAMI is continuously being upgraded, and version 2.0 was launched in 2020.

The standard procedures that govern sample transfer to and from the Agency and the management of samples were updated (e.g. the new sample disposal policy). During the biennium, 106 Material Transfer Agreements for incoming and outgoing samples were technically validated. LSB supervised the replacement of obsolete equipment and the purchase of new units to increase cold storage capacity to meet future needs as well as provide adequate back-up facilities. A new freezer-temperature monitoring system was validated and installed on cold storage equipment, anticipating the move to and expansion within the Nouveau Centre building.

The Biobank continues to provide pre-analytical services on a cost-recovery basis. During the biennium, 18 projects were serviced, all of which related to requests from international institutions. This resulted in more than 12 000 sample retrievals from liquid nitrogen, 5133 DNA extractions, 7162 DNA aliquots, 5034 plasma and serum aliquots, and 205 receptions or shipments of samples from or to 23 countries worldwide. The Biobank inventoried more than 67 000 individual samples and provided support across the continuum, from reception to data upload into SAMI (Figure 2).

The Biobank continues to participate in international proficiency testing schemes and scored highly in the programmes of DNA extraction from whole blood, frozen tissue, and formalin-fixed, paraffin-embedded tissue and DNA quantification.

Figure 2. An overview of the services provided by the IARC Biobank as at September 2021. © IARC.

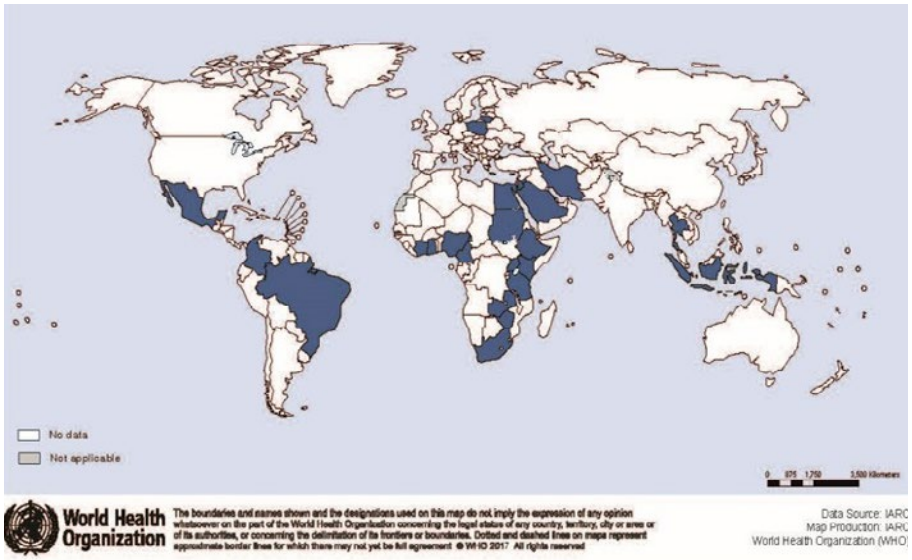


BCNet

LSB participates in several research programmes, in line with IARC's mission of cancer research for cancer prevention. To address the underrepresentation of biological resources in low- and middle-income countries (LMICs) in research, the LMICs Biobank and Cohort Building Network (BCNet; https://bcnet.iarc.fr/) was established by IARC in 2013. Currently, 42 institutions in 23 countries are members of BCNet (Figure 3). During the biennium, BCNet delivered four presentations to external collaborators (in Nigeria, Kenya, the Philippines, and Macao Special Administrative Region, China) and published several seminal articles (Henderson et al., 2020; Kozlakidis, 2020; Vodosin et al., 2021).

BCNet direct funding is provided by the Center for Global Health, National Cancer Institute, National Institutes of Health, USA. LSB gratefully acknowledges all the members of BCNet and their active discussions and exchanges, which have enriched our scientific world as well as our contextual understanding of global research.

Figure 3. Map of BCNet member countries as at September 2021. © IARC.



Collaborations

With regard to infrastructure research, LSB represents IARC at the International Organization for Standardization (ISO; https://www.iso.org/) and at the Biobanking and BioMolecular resources Research Infrastructure–European Research Infrastructure Consortium (BBMRI-ERIC; https://www.bbmri-eric.eu/) (Figure 4). LSB participated in infrastructure research from the perspective of operational readiness and responsiveness (Henderson and Kozlakidis, 2020; Aisyah et al., 2021; Wei et al., 2021b). LSB also contributed to the development of further recommendations and guidelines (Jazieh and

Figure 4. The Biobanking and BioMolecular resources Research Infrastructure–European Research Infrastructure Consortium (BBMRI-ERIC), together with IARC, launched an initiative on better understanding the landscape of paediatric biobanking (https://iarc.who.int/news-events/call-for-participation-and-resource-landscaping-on-elsi-issues-for-biobanking-with-children/). © Adobe Stock.

Kozlakidis, 2020; Vandenberg et al., 2020; Cree et al., 2021a), with a particular emphasis on data and artificial intelligence (Eklund et al., 2020; Kozlakidis, 2020; Kozlakidis and Nigam, 2020), and to the development of a future WHO Academy course.

During the biennium, LSB investigated the impact of the COVID-19 pandemic on infrastructures and cancer patients (Allocca et al., 2020a, 2020b; Di Lorenzo et al., 2020a, 2020b; Aisyah et al., 2021). This research will continue as part of the regional project "Impact of COVID-19 on Cancer" (IMCOCA), a *Projet Structurant* funded by Cancéropôle Lyon Auvergne Rhône-Alpes (CLARA; https://www.canceropole-clara.com/), awarded jointly to Centre Léon Bérard (CLB; https://www.centreleonberard.fr/en) and LSB (Figure 5).

LSB participates in projects funded by the European Commission: the Human Exposome Assessment Platform (HEAP) project (grant no. 874662) (https://heap-exposome.eu/) and the Twinning for the Armenian Research Infrastructure on Cancer Research (ARICE) project (grant no. 952417) (https://www.arice.am/). Funding is provided by BBMRI-ERIC for the European Paediatric Translational Research Infrastructure (https://eptri.eu/) and the Center of Excellence in Biobanking and Biomedical Research at the University of Cyprus (https://biobank.cy/).

Figure 5. The "Impact of COVID-19 on Cancer" (IMCOCA) *Projet Structurant* is funded by Cancéropôle Lyon Auvergne Rhône-Alpes (CLARA) and was awarded jointly to Centre Léon Bérard (CLB) and LSB. Courtesy of CLARA.