

GGBN Member Map 2023

H I H G L I T

S

GGBN May 2023 Newsletter

- 107 Members
- 32 Member Collections Online
- 36 Countries
- 6,978,356 Records
- 2,110,999 DNA and Tissue Samples
- 3,426 Families
- 23,373 Genera
- 80,902 Species



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Formed in October 2011, the Global Genome Biodiversity Network (GGBN) is an international network of institutions that share an interest in long-term preservation of genomic samples representing the diversity of non-human life on Earth.

GGBN provides a platform for biodiversity repositories from across the world to collaborate, ensure consistent quality standards for genomic collections, improve best practices for the preservation and use of such collections, and harmonize the exchange and use of material in accordance with national and international legislation and conventions.



Update From the Executive Committee Chair and Secretariat

We are pleased to share this past year's news and accomplishments with you. Despite the continued challenges due to Covid-19, we made great strides in the global biobanking community, growing the global community of biodiversity biobanks, providing new genetic samples for research, and expanding our resource library. GGBN's membership has grown to include 107 members from across 36 countries and provides data from 32 member collections representing more than 80,000 species of Earth's biodiversity, from unicellular to multicellular organisms, from individual to environmental samples. Today sample data from three million of the approximately 12 to 15 million samples stored in GGBN's collections are available through the GGBN portal.

In 2022, three GGBN institutions were awarded funding to make their genetic collections discoverable through the GGBN data portal, namely Kostrzyca Forest Gene Bank/Poland, Oswaldo Cruz Foundation/Brazil and University of Wyoming Musuem of Vertebrates/United States. These collections will make more than 14,000 samples available for research through the GGBN data portal by September 2024. In 2022, GGBN members providing data to GGBN made 253,153 new samples available for research.

Two GGBN workshops were hosted by members in 2022. The first focusing on data management and data publication through GGBN, hosted by the Instituto de Investigaciones Marinas y Costeras (INVEMAR) and the second focused on micro-organism collections hosted by the Universidad Nacional de Colombia. The two workshops had a combined participation of over 100 with representation from across the Americas and Europe. GGBN also co-organized a seminar on Digital Sequence Information with the DSI Scientific Network and the Global Plant Council.

GGBN continues to improve its best practices and standards for tissue and DNA collections, among other activities through leadership of the SYNTHESYS+ work package that collects and describes standards and processes, and through the Biodiversity Information Standards interest group on Genomic Biodiversity, with a focus on environmental collection sample standards.

We hope to see many of you at the upcoming GGBN Conference in Mexico in October (https://ggbn2023.weebly.com), hosted by the Universidad Autónoma de Aguascalientes.

Ole Seberg (NHM) / Denmark

Executive Committee Chair

Katharine Barker (NMNH) / United States

Program Manager, Secretariat

Jonas Astrin (LIB/ZFMK)/Germany

Executive Committee Vice Chair

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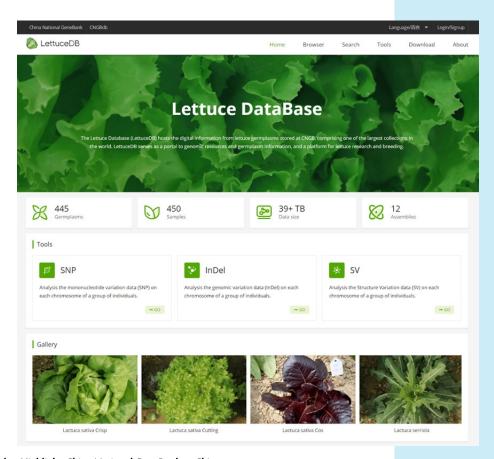
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2023 Priorities

- Organize and hold GGBN 2023 Conference
- Carry out interviews with GGBN stakeholders
- Prepare and evaluate survey for GGBN members
- Discuss future orientation of GGBN
- Start website overhaul
- Publish SYNTHESYS+ NA3 results
- Work with ISBER to complete ISBER Best Practices 5th edition
- Publish annual newsletter and reports
- Publish opinion paper of GGBN document library
- Support network development through in-kind member-driven projects



Member Highlight: China National GeneBank—China

Released by China National GeneBank, the Lettuce Database (LettuceDB) includes over 209 million sequence variants in cultivated lettuce and wild relative species, as well as germplasm passport and phenotypic records of 445 Lactuca accessions. Sequencing of more than 2,500 accessions in progress.

GGBN Meetings



2022 Workshops

Universidad Nacional de Colombia hosted the Micro Organisms Collections: Management and Perspectives symposium November 21st and 28th. The symposium boasted 15 expert panelists and 105 participants from around the world, including Argentina, Brazil, Colombia, Costa Rica, Germany, Mexico, Peru, Spain, Venezuela, Ecuador, Portugal, and Paraguay.

Instituto de Investigaciones Marinas y Costeras (INVEMAR): Data Management and Publication through the Global Genome Biodiversity Network November 7-18. The virtual workshop included 16 speakers and 19 additional participants from across Latin America, Europe and Asia.



Member Highlight—Universidad Autónoma de Aguascalientes/Mexico

The infrastructure of the DNA Bank of the Universidad Autónoma de Aguascalientes is growing due to funding received from the GGBN/GGI 2021 awards program and the Mexican government agency CONACYT.

2023 Conference Announcement

The fourth international GGBN conference will take place in Aguascalientes, Mexico, from October 17th to 20th, 2023, and will be hosted by the Universidad Autónoma de Aguascalientes. The conference will focus on a wide array of topics, from basic databasing processes to environmental specimens and data analysis (sessions and workshops) and will include a discussion session on where we should head in the immediate future to reach GGBN's goals.

Award Programs

2022 Awards Program

A total of four highly competitive proposals representing institutions across four countries were received and ranked by a peer review committee representative of GGBN membership. The panel ranked the proposals on the following metrics: complementarity to existing collections on GGBN; the size, scope, and quality of the collection; the genomic novelty of the collection; adherence to GGBN best practices; the efficiency or cost-effectiveness of the proposal; contribution to the GGBN community; and the timeline for completion. Priority consideration was given to proposals that represent institutions and collections 1) from the global south, 2) from countries with a low or middle-income (based on the latest WESP Economy by per capita GNI), and 3) that strategically address high-level taxonomic gaps in the GGBN Data Portal. The total funding requested was over 60,000 USD, just over 40,000 USD was awarded. Awardees will be contributing over 14,000 new genetic samples to the GGBN data portal by September 2024.

2022 GGBN-GGI Awards

GGBN awarded \$44,189 to three institutions to make their genetic collections discoverable through the GGBN data portal by September 1, 2024. Awardees will be contributing over 14,000 genetic samples to the GGBN data portal by September 2024.

Institution	Country	Samples
University of Wyoming Museum of Vertebrates	United States	6,818
FIOCRUZ	Brazil	434
Kostrzyca Forest Genebank	Poland	6,792

Table 1. Recipients of GGBN-GGI awards 2023.

Member Highlight—National Tropical Botanical Garden/United States

"Working at the National Tropical Botanical Garden for the Global Genome Biodiversity Network has been a real opportunity for me to discover practices such as sampling techniques, seed banking, DNA extraction. Not only I have discovered the world of scientific research and conservation but I also got to learn about a whole culture and its relationship with its endemic plants in an extremely fragile balance. I'm glad I got to play my part in the protection of Hawaii's biodiversity and on the global knowledge of some endangered species." Adèle Poitevin, who worked on the project in summer 2022.

Task Force Updates

Data Standards Task Force

Mission: Develop and expand a global data platform for aggregating relevant data sources of genomic samples, vouchers, molecular analysis, publications and images

In the context of Synthesis+, a policies handbook on using molecular collection was written and published in Research Ideas and Outcomes, it is available at https://riojournal.com/article/102908/. It actively contributes to an objective of developing, implementing and disseminating standardized best practice in biobanking. The handbook is addressed to institution and researchers and provide guidelines and workflow in how to best manage their molecular collection.

Document Library Task Force

Mission: Development and expansion of an online knowledge exchange platform specific to biodiversity biobanking.

The GGBN Document Library Team has been reviewing and updating Tags, Categories and Sub-Categories, cleaning documents and starting on the functional development wish-list. As of March 2023 the library has >1000 curated documents for sharing with biodiversity biobankers worldwide.

The GGBN Document Library includes both English and Spanish content, User Guides for sourcing and uploading materials have been developed in both languages.

Member Highlight— Non-Human Primate Cell Atlas (NHPCA) - China

BGI-Research and China National GeneBank launched the Non-Human Primate Cell Atlas (NHPCA), a single cell transcriptomics data resource that provides visualization and analysis of transcriptomic and forthcoming epigenetic single-cell data sampled from 1.14 million cells of 45 organs from the adult macaques.

https://db.cngb.org/nhpca/



Task Force Updates

Communications Task Force

Mission: Recruit new members and disseminate information to raise awareness of the importance of Tissue and DNA sample information and biodiversity repositories.

GGBN is engaging genomic collections-based partners and marginal communities through the GGBN website, listserv and social media. The GGBN listserv includes over 800 subscribers. Over 300 social media and news posts have been shared across English, Spanish and Chinese speaking platforms.

Biobank Procedures Task Force

Mission: Improve standard operating procedures at biodiversity biobanks.

The Ocean Genome Legacy team published a <u>follow-up study</u> on their previous EDTA experiment showing the <u>effectiveness of tissue</u> <u>preservation in EDTA at increased pH.</u>

The SYNTHESYS+ NA3.1 released "Biodiversity Biobanking — a Handbook on Protocols and Practices", available open access as an 'Advanced Book' at Pensoft (DOI 10.3897/ab.e101876). The handbook is a compilation of protocols and resources and has a focus on viable material, but also on DNA, field collecting, and other aspects of biobanking.

LIB Biobank is also preparing a landscape analysis on biodiversity and environmental biobanks that will announce the aforementioned handbook, presenting the results of a small biobanking community survey and a review, soon to be published in the RIO journal (available already as preprint).

ISBER Best Practices 5th edition is under development and Jonas Astrin (LIB Biobank) is involved as 'Special Advisor' to the editorial board. Release is expected for early/mid 2023.

An opinion paper on crosslinking the efforts in environmental biobanking and metabarcoding has been published in 2022.

Task Force Updates

Policies Task Force

Mission: Support member organizations' work on Access and Benefits Sharing.

DSI Scientific Network - CBD COP15 Outcome Statement

Following three years of negotiation, in December 2022, delegates from 196 Parties to the Convention on Biological Diversity (CBD) adopted the Kunming-Montreal Global Biodiversity Framework (GBF). Digital Sequence Information on genetic resources (DSI) was at the centre of the negotiations. The decision on DSI and benefit-sharing was part of the GBF "package", which includes the GBF Targets and Goals, the GBF monitoring framework, a capacity-building plan for the GBF, and an agreement on increased financing for biodiversity conservation strategies.

The DSI Scientific Network is heartened to see the progress made in coming to a common understanding around DSI and benefit-sharing. The decision openly acknowledges the importance of DSI for sustainable development as well as for meeting the GBF's targets and goals. It also emphasizes the need for further capacity-building initiatives and scientific cooperation to enhance access and use of DSI worldwide.

The decision sets out a process to develop a multilateral mechanism for benefit-sharing from the use of DSI that is consistent with open access to data, avoiding the challenges that would be created by a bilateral approach — such as increased regulatory complexity and administrative burdens which could disproportionately affect research institutes in developing countries where financial, technical and legal resources are particularly scarce.

The adoption of this decision is an important milestone. However, much work remains to be done across the scientific, technical, and policy community to develop the mechanism and implement the decision before the next Conference of the Parties to the Convention (COP16) takes place in 2024. The 2023-24 process includes commissioned studies, submissions and the creation of an Open-Ended Working Group, offering many opportunities for different voices to be heard, including from the scientific community.

Highlights from the DSI decision:

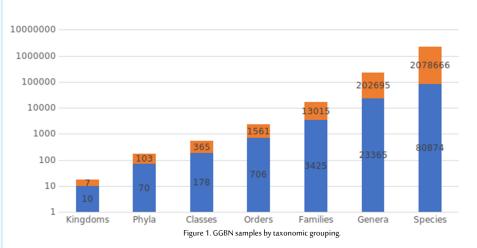
Endorsement of a multilateral mechanism consistent with open access to data: The Network particularly welcomes the decision to create a "multilateral mechanism for benefit-sharing from the use of digital sequence information on genetic resources, including a global fund". This approach is fundamental for researchers' ability to access DSI and compatible with the use of DSI in the service of scientific progress and sustainable development. A bilateral system for tracking and enforcing mutually agreed terms at the level of individual sequences would be extremely complicated, expensive, and challenging to develop and maintain. A multilateral mechanism addresses many of these challenges, enabling predictable and near-term benefit-sharing in accordance with the way DSI is used today.

Acknowledgement of the importance of capacity-building, technology transfer and scientific cooperation: This is another positive outcome that will help overcome institutional, technological, and infrastructural barriers faced by researchers worldwide, such as costly equipment and molecular reagents, limited opportunities for training, and lack of research funding in low- and middle-income countries.

Establishment of an inclusive process to develop the mechanism: The CBD Secretariat will invite governments and observers to submit their views on a list of issues such as capacity development, technology transfer, data governance, and the role and interests of academia. The decision also sets up an Open-Ended Working Group, which will make recommendations to COP16 based on these submissions and the outcomes of the commissioned studies agreed on in the decision. This acknowledges the contributions of different stakeholders in the policy making process and is an opportunity for their further involvement in it.

Collections Highlights

As of February 2023, a total of 3.78 million DNA and tissue samples, 2.479 environmental samples, 29.285 cultures and 2.81 million vouchered specimens are being made discoverable through GGBN by 32 repositories.



General Taxonomic Group	Number of DNAs	Number of Tissues
Plants	38,149	45,470
Fungi	1,455	10
Animals	1,473,785	1,261,039
Archaea	6	0
Bacteria	178	1,786
Chromista	1,322	275
Protozoa	0	5

Table 2. GGBN samples by taxonomic grouping.



Member Highlight—The Kostrzyca Forest Gene Bank/Poland

The Kostrzyca Forest Gene Bank (KFGB), Poland, is a 2022 GGBN Awards program awardee. The main goal of KFGB's program is to make their collection of 225 rare and endangered plant species discoverable through the GGBN by September, 2024. KFGB started its activities in December, 1995. As a part of the State Forests National Forest Holding, KFGB at first focused on the forest tree species. In 2017, KFGB extended its forestry conservation efforts by creating herbarium, DNA and tissue bank collecting the rarest native Polish flora. (Photo: Michał Raj). Work is underway at the Kostrzyca Forest Gene Bank (KFGB) to prepare sample data to be published to the GGBN. In February, 2023 many tissue samples where physically checked to confirm species, data and label accuracy. KFGB is planning to make their plant collection fully accessible by integrating tissue and DNA samples, their associated voucher information and specimen images.

The Kostrzyca Forest Gene Bank's online portal (https://barkodowanie.pl) provides information about many plants stored in their herbarium, DNA and tissue bank.

GGBN Core Member Institutions

Core Member Institution African Centre for DNA Barcoding, University of Johannesburg Alexander von Humboldt Institute for Research on Biological Resources Arctos/Denver Museum of Nature & Science Arctos/Museum of Southwestern Biology Arctos/University of Alaska Museum of the North Arctos/University of California, Berkeley, Museum of Vertebrate Zoology Biodiversity Research and Teaching Collections, Texas A&M University Botanic Garden and Botanical Museum Berlin-Dahlem Centre for Biodiversity Genomics Centro de Ornitología y Biodiversidad Charles University in Prague China National GeneBank Denver Botanic Gardens Hungarian Natural History Museum Institute of Vertebrate Biology, The Czech Academy of Sciences Jawaharlal Nehru Tropical Botanic Garden & Research Institute	Records On GGBN 13,169 9,724 38,774 611,134 297,752 176,762 25,410 53,494 3,001,030 12,285 8,035 22
Alexander von Humboldt Institute for Research on Biological Resources Arctos/Denver Museum of Nature & Science Arctos/Museum of Southwestern Biology Arctos/University of Alaska Museum of the North Arctos/University of California, Berkeley, Museum of Vertebrate Zoology Biodiversity Research and Teaching Collections, Texas A&M University Botanic Garden and Botanical Museum Berlin-Dahlem Centre for Biodiversity Genomics Centro de Ornitología y Biodiversidad Charles University in Prague China National GeneBank Denver Botanic Gardens Hungarian Natural History Museum Institute of Vertebrate Biology, The Czech Academy of Sciences Jawaharlal Nehru Tropical Botanic Garden & Research Institute	9,724 38,774 611,134 297,752 176,762 25,410 53,494 3,001,030 12,285 8,035
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Institute of Vertebrate Biology, The Czech Academy of Sciences Jawaharlal Nehru Tropical Botanic Garden & Research Institute	2,894
Jawaharlal Nehru Tropical Botanic Garden & Research Institute	5,181
•	12,073
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Leibniz Institute DSMZ	37,282
Leibniz Institute for the Analysis of Biodiversity Change, Museum Koenig	261,851
Manaaki Whenua-Landcare Research	8,639
Missouri Botanical Garden	27,440
Museo de Zoología, Pontificia Universidad Católica del Ecuador	61,297
Museum für Naturkunde	11,311
National Institute of Research for Agriculture, Food & Environment	323,752
National Museum of Natural History	273,876
Natural History Museum of Denmark	37,987
Natural History Museum London	43,618
Natural History Museum of Oslo	355,524
National University of Colombia	1,222
New York Botanical Garden	274
Ocean Genome Legacy	76,148
Rio de Janeiro Botanical Garden	7,313
Royal Botanic Gardens, Kew	2,793
Senckenberg Frankfurt and BiK-F	3.744
Steinhardt Museum of Natural History	2,744
University of Kansas Biodiversity Institute	10,086

Opportunities for Involvement



GGBN is currently seeking Chair and Member nominations for its Task Forces as well, with active succession planning for chair positions on biobank procedures and document library. GGBN currently has five Task Forces addressing the following areas:

Data Standards and Data Access for Genomic Samples (Chair: Gabi Droege, Botanic Garden and Botanical Museum Ber-

Policies Related to Management and Stewardship of Genomic Samples (Chair: Amber Scholtz, DSMZ),

Biobank Procedures (Chair: Jonas Astrin, Leibniz Institute for the Analysis of Biodiversity Change, Museum Koenig),

Document Library (Chair: Jackie Mackenzie-Dodds, Natural History Museum London),

Communications and Outreach (Chair: Andrew Iloh, NBIC).

For more information on Task Forces, see Governance and Terms of Reference. Nominations should be sent to GGBN@si.edu for approval by the Executive Committee.

GGBN is actively working this year to complete the redesign of the website, and we are inviting volunteers to help provide feedback and test mock-ups in the following areas:

Sample search and display pages (DNA researcher volunteers invited)

Institutional stats and member pages (GGBN Member volunteers invited)

Content review, navigational mapping review, and wikipage design (all volunteers welcome)

If you are interested, or to learn more, email GGBN@si.edu.

GGBN is coordinating the TDWG Interest Group "Genomic Biodiversity" to work in particular on improving our data standards. One of the main topics is environmental DNA and environmental sample data. For more information, please subscribe to the mailing list: tdwg-gbwg@lists.tdwg.org and visit the following sites:

https://www.tdwg.org/community/gbwg/

https://github.com/tdwg/gbwg

Are you planning to participate in an upcoming meeting that reaches the biodiversity biobank community or biodiversity research community? Contact us at GGBN@si.edu to find out how you can represent GGBN.





































Global Recognition and Cooperation

China National GeneBank DataBase (CNGBdb) was recognized by 20 major international journals and publishing groups, covering 75% of all the publications in life science worldwide. China National GeneBank joined hands with Wiley, Elsevier, and 6 other publishing groups to launch a series of seminars on popular research topics and publication instructions. The seminars attracted more than 90 thousand audiences.

Membership Update

Two new members joined GGBN in 2022, including the University of Wyoming/US and the BBSA Biodiversity Biobanks South Africa consortium/ZA. The BBSA consortium includes the South African National Biodiversity Institute Millennium Seedbank Programme, South African Institute of Aquatic Biodiversity, Agricultural Research Council-National Collection of Fungi, Agricultural Research Council-Entomopathogenic nematodes collection, the University of the Free State-Yeast Culture Collection, and the University of the Western Cape Microbial Biobank.

As of February 2023, there are 107 member institutions. For a complete list of GGBN members, see http:// www.ggbn.org/ggbn_portal/ members/table.

Interested in joining GGBN as a Member? Find out how here: https://wiki.ggbn.org/ggbn/ Membership

Received 2022 Member Contributions - updated January 13, 2023

Institution	Country
ADNUAA	MX
African Centre for DNA Barcoding, University of Johannesburg	ZA
Arctos Consortium	US
Atlanta Botanical Garden	US
Biobank South Africa	ZA
Biodiversity Institute, University of Kansas	US
Botanic Garden and Botanical Museum, Berlin-Dahlem, Freie Universität Berlin	DE
Botanical Research Institute of Texas	US
Centre for Biodiversity Genomics, University of Guelph	CA
Centro de Ornitologia y Biodiversidad	PE
Charles University in Prague	CZ
China National GeneBank	CN
Core Facility Botanical Garden, Faculty of Life Science, University of Vienna	AT
Denver Botanic Gardens	US
FIOCRUZ	BR
Hungarian Natural History Museum	HU
Inala Jurassic Garden	AU
Institute of Vertebrate Biology, The Czech Academy of Sciences	CZ
INVEMAR	СО
Jawaharlal Nehru Tropical Botanic Garden and Research Institute	IN
Leibniz Institute DSMZ-German Collection of Microorganisms and Cell Cultures	DE
Manaaki Whenua Landcare Research	NZ
Museum für Naturkunde, Berlin	DE
Museum of Comparative Zoology, Harvard University	US
Národní Muzeum / National Museum, Prague, Czech Republic	CZ
National Institute of Research for Agriculture, Food and Environment, INRAE	FR
Natural History Museum of Denmark, University of Copenhagen	DK
Natural History Museum, London	GB
Natural History Museum, University of Oslo	NO
New York Botanical Garden	US
Northwestern University Ecological Park & Botanic Gardens	PH
Ocean Genome Legacy, Northeastern University	US
Rio de Janeiro Botanic Gardens	BR
Royal Botanic Garden Jordan	JO
Royal Botanic Gardens, Kew	GB
Senckenberg Frankfurt	DE
Smithsonian National Museum of Natural History	US
Steinhardt Museum of Natural History, Tel Aviv University	IL
Texas A&M University, Biodiversity Research and Teaching Collections	US
Tooro Botanical Gardens	UG
Universidad Nacional de Colombia	СО
University of Tartu National History Museum	EE
Yale Peabody Museum	US
Leibniz Institute for the Analysis of Biodiversity Change (Museum Koenig)	DE
Table 3. GGBN contributing members.	ı

Partner Highlights

Our partners include non-biodiversity biobanks, governmental agencies and other organizations that have an interest in biodiversity biobanks and/or biodiversity informatics. These partners are committed to supporting the goals of GGBN by providing technical expertise and/or participating in GGBN activities. Whenever possible, GGBN representatives are active during annual network meetings, connecting directly with the research community.

Biobanking, Bioinformatics, and Research Partners

Biodiversity Information Standards (TDWG)

China Biodiversity Conservation and Green Development Foundation (CBCGDF)

CryoArks

Darwin Tree of Life Project

Earth Biogenome Project (EBP)

Entomological Collections Network (ECN)

European, Middle Eastern & African Society for Biopreservation and Biobanking (ESBB)

Genomic Standards Consortium (GSC)

Global Biodiversity Information Facility (GBIF)

Global Genome Initiative (GGI)

Global Genome Initiative for Gardens (GGI-Gardens)

13

International Society for Biological and Environmental Repositories (ISBER)

Specify Collections Consortium (Specify)

Symbiota

Join GGBN as a Partner!

Are you interested in Partnering with GGBN? Contact us at info@ggbn.org

GGBN VISION: A global network of well-managed collections of genomic samples from across the Tree of Life, benefiting society through biodiversity research, development, and conservation.

GGBN MISSION: To foster collaborations among biodiversity repositories in order to ensure quality standards, improve best practices, secure interoperability, and harmonize exchange of material in accordance with national and international legislation and conventions.

