

MEMORANDUM OF UNDERSTANDING

BETWEEN: **INTERNATIONAL BARCODE OF LIFE (iBOL) Corporation**
having its head office at 50 Stone Road East, Guelph,
Ontario, N2G 2W1, CANADA

hereinafter called iBOL

AND: **xxx**

hereinafter called xxx

WHEREAS the International Barcode of Life (iBOL) is a Canadian not-for-profit corporation, having its head office at 50 Stone Road East, Guelph (Ontario), N1G 2W1;

WHEREAS the purpose of iBOL is to support the cooperation of an international network of scientists and funding agencies focused on (a) sample acquisition and expansion of the DNA barcode reference library for multicellular eukaryotes (b) development of analytical technologies and bioinformatics resources for DNA barcoding, and (c) capacity building and knowledge transfer to stimulate global adoption of DNA barcoding;

WHEREAS the Party(ies) signatory to this document are coordinating xxx involvement as a National Node in iBOL through the xxx composed of leading researchers involved in DNA barcoding and representatives of the key organizations supporting the discovery and protection of xxx biodiversity.

WHEREAS the Parties wish to collaborate for the mutual benefit of their programs;

IN WITNESS WHEREOF, THE PARTIES AGREE AS FOLLOWS:

1. SCOPE

This document outlines the intended role of countries participating as National Nodes in the International Barcode of Life (iBOL) Project.

2. BACKGROUND

DNA barcoding is a methodology for rapidly and accurately identifying species by sequencing a short segment of standardized gene regions and comparing individual

sequences to a reference database. iBOL is a research alliance involving nations that have committed both human resources and funding to enable expansion of the global reference database, the development of informatics platforms, and /or the analytical protocols needed to use the reference library to inventory and assess biodiversity.

3. DEFINITIONS

3.1 iBOL

iBOL refers to the International Barcode of Life Corporation, its Board of Directors, its Secretariat, and its National Nodes.

3.2 National Nodes

National Nodes are networks of researchers and organizations in a country that are engaged in DNA barcoding or in supporting such work as part of iBOL.

3.3 iBOL Core Facilities

iBOL Core Facilities are laboratories and technology platforms established by iBOL National Nodes. These core facilities provide the DNA barcoding research community with sequencing and/or informatics support.

4. UNDERTAKING

The Parties will, subject to future funding commitments, maintain xxx as a National Node within iBOL, following the “*Guidelines for Participation – iBOL Phase II*”, as described in Appendix I, and will participate in iBOL’s research programs.

5. ORGANIZATION OF COOPERATION

xxx will designate an individual who will join iBOL’s Scientific Steering Committee (SSC). Members of the SSC meet annually to share information on the accomplishments of each Node. The SSC meeting aligns every second year with the International Barcode of Life Conference. In the other year, it occurs at a site decided by the SSC members.

6. PRESS RELEASE

The Parties will jointly decide whether or not to issue any press releases and other forms of publicity covering this MoU or the activities associated with it, but this provision will not limit public disclosure legally required of any of the Parties individually.

7. EFFECTIVE DATE

This MoU has an Effective Date when all Parties have executed this agreement.

8. TERM

The term of this MoU shall commence on the Effective Date and shall continue in effect until December 31, 2025 so long as xxx is compliant with the conditions of membership (Appendix 1).

Either party to this MoU may terminate the present agreement with prior notice of ninety (90) days.

9. LIABILITY

This MoU does not create any liability between the parties nor any binding or legal partnership or association, and each party remains a legally independent party. Neither party shall be liable for any act of the other party.

10. EXECUTION

CONSEQUENTLY THE PARTIES HAVE EXECUTED THE PRESENT MoU ON THE RESPECTIVE DATES MENTIONED BELOW.

**INTERNATIONAL BARCODE OF
LIFE (iBOL) CORPORATION**

XXX

Per: _____
Paul Hebert, Chair of the Board

Per: _____

Date: _____

Date: _____



APPENDIX 1: CONDITIONS FOR PARTICIPATION – iBOL PHASE II

RATIONALE

Globalization of trade, climate change, and calls for biodiversity conservation make rapid species identifications a worldwide need. DNA barcoding is a powerful addition to traditional approaches; identifications can be automated and analysis can extend to all life stages, to fragments and to DNA molecules recovered from the environment.

BACKGROUND

DNA barcoding, the analysis of patterns of sequence diversity in short, standardized gene regions, allows specimens to be assigned to known or new species. Because of their digital format, DNA barcode libraries allow the automation of specimen identification and species discovery. This automation is massively improving our ability to understand, monitor, and manage biodiversity with major scientific, forensic, and economic benefits. Because the development of a DNA barcode reference library for all species is both prohibitively expensive and logistically impossible for any nation, the benefits of creating an international partnership to assemble this resource were clear from the outset. In response, leaders of the biodiversity science community activated the International Barcode of Life (iBOL) project.

GOVERNANCE

iBOL was established in 2010 as a Canadian not-for-profit corporation. Throughout its first five years, iBOL's Board of Directors was composed of representatives from funding agencies involved in supporting the consortium. To strengthen its connection with the organizations best positioned to enable the research, iBOL's Board was subsequently restructured so it is now largely comprised of senior representatives from major natural history museums. iBOL's Board functions in a strategic capacity, reviewing research progress and providing suggestions on how to accelerate it. In addition, a Scientific Steering Committee (SSC) comprised of one researcher from each participating nation aids in the design and implementation of research activities. Although the SSC is primarily focused on coordinating research activities, it is also responsible for selecting the location for the biannual International Barcode of Life conference. Both the Board and the SSC meet annually.

iBOL PHASE I (2010–2015)

Researchers from 25 nations activated iBOL in 2010 to advance the construction of a DNA barcode library for multi-cellular eukaryotes. This research alliance demonstrated its competence by delivering DNA barcodes for 500,000 species by 2015. It also developed the informatics tools and the analytical protocols needed for DNA barcoding to emerge as a vital component of the global biosciences infrastructure. To permit this progress, nations involved in iBOL raised >\$100 million from grant councils, government agencies, philanthropists, and the private sector. Most of these funds were expended within their source nation to support contributions to the project, but overall progress benefitted greatly from \$50 million provided by Canadian agencies to establish a core facility that provided essential sequencing and informatics support to the iBOL community.

iBOL PHASE II (2016–2025)

Since completion of iBOL's first phase in December 2015, discussions have made clear the need to sustain iBOL to realize the scientific mission begun during Phase I. Although overall research goals and strategies will be revisited on an annual basis by the SSC, Phase II has five core goals:

- 1) Develop high-throughput sequencing (HTS) protocols that greatly reduce the cost of assembling the DNA barcode reference library and that enable the analysis of museum specimens, making it possible to obtain barcode coverage for 1.5 million species by 2025.
- 2) Employ DNA metabarcoding to obtain comprehensive biodiversity baselines for ecoregions covering >50% of the land area in each participating nation by 2025. Although sequences will not be directly linked to their source specimen, this work will involve the sequence characterization of at least 100 million specimens.
- 3) Extend the informatics platforms needed to support both expansion of the DNA barcode reference library and studies that employ metabarcoding for bio-surveillance.
- 4) Engage with regulatory agencies to advance the adoption of DNA barcoding as a standard tool for the detection of invasive species, for the assessment of water quality, for environmental impact assessments, for aiding food sustainability, for the suppression of product substitution, and for forensics, especially related to the enforcement of CITES.
- 5) Create the organizational structures and seek the funding commitments needed to activate the Planetary Biodiversity Mission in 2026. This 20-year research program will complete the census of all multi-cellular species, will activate a global bio-surveillance system, and will construct a 'library of life' holding DNA extracts from all species.

RESOURCES

Achieving Phase II goals will require \$100–\$200 million over the next decade. The effort to raise these funds is proceeding on a project-by-project, and a nation-by-nation basis. For example, the Ontario Ministry of Research, Innovation and Science and the Canada First Research Excellence Fund have committed \$25 million, and additional support is likely from other Canadian agencies. These funds will ensure the vitality of the informatics platforms and the DNA sequencing facility required to achieve iBOL's goals. Substantial funding commitments are also in place in other nations; most reflect awards committed during iBOL Phase I.

MEMBERSHIP

Since iBOL's activation in 2010, member nations have advanced their research agendas at greatly reduced individual cost. iBOL has developed into a true partnership; all participating nations set research priorities and oversee progress. Researchers in member nations benefit from access to specimens, to DNA sequencing services, to informatics platforms, and to training.

Participation as a National Node in iBOL-II is open to all nations with the scientific expertise and the funding to substantively contribute to its research goals. The annual membership fee is \$5,000

CAD due on June 30 of each year. Membership fees cover expenses linked to operation of the corporation including meetings of the Board and the SSC.

BENEFITS OF MEMBERSHIP

- 1) The Secretariat will cover all costs (flight, accommodation, meals) for each national representative to participate in the annual meeting of the Scientific Steering Committee. In every second year, this meeting will coincide with the International Barcode of Life Conference.
- 2) The Scientific Steering Committee will select from among its membership the nation that will host the biannual International Barcode of Life Conference, ensuring the iBOL community has a forum to discuss research progress.
- 3) The Scientific Steering Committee will seek funding to allow researchers in member nations to participate in large-scale collaborative research.
- 4) The Canadian Node will direct \$1 million annually through 2025 to extend the two informatics platforms (BOLD, mBRAVE) required for the storage, curation, and use of DNA barcode records.

DATA DEPOSITION

To ensure the long-term preservation, discoverability, and fitness-for-use of data produced by iBOL, all DNA sequences and associated meta-data must be deposited in BOLD (boldsystems.org), the central informatics platform for the iBOL project.

For further information, visit <http://www.ibol.org>