



Convention on Biological Diversity

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**Conference of the Parties to the Convention on
Biological Diversity serving as the meeting of the
Parties to the Cartagena Protocol on Biosafety
Twelfth meeting
Yerevan, 19–30 October 2026
Item 14 of the provisional agenda*
Detection and identification of living modified organisms**

Detection and identification of living modified organisms

Note by the Secretariat

I. Introduction

1. In its decision [CP-11/8](#), the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety invited Parties, other Governments, participants in the Network of Laboratories for the Detection and Identification of Living Modified Organisms, developers and other relevant organizations to submit to the Secretariat of the Convention on Biological Diversity technical reference documents and other materials related to new quantitative polymerase chain reaction techniques, digital polymerase chain reaction, next-generation sequencing and isothermal amplification techniques in order to complement and update future editions of the *Training Manual on the Detection and Identification of Living Modified Organisms in the Context of the Cartagena Protocol on Biosafety* (Biosafety Technical Series 05).¹ In addition, it invited Parties to share, through the Biosafety Clearing-House, information on their experience with new detection techniques, such as those for detecting newly developed and unauthorized living modified organisms, and with developing, using and maintaining reference materials, and invited Parties, other Governments and relevant organizations to share and make available through the Biosafety Clearing-House training materials and reference publications.

2. In the same decision, the Conference of the Parties serving as the meeting of the Parties to the Protocol requested the Secretariat, among other things, to continue to collect publications and technical resource materials on the sampling, detection and identification of living modified organisms and make them available through the dedicated portal in the Biosafety Clearing-House, to prepare a compilation of the submitted technical reference documents and other materials and to collaborate with relevant organizations and provide capacity-building support to Parties in the field of detection and identification of living modified organisms, including hands-on training of laboratory personnel on both traditional analytical methods and new detection techniques.

3. The present document contains an overview of the work undertaken pursuant to decision [CP-11/8](#) in the form of a summary of the submitted information on the detection and

* [CBD/CP/MOP/12/1](#).

¹ Available at <https://bch.cbd.int/en/database/VLR/BCH-VLR-SCBD-260177-3>.

identification of living modified organisms (sect. II), the online discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms (sect. III), the outcomes of the workshop on the detection and identification of living modified organisms and the role of customs officials in implementing the Protocol (sect. IV) and the information collected by the Secretariat that is relevant to the detection and identification of living modified organisms (sect. V). Section VI provides an overview of Biosafety Technical Series 05 and of the latest developments in the detection and identification of living modified organisms, section VII information on other relevant activities and developments and section VIII suggested elements of a draft decision. Estimated extrabudgetary resource requirements for activities proposed in the draft decision are provided in the annex.

II Information submitted by Parties and relevant organizations

4. In response to paragraphs 1 and 3 of decision [CP-11/8](#), the Secretariat invited through notification No. [2026-010](#) Parties, other Governments, participants in the Network of Laboratories for the Detection and Identification of Living Modified Organisms, developers and relevant organizations to submit technical reference documents and other materials related to: (a) new quantitative polymerase chain reaction techniques; (b) digital polymerase chain reaction; (c) next-generation sequencing; and (d) isothermal amplification techniques. In the same notification, it also invited Parties, other Governments and relevant organizations to share and make available through the Biosafety Clearing-House training materials and reference publications.

5. In response, the Secretariat received submissions from six Parties² and three organizations,³ which have been made available through the Biosafety Clearing-House.⁴ In addition, two reference publications were submitted as virtual library resources through the Biosafety Clearing-House.⁵

6. The submissions included scientific publications, technical guidance documents, methodological reports, laboratory protocols, validation studies, training materials and other technical reference materials relevant to the four techniques mentioned in notification No. [2026-010](#). In addition to information related to the topics identified in decision [CP-11/8](#), several submissions included references to laboratory quality management, method validation, reference materials and other technical considerations relevant to laboratory implementation.

7. A bibliographical compilation of the technical reference documents received is provided in document CBD/CP/MOP/12/INF/5.

III. Online discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms

8. To support the requests in decision [CP-11/8](#), the Secretariat convened online discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms from 24 November to 5 December 2025. The discussions were co-moderated by David Dobnik (Slovenia) and Melina Pérez Urquiza (Mexico). Twenty-nine participants from 20 Parties and five organizations exchanged a total of 100 interventions.

9. The discussions were organized around four topics: experiences and challenges in implementing new techniques for the detection and identification of living modified organisms; experience with detecting and identifying newly developed living modified organisms, unauthorized living modified organisms and stacked events; experiences and challenges with developing, using

² Belarus, Ethiopia, European Union, Germany, Slovenia and Türkiye.

³ Council for Scientific and Industrial Research-Crops Research Institute, CropLife International and Rio Institute.

⁴ Available at <https://bch.cbd.int/en/submissions-to-notifications?schema=submission¤tPage=1¬ification=2026-010>.

⁵ Available at <https://bch.cbd.int/en/database/VLR/BCH-VLR-SCBD-293575-2> and <https://bch.cbd.int/en/database/VLR/BCH-VLR-SCBD-293576-1>.

and maintaining reference materials; and role of regional networks in supporting knowledge-sharing and inter-laboratory comparisons.

10. Under topic 1 (experiences and challenges in implementing new techniques for the detection and identification of living modified organisms), participants reported significant differences in the technical and institutional capacities of laboratories to implement advanced analytical methodologies. While some laboratories described experience with digital polymerase chain reaction, next-generation sequencing and other advanced approaches, many indicated that routine analyses continued to rely primarily on conventional or real-time polymerase chain reaction methods. Participants identified financial, technical and institutional constraints, including the costs of specialized equipment, reagents and consumables, procurement challenges and limited technical expertise, as major barriers to broader implementation. Continued capacity-building was highlighted as a solution, in particular in relation to digital polymerase chain reaction, next-generation sequencing and bioinformatics.

11. With regard to new analytical techniques more specifically, there was a view that the higher costs associated with next-generation sequencing platforms, together with the need for specialized laboratory infrastructure and bioinformatics expertise, limited their wider adoption for routine analyses at the present time. In contrast, several participants considered that analytical workflows based on digital polymerase chain reaction could be readily implementable, noting that recent advances in multiplexing had improved the cost-effectiveness and applicability of digital polymerase chain reaction for certain routine analyses.

12. Under topic 2 (experience with detecting and identifying newly developed living modified organisms, unauthorized living modified organisms and stacked events), some participants reported limited or no practical experience with the detection and identification of newly developed or unauthorized living modified organisms. Participants indicated that current analytical approaches generally relied on screening for commonly used genetic elements, followed, where possible, by event-specific methods for confirmation. It was noted that stacked events are generally identified through the detection of the individual events that constitute them. Several participants identified limitations in the availability of validated methods, reference materials, positive control materials and other technical resources as important constraints affecting the detection and identification of such living modified organisms.

13. Under topic 3 (experiences and challenges with developing, using and maintaining reference materials), participants consistently reported that certified reference materials were often expensive, difficult to procure and unavailable for many living modified organisms. Several participants indicated that those constraints had led laboratories to adopt alternative solutions, including laboratory-developed or other well-characterized reference materials, positive and negative control materials, synthetic DNA materials, genomic DNA, artificial plasmids and applicant-provided materials. Among laboratories relying on such approaches, formal certification was generally described as not feasible because of financial, regulatory or institutional barriers, in particular where international procurement was challenging and the resources needed for certification were limited. Participants also highlighted collaborative approaches to the characterization and validation of reference materials through inter-laboratory cooperation and the application of digital polymerase chain reaction for value assignment, thus illustrating how laboratories were adapting to the limited availability of certified reference materials.

14. Under topic 4 (role of regional networks in supporting knowledge-sharing and inter-laboratory comparisons), participants shared diverse experiences regarding national and regional laboratory networks. Where the networks were active, participants described them as valuable mechanisms for exchanging expertise, strengthening technical capacity, harmonizing analytical methods and supporting proficiency testing and inter-laboratory comparisons. Several participants also reported that networks in their regions had become inactive or were not yet established and identified sustainable funding as a principal challenge to their continuity. Others were unaware of the existence

or activities of networks in their regions. The importance of strengthening regional collaboration through regular training, experience-sharing and inter-laboratory comparison programmes was highlighted.

15. A summary of the online discussion of the Network of Laboratories can be found in document CBD/CP/MOP/12/INF/4.

16. Furthermore, to ensure the currency of the membership of the Network of Laboratories, the Secretariat asked Parties, other Governments and relevant organizations through notification No. [2025-133](#) to nominate experts to join and participate in the online discussions of the Network. As at 30 June 2026, a total of 90 experts were registered in the Network of Laboratories, comprising 78 participants from 32 Parties, 2 from one non-Party and 10 from seven organizations. The Secretariat continues its efforts to expand the membership of the Network.

IV. Workshop on the detection and identification of living modified organisms and the role of customs officials in implementing the Cartagena Protocol

17. In response to subparagraph 8 (c) of decision [CP-11/8](#), the Secretariat, in close collaboration with Slovenia and its National Institute of Biology, and with the financial support of Denmark, held in Ljubljana from 22 to 26 September 2025 a workshop on the detection and identification of living modified organisms and the role of customs officials in implementing the Protocol. The workshop combined theoretical and practical training on laboratory methodologies for the detection and identification of living modified organisms, the implementation of the Protocol, and the role of customs authorities in facilitating the safe transboundary movement of living modified organisms.

18. A total of 32 participants from 12 countries, comprising laboratory personnel, representatives of competent national authorities and customs officials, attended the workshop. The programme included plenary sessions, laboratory demonstrations, practical exercises on rapid on-site testing, real-time polymerase chain reaction and digital polymerase chain reaction, presentations on quality assurance and reporting, as well as the national experience-sharing. The workshop also served to promote collaboration among laboratory personnel, competent national authorities and customs officials to strengthen coordination in the implementation of the Protocol.

19. During the concluding discussions, participants highlighted the value of the hands-on laboratory training, in particular on digital polymerase chain reaction techniques, and emphasized the importance of collaboration, information-sharing and capacity-building to strengthen national laboratory systems and customs frameworks. Participants also identified the need to improve access to reference materials, proficiency testing programmes and regional cooperation and requested additional opportunities for practical training on emerging analytical methodologies, such as digital polymerase chain reaction and laboratory accreditation.

20. The report of the workshop has been made available as document [CBD/CP/DI/WS/2025/1/2](#).

V. Information collected by the Secretariat

21. In response to subparagraph 8 (a) of decision [CP-11/8](#), the Secretariat continued to collect publications, technical resources and reference materials relevant to the detection and identification of living modified organisms and made them available through the dedicated portal on sampling, detection and identification of living modified organisms in the Biosafety Clearing-House. During the intersessional period, a new “Publications and technical materials” section was added under the “Resources” menu of the sampling, detection and identification portal.⁶ Between 1 January 2025 and

⁶ Available at <https://bch.cbd.int/en/portals/detection/resources/publications-and-technical-materials>.

30 June 2026, 22 new virtual library resource records related to detection and identification were added to the Biosafety Clearing-House.

VI. Biosafety Technical Series 05 and latest developments in the detection and identification of living modified organisms

22. In April 2022, the Secretariat published the *Training Manual on the Detection and Identification of Living Modified Organisms in the Context of the Cartagena Protocol on Biosafety* (Biosafety Technical Series 05). The training manual covers the fundamentals of biosafety and the Protocol, the principles and methodologies for the detection and identification of living modified organisms and the complete analytical workflow from sampling and sample preparation to laboratory analysis, quality assurance and quality control and reporting. It is focused primarily on protein and DNA-based methods, with detailed examples of conventional end-point polymerase chain reaction and real time polymerase chain reaction.

23. The manual also includes a dedicated section on novel technologies for the detection and identification of living modified organisms, introducing emerging analytical approaches, including digital polymerase chain reaction, next generation sequencing and isothermal amplification techniques. While those methods are recognized as promising tools, the manual does not provide detailed technical guidance on their application, as a result of their emerging status at the time of publication.

24. As recognized in the discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms⁷ and the outcomes of the workshop held in Ljubljana, digital polymerase chain reaction represents an important development in the field of detection and identification of living modified organisms. Compared with conventional quantitative polymerase chain reaction, it provides improved sensitivity, precision and reproducibility, enabling reliable detection and absolute quantification of low concentrations of target DNA without the need for calibration curves or certified reference materials. While initial investments in digital polymerase chain reaction systems are currently relatively high, declining costs and protocol optimization, including multiplexing, are progressively improving its cost-effectiveness for routine laboratory use. Although an increasing number of technical guidance and resources are available, there remains a need for a comprehensive training resource that integrates the scientific principles, methodological considerations and practical applications of digital polymerase chain reaction for the detection and identification of living modified organisms.

25. In contrast, for next-generation sequencing, which was also raised during the discussions of the Network of Laboratories in 2023 and 2025, routine implementation continues to be constrained by the high cost of instrumentation, the need for advanced bioinformatics capabilities and specialized technical expertise. There are additional challenges related to the practical implementation for the detection and identification of living modified organisms, such as bulk and mixed shipments and limited availability of validated quantitative protocols. While the technology is advancing rapidly, the current state of implementation and practical experience require further development.

26. Regarding isothermal amplification techniques, such as loop-mediated isothermal amplification, the main applications relate to rapid screening and in-field testing, offering the potential for simple and cost-effective detection without the need for sophisticated laboratory infrastructure. Although promising, further research and development are required to provide a sufficient basis for its applicability for detecting and identifying living modified organisms, as relatively few methods and practical case studies are currently available. Nevertheless, future developments in isothermal amplifications techniques should continue to be monitored.

⁷ Available at <https://bch.cbd.int/en/portals/detection/network-of-labs/forum-2025>.

VII. Other relevant activities and developments

27. In addition to actions taken pursuant to the requests of the Conference of the Parties serving as the meeting of the Parties to the Protocol, the Secretariat has also been involved in other activities that may be relevant to the work undertaken on the detection and identification of living modified organisms.

1. Online Forum on Capacity-building for Biosafety

28. In support of the implementation of the capacity-building action plan for the Protocol adopted in decision [CP-10/4](#), the Secretariat convened an online forum on capacity-building for biosafety, from 14 to 18 July 2025.⁸ The Forum was held to facilitate discussions on biosafety capacity-building, further elaborate identified needs and priorities and mobilize a community of stakeholders working together on capacity-building activities. Under topic 1 of the forum (capacity-building priority needs and challenges), participants identified strengthening capacities for the detection and identification of living modified organisms as one of the main capacity-building priority needs for the implementation of the capacity-building action plan.

29. Participants also highlighted a number of priorities for strengthening capacities in the detection and identification of living modified organisms, such as enhancing laboratory infrastructure and technical resources, providing continuous training for laboratory personnel, regulators and border-control authorities, strengthening laboratory quality control systems and collaborative activities, promoting regional and international cooperation, including through laboratory networks, and ensuring sustainable financial support to maintain and further develop national and regional technical capacities. The identified priorities highlight the fact that many Parties continue to face challenges in ensuring the sustainable operation, maintenance and continuous development of laboratory capacities for the detection and identification of living modified organisms.

30. The report of the Online Forum has been made available as document [CBD/CP/CB/OM/2025/1/2](#).

2. Key elements arising from the fifth assessment and review of the implementation plan for the Cartagena Protocol

31. In accordance with decisions [CP-10/3](#) and [CP-10/4](#), the Secretariat undertook the fifth assessment and review of the effectiveness of the Protocol and the midterm evaluation of the implementation plan and the capacity-building action plan for the Protocol. The assessment drew on information provided by Parties through their fifth national reports and included an evaluation of progress towards Goal A.8 of the capacity-building action plan (Parties are able to detect and identify living modified organisms). In addition, relevant information related to the detection and identification of living modified organisms was obtained from the assessments of Goal A.6 (Parties prevent and address illegal and unintentional transboundary movements of living modified organisms) and Goal A.7 (Parties have measures in place to fulfil the handling, transport, packaging and identification requirements of living modified organisms under Article 18 of the Protocol). The findings relevant to the detection and identification of living modified organisms are summarized below.

32. The analysis of information submitted in response to Goals A.8, A.6 and A.7 of the implementation plan indicated continued efforts to strengthen analytical capabilities through the implementation of quality assurance systems and participation in laboratory networks and proficiency testing activities. Parties emphasized regional disparities in access to and use of certified reference materials and the important role of regional cooperation and the Network of Laboratories for the Detection and Identification of Living Modified Organisms in facilitating the exchange of technical knowledge and experience. They also identified ongoing challenges in sustaining laboratory capacity, including with regard to accreditation, certified reference materials, equipment

⁸ See <https://bch.cbd.int/en/portals/capacity-building/forum>.

and trained personnel, as well as the operational implementation of identification requirements, highlighting the need for continued training of customs officers, stronger cross-sectoral cooperation and enhanced technical support for the detection and identification of living modified organisms.

33. During the preparation of the fifth assessment and review, the Secretariat compared the laboratories reported by Parties in their fifth national reports with those listed in the registry of laboratories available through the Biosafety Clearing-House and found that many reported laboratories were not reflected in the registry, highlighting the need to improve the completeness and currency of the information available through the Biosafety Clearing-House.

34. The analysis of the fifth national reports was made available as document [CBD/SBI/7/6/Add.1](#).

VIII. Possible elements for consideration by the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol

35. The Conference of the Parties serving as the meeting of the Parties to the Protocol may wish to adopt a decision⁹ along the following lines:

The Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol,

Recalling its decisions [CP-10/11](#) of 10 December 2022 and [CP-11/8](#) of 30 October 2024,

Noting the progress reported by Parties in their fifth national reports in relation to the detection and identification of living modified organisms under the Cartagena Protocol on Biosafety,¹⁰ and acknowledging the findings of the fifth assessment and review of the effectiveness of the Protocol,¹¹

Noting also the challenges faced by many Parties in ensuring the sustainable operation, maintenance and continuous development of laboratory facilities involved in the detection and identification of living modified organisms and the significant differences in technical and institutional capacities that continue to exist among Parties,

1. *Invites* Parties, other Governments and relevant organizations to review and update, as appropriate, the information contained in the registry of laboratories available through the Biosafety Clearing-House and to nominate additional laboratories and experts to participate in the Network of Laboratories for the Detection and Identification of Living Modified Organisms;

2. *Encourages* Parties to support the establishment, revitalization and strengthening of regional networks of laboratories and partnerships to promote capacity-building, knowledge-sharing and technical cooperation in the detection and identification of living modified organisms;

3. *Also encourages* Parties to develop long-term national strategies for the sustainable operation, maintenance and continuous development of laboratory facilities involved in the detection and identification of living modified organisms, including through institutional support and regional cooperation;

4. *Invites* Parties, other Governments and international organizations to provide financial resources, in particular for developing countries, especially the least developed countries and small island developing States, and countries with economies in transition to strengthen laboratory infrastructure, technical expertise and laboratory quality control systems for the detection and identification of living modified organisms;

5. *Decides* to develop a supplemental chapter on digital polymerase chain reaction to complement the *Training Manual on the Detection and Identification of Living Modified Organisms in the Context of the Cartagena Protocol on Biosafety* (Biosafety Technical Series No. 5);

⁹ The estimated extrabudgetary resource requirements for the activities outlined in the draft decision are shown in the annex to the present document.

¹⁰ United Nations, *Treaty Series*, vol. 2226, No. 30619.

¹¹ See [CBD/SBI/7/6/Add.1](#).

6. *Requests* the Executive Secretary:

(a) To draft the supplemental chapter on digital polymerase chain reaction referred to in paragraph 5 above, in collaboration with the Network of Laboratories for the Detection and Identification of Living Modified Organisms;

(b) To convene online discussions of the Network of Laboratories to facilitate the development and peer review of the supplemental chapter, for its subsequent consideration by the Subsidiary Body on Scientific, Technical and Technological Advice;

7. *Requests* the Subsidiary Body on Scientific, Technical and Technological Advice to review the draft supplemental chapter and make a recommendation for consideration by the Conference of the Parties serving as the meeting of the Parties to the Protocol at its thirteenth meeting;

8. *Requests* the Executive Secretary, subject to the availability of resources:

(a) To explore ways to strengthen the Network of Laboratories for the Detection and Identification of Living Modified Organisms, including by facilitating the visibility of regional and subregional laboratory networks and related collaborative initiatives and by encouraging the participation of additional laboratories and experts in the Network;

(b) To continue to improve the dedicated portal on the sampling, detection and identification of living modified organisms in the Biosafety Clearing-House;

(c) To continue to collaborate with relevant organizations in order to provide practical and hands-on training on the detection and identification of living modified organisms to laboratory personnel and to customs and border-control officials.

Annex

Estimated extrabudgetary resource requirements

The table below has been prepared to show the estimated extrabudgetary resource requirements for the activities requested of the Secretariat, as outlined in the draft decision, in support of its consideration. The present annex is not part of the draft decision submitted for consideration by the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety.

Extrabudgetary resource requirements

(United States dollars)

<i>OP</i>	<i>Activity</i>	<i>Meeting costs^a</i>	<i>Staff travel</i>	<i>Staff costs^b</i>	<i>Subtotal</i>	<i>PSC (13 per cent)</i>	<i>Total</i>
8 (c)	One training activity (workshop or other) for laboratory personnel and one for customs and border-control officials (20 participants each)	138 000	21 000	–	159 000	20 670	179 670
	Total				159 000	20 670	179 670

Abbreviations: OP, operative paragraph of the draft decision; PSC, programme support costs.

^a Including participants' travel.

^b Consultants, partners and additional staff.