

# Consortium for the Barcode of Life

## Terms of Reference

### PREAMBLE

“DNA barcoding” was proposed by Dr. Paul Hebert in 2002 as a standardized technique for assigning biological specimens to their correct species using a short gene sequence. The number of interested researchers and potential users grew quickly, and the Alfred P. Sloan Foundation recognized the importance of DNA barcoding to science and society. The concept of an international Barcode of Life Initiative (BoLI) and an international Consortium for the Barcode of Life (CBOL) emerged during two planning workshops held in 2003 with support from the Sloan Foundation.

### *Recognizing that*

- DNA barcode data are proving highly effective in assigning specimens to known species;
- DNA barcode data, used in conjunction with traditional taxonomic characters such as morphology, behavior, and ecological habits, will allow taxonomists to make species delimitations more precise;
- Barcode data complement traditional data by integrating pre-adult stages and highly dimorphic sexes into more comprehensive species definitions;
- Barcode data can be extremely useful to fields of science beyond taxonomy such as applied biology and ecosystem science that rely on accurate and reliable species identifications;
- DNA barcoding can create a global library of reference records that can be used by non-taxonomists to identify specimens, thereby freeing taxonomists from routine identification services and reducing the “Taxonomic Impediment”; and

### *Aware that*

- Taxonomy is a scientific discipline with a long and rich history and well-established norms and standards;
- Many global initiatives are underway to reduce the Taxonomic Impediment, thereby increasing access to taxonomic information;
- The use of molecular data in taxonomy is widespread and increasing; and

### *Desiring to*

- Explore the potential of DNA barcoding as a research tool and as a practical system for assigning biological specimens to their correct species;
- Make taxonomic data more accessible and valuable to society at large;
- Promote DNA barcoding as a global standard for specimen identification;
- Promote global participation in BoLI; and
- Create mutually beneficial partnerships with ongoing initiatives, thereby avoiding unnecessary duplication of effort,

***The Member Organizations of the Consortium of the Barcode of Life affirm the importance and potential value of BoLI and agree to participate in the activities described in these Terms of Reference.***

## **MISSION AND OBJECTIVES**

CBOL's mission is to explore and develop the potential of DNA barcoding as a practical tool for species identification in taxonomic research, biodiversity studies and conservation, and for diverse applications that use taxonomic information in service to science and society.

In pursuing its mission, CBOL has the following objectives:

- Creating a public database of reference barcode data that are linked to voucher specimens, valid species names and associated information;
- Populating the barcode database with records from all taxonomic groups and geographic regions, starting with the groups and regions for which a species identification system is most needed;
- Expanding the community of researchers involved in BoLI;
- Increasing the community of users who are applying barcode data to scientific and practical problems; and
- Promoting the development of protocols, instruments, techniques and other tools needed by researchers who want to produce barcode data and the diverse stakeholders who want to use them.

## **ORGANIZATION AND PROCEDURES**

CBOL will operate as a catalyst for distributed activities that are planned and conducted by its members, usually in partnership with other initiatives in biodiversity, taxonomy and systematic research. Very few CBOL activities will be overseen entirely and only by CBOL. Accordingly, CBOL will operate with the smallest possible bureaucracy and will conduct its projects as distributed, collaborative activities. CBOL will conduct most of its administrative business through electronic mail and telephone conference calls.

## **PARTICIPANTS**

CBOL will consist of Member Organizations, an Executive Committee, an Implementation Board, and a Secretariat Office.

***Member Organizations.*** CBOL encourages diverse organizations from around the world to become CBOL Member Organizations, and to become active participants in BoLI through CBOL's activities. Membership in CBOL is open to natural history museums, zoos, herbaria, botanical gardens, universities and their constituent departments and institutes, other research bodies, conservation organizations, government agencies, NGOs, private companies, and other organizations with an interest in biodiversity and species identification. Organizations join CBOL when a senior official of that organization signs a Memorandum of Cooperation, a legally non-binding statement that expresses the organization's interest in BoLI and CBOL's activities, and its willingness to submit its barcode data to a public repository. The Memorandum of Cooperation that is currently in place expires on 31 August 2009.

Membership in CBOL involves no financial contribution to CBOL or other commitment of resources. Member Organizations nominate potential members of CBOL's Executive Committee. CBOL will hold meetings of the representatives of Member Organizations in conjunction with International Barcode Conferences, which are held approximately every two years. CBOL will provide Member Organizations with quarterly newsletters to keep them informed of CBOL

activities and will promote their active participation through ongoing communications through a list-serve and electronic meetings.

***Executive Committee.*** CBOL will be directed by an Executive Committee which will meet twice yearly and will be responsible for:

- Setting the strategic direction, policies, and priorities of CBOL, developed with input from Member Organizations and the Implementation Board;
- Representing the interests of CBOL's Member Organizations while pursuing CBOL's mission;
- Overseeing the preparation and submission of grant proposals (including the CBOL grant to the Sloan Foundation), and meeting all the terms and conditions of grants received by CBOL;
- Creating and overseeing CBOL's major activities, described below;
- Approving all major expenditures of grant funds;
- Appointing members to the Implementation Board; and
- Overseeing the work of the CBOL Secretariat Office, including the selection of the CBOL Executive Secretary.

CBOL's Executive Committee will consist of:

- A Chair, who will be the Principal Investigator of the primary grant supporting CBOL. For 2004-2008, this is the grant from the Alfred P. Sloan Foundation;
- CBOL's Executive Secretary;
- Five individuals selected from candidates nominated by the Member Organizations; and
- *Ex officio* members invited by the Executive Committee to address specific issues.

The Chair's term of appointment coincides with the duration of funding for CBOL from the Sloan Foundation. The Executive Secretary will be a full-time employee of CBOL, supported by the Sloan Foundation grant, selected by the Executive Committee, and hired on fixed-term contracts. Initially, the other five members of the Executive Committee were approved by the Member Organizations as a slate of candidates selected by the Chair and Executive Secretary from among nominees from Member Organizations. To stagger terms of appointment to the Executive Committee and avoid discontinuity, the initial terms of appointment were for one year (two members) or two years (three members). These initial terms of appointment may be renewed once for two years. Subsequent to the initial appointees, members of the Executive Committee will be appointed for a term of two years, renewable once for a second two-year term.

Following the initial appointments, all appointees to the Executive Committee will be selected using the following procedure:

- Nominations will be solicited from Member Organizations by the Secretariat;
- The nominees will be screened by the Secretariat with the goal of ensuring a balance on the Executive Committee with respect to geographic region, scientific expertise, taxonomic coverage, and gender;
- The resulting slate of candidates will be presented to the Executive Committee, including those members whose terms are coming to an end, for review, adjustment, and preliminary approval; and

## Terms of Reference, Consortium for the Barcode of Life

- The slate of candidates will then be presented to the Member Organizations via electronic mail for their approval. The slate of candidates will be considered approved if objections by fewer than 20% of the Member Organizations are received within two weeks.

Members of the Executive Committee and their terms of appointment are presented in Appendix 1.

**Implementation Board.** CBOL's Executive Committee will appoint an Implementation Board that will meet annually and will:

- Act as a meeting ground for the Chairs of each of CBOL's major activities and the leaders of selected barcoding activities outside of CBOL;
- Facilitate information exchange and coordination across CBOL activities and barcoding initiatives outside of CBOL;
- Provide the Executive Committee with annual reports of the progress being made by each of CBOL's major activities;
- Provide the Executive Committee with advice on scientific and technical matters, including suggestions for new CBOL activities and priorities; and
- Respond to requests from the Executive Committee for information and reviews of proposals for new CBOL activities.

The Implementation Board will consist of:

- The Chair of, or other designated representative, of the Leading Lab Network and each CBOL Working Group, Campaign, and Demonstration Project;
- The Chair of, or other designated representative of major barcoding initiatives outside CBOL selected by the Executive Committee; and
- Representatives of other significant biodiversity initiatives that, in the Executive Committee's judgment, are essential CBOL partners.

Members of the Implementation Board and their terms of appointment are presented in Appendix 2.

**Secretariat Office.** CBOL's Executive Committee will oversee a Secretariat Office that will:

- Implement the strategies and priorities established by the Executive Committee;
- Prepare proposals to the Executive Committee for new activities, and for CBOL's overall Program of Work;
- Provide the Member Organizations, Executive Committee and Implementation Board with regular reports of activities and progress;
- Perform outreach that will expand participation in CBOL and the Barcode Initiative in both developed and developing countries;
- Provide administrative support to CBOL's major activities;
- Carry out the administrative functions of CBOL, including financial and programmatic management of grants to CBOL; and
- Assist the participants in major CBOL activities in their efforts to obtain funding for their activities.

The Secretariat Office will consist of an Executive Secretary and an Administrator, and any additional staff members whose positions will be approved by the Executive Committee. Members of the Secretariat Office staff will be employed on term appointments subject to the availability of funding and will report to the Chair of the Executive Committee.

## **CBOL ACTIVITIES**

CBOL's Major Activities will include:

- Working Groups that address large-scale problems that many, if not all, barcoding projects will encounter. Working Groups will be open and inclusive and will focus on technical issues. CBOL has commissioned the following Working Groups:
  - Database Working Group, created in Washington, DC in May 2004;
  - Plant Working Group, created in Washington, DC in May 2004; and
  - Data Analysis Working Group, created in London in February 2005;
- The Leading Lab Network, created in Washington, DC in July 2007, consisting of the most active barcoding labs around the world and dedicated to protocol development, technical assistance, promoting the establishment and success of barcoding centers in all regions of the world, and increasing the flow of barcode records into the public domain;
- Barcoding "campaigns" and "demonstration projects" that obtain representative barcodes for large numbers of species in particular taxonomic groups;
- Networks that promote communication and cooperative barcoding projects among groups of individuals and organizations that share an interest that can be served by barcoding; and
- *Ad hoc* committees formed to address a specific issue related to DNA barcoding.

Each CBOL activity will provide the Executive Committee, through the Secretariat Office and Implementation Board, with:

- An initial statement of goals and mission;
- A nominated leader and list of 5-10 core members;
- A brief description of its program of work; and
- Periodic reports of progress towards its goals.

The Executive Committee will be responsible for assessing the effectiveness of all activities and may decide to reconstitute or discontinue an activity.

CBOL's major activities may request financial and administrative support from the Secretariat Office. Support from the Sloan Foundation grant may be used for catalytic activities such as planning meetings and for partial support of workshops and conferences. Sloan Foundation funds cannot be used for research, research infrastructure, training courses, or capacity building. In most cases, leaders of CBOL activities will need to seek support of their activities from funding sources other than CBOL and the Sloan Foundation.

CBOL will also encourage the initiation of smaller barcoding projects, but CBOL will not be involved in the administrative or financial support of these smaller projects.

## **CHANGE OF STATUS**

The current version of the Memorandum of Cooperation signed by each CBOL Member Organization expires on 31 August 2009. Prior to that date, CBOL's Executive Committee will review CBOL's progress towards its goals. Based on the results of that evaluation, the Executive Committee may propose an extension of the Memorandum of Cooperation to the Member Organizations which would extend CBOL's operation beyond that date.

It is the responsibility of each Member Organization to inform the CBOL Secretariat of a change in its membership status as outlined in these Terms of Reference. It is the responsibility of each

member of the CBOL Executive Committee and Implementation Board to inform the CBOL Secretariat of changes in his or her participation as outlined in these Terms of Reference.

#### **ADOPTION AND AMENDMENT**

These Terms of Reference were adopted by CBOL's Executive Committee at its meeting in Cape Town, South Africa, on Sunday, 9 April 2006.

Amendments to the Terms of Reference were approved by email on 30 November 2007. These amendments:

- updated terms of appointment of Executive Committee (see membership, Appendix 1);
- gave the Executive Committee the ability to appoint *ex officio* members to the Executive Committee and appoint *ad hoc* advisory committees;
- established the Implementation Board (see membership, Appendix 2);
- disestablished the Scientific Advisory Board (see membership, Appendix 3);
- updated the list of Major CBOL activities by disestablishing the DNA Working Group (May 2004-November 2007) and establishing the Leading Lab Network; and
- specified new activities that improve communication with and among CBOL's Member Organizations.

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#### **Appendix 1. Members of CBOL's Executive Committee**

Dr. José Alves-Gomes, Instituto Nacional de Pesquisas da Amazônia, Manaus  
(initial term 20 June 2005 to 19 June 2007; renewed and served through 31 December 2007)

Dr. James Edwards, Global Biodiversity Information Facility, Copenhagen  
(initial term 20 June 2005 to 19 June 2006; renewed through 19 June 2008)

Richard Lane, The Natural History Museum, London  
(initial term 20 June 2005 to 19 June 2006; renewed through 19 June 2008)

Dr. Helida Oyieke, National Museums of Kenya, Nairobi  
(initial term 20 June 2005 to 19 June 2007; renewed through 19 June 2009)

Simon Tillier, Museum National d'Histoire naturelle, Paris  
(initial term 20 June 2005 to 19 June 2007; renewed through 19 June 2009)

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## **Appendix 2. Members of CBOL's Implementation Board**

### **Working Group Chairs:**

Robert Hanner, University of Guelph, Canada; Chair, Database WG and Coordinator of FISH-BOL (appointed 1 January 2008)

Peter Hollingsworth, Royal Botanic Gardens Edinburgh, UK; Chair, Plant WG (appointed 1 January 2008)

Neil Sarkar, Marine Biological Laboratory, Woods Hole, MA, USA; Chair, Data Analysis WG (appointed 1 January 2008)

Lee Weigt, Smithsonian Institution, Washington, DC, USA; Chair, Leading Lab Network (appointed 1 January 2008)

### **CBOL Campaign and Project Leaders:**

George Amato, American Museum of Natural History; Chair of DNA Barcoding for Conservation Initiative

Ken Cameron, NY Botanical Garden; Chair of TreeBOL

Yvonne Linton, Natural History Museum London; Mosquito Barcoding Initiative Coordinator

Marc De Meyer, Royal Museum of Central Africa, Tervuren, Belgium; Tephritid Barcoding Initiative Coordinator

Dirk Steinke, University of Guelph, Canada; Coordinator for MarBOL

Mark Stoeckle, Rockefeller University, New York; Coordinator for ABBI

Pablo Luis Tubaro, Museum of Natural Sciences, Argentina; ABBI Chair

### **Liaisons for Associated Initiatives:**

Paul De Barro, CSIRO Agriculture, Australia; liaison for invasive species

Scott Federhen, National Center for Biotechnology Information, Bethesda, Maryland; Head of GenBank Taxonomy (appointed 1 January 2008)

Paul Hebert, University of Guelph; Chair of iBOL Initiative (appointed 1 January 2008)

Daniel Masiga, ICIPE, Nairobi, Kenya, liaison for east African initiatives

Sujevan Ratnasingham, Biodiversity Institute of Ontario; Lead for BOLD (appointed 1 January 2008)

**CBOL's Executive Committee is now finalizing a list of interim members of the Implementation Board who will serve as liaisons to emerging barcoding projects.**

Appendix 3. Members of CBOL's Scientific Advisory Board

**Term Members:**

Freek Bakker, National Herbarium, Netherlands, Chair of SAB (initial Vice-Chair of SAB, term 1 August 2005 to 30 July 2007; renewed through 30 July 2009)

Karen Armstrong, Lincoln University, New Zealand, Vice-Chair of SAB (initial appointment 1 August 2005 to 30 July 2007; renewed through 30 July 2009)

Paul De Barro, CSIRO, Sydney, Australia (initial term 4 May 2006 to 3 May 2007; renewed through 30 July 2009)

Paul Hebert, University of Guelph, Canada; (appointed Chair of DNA WG, 1 August 2005; replaced on 21 October 2006; initial term 21 October 2006 to 20 October 2008)

Peter Ng, National University of Singapore (initial term 4 May 2006 to 3 May 2008)

Daniel Masiga, ICIPE, Nairobi, Kenya (initial term 4 May 2006 to 3 May 2007; renewed through 30 July 2009)

Athula L.T. Perera, University of Peradeniya, Sri Lanka (initial appointment 1 August 2005 to 30 July 2007; renewed through 30 July 2009)

Cecilia Saccone, CNR Institute of Biomedical Technologies, Italy (initial term 1 August 2005 to 30 July 2006 ; renewed through 30 July 2008)

Ole Seberg, University of Copenhagen, Denmark (initial term 1 August 2005 to 30 July 2006 ; renewed through 30 July 2008)

Pablo Luis Tubaro, Museum of Natural Sciences, Argentina (initial term 1 August 2005 to 30 July 2006 ; renewed through 30 July 2008)

**Working Group Chairs:**

Robyn Cowan, Royal Botanic Gardens Kew, UK; Chair of Plant WG (appointed 1 August 2005)

Michel Veuille, National Museum of Natural History, Paris, France ; Chair of Data Analysis WG (appointed 1 August 2005)

Robert Hanner, University of Guelph, Canada; Chair of Database WG (appointed 1 August 2005)

Lee Weigt, Smithsonian Institution, Washington, DC, USA; Chair, DNA Working Group (appointed 21 October 2006)

**Former SAB Members :**

James Hanken, Harvard University, USA; (initial Chair of SAB, term 1 August 2005 to 30 July 2006 ; declined renewal)

Sandro Luis Bonatto, Pontifícia Universidade Católica do Rio, Brazil (initial term 1 August 2005 to 30 July 2006 ; declined renewal)