Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction	19 August 2010 English Only

2010 Meeting
Geneva, 6–10 December 2010

Meeting of Experts
Geneva, 23–27 August 2010
Item 5 of the provisional agenda
Consideration of the provision of assistance and coordination with relevant organizations upon request by any State Party in the case of alleged use of biological or toxin weapons, including improving national capabilities for disease surveillance, detection and diagnosis and public health systems.

German activities on improving national detection capabilities: First International Proficiency Test on the Analysis of Ricin

Submitted by Germany

1.   The protein toxin *ricin* produced by the plant *Ricinus communis* is a substance of special interest according to the Australia Group (AG) list and Schedule 1 of the Chemical Weapons Convention (CWC). The possible misuse for military and terrorist weapons purposes links ricin also with Article I of the Biological and Toxin Weapons Convention (BTWC). Its high toxicity and the wide availability of castor beans, the seeds of the plant, combined with the lack of specific therapeutic countermeasures to intoxications by ricin require detection procedures that will allow the detection of minor quantities of the toxin.

2.   The detection of ricin is a real challenge as protein toxins are often produced in different variants or isoforms. In the absence of the producing organism and its genetic information the detection of nucleic acid is not possible. Rather a combination of immunological, functional and spectrometric methods needs to be applied for reliable detection.

3.   The *1st Ricin Workshop of the Global Health Security Action Group (GHSAG) Lab Network* in 2007, organized by the Robert-Koch-Institut (RKI), Berlin, identified several unresolved questions regarding technical and standardization issues around the detection of ricin. The lack of quality control measures was identified as a major gap. In parallel, experts from the OPCW temporary working group "sampling and identification" expressed interest in taking part in a ricin proficiency test.

4.   The *1st International Proficiency Test on the Analysis of Ricin* in the framework of GHSAG and OPCW was started in October 2009 with participants from 17 laboratories from twelve countries. The major goal of the test focused on obtaining information on the status quo of qualitative and quantitative ricin detection in expert laboratories. With respect to experimental approaches all detection methods established at workbench could be applied. Six samples containing purified ricin were distributed to the participating laboratories. Discrimination of pure ricin versus crude *R. communis* extract was part of the test.

5.   The preparation of the test required extensive paperwork with regard to export/import control legislation of the participating countries, notification of the OPCW according to the CWC, and coordination with the shipment company.

6.   The test showed an overall acceptable performance of the participating labs, however, deficits could be clearly identified: e.g. four of the seventeen participating laboratories correctly identified all samples on a qualitative basis; eleven correctly identified the crude *R. communis* extract.

7.   The results of the very useful exercise were presented at the RKI in November 2009 where the participants productively discussed about an optimal ricin detection scheme. Consensus was achieved on a pure ricin standard that was distributed to interested participants for their quality assurance purposes.

8.   The proficiency test confirmed that these kinds of exercise are absolutely necessary for improving the qualitative and quantitative detection of ricin. Next steps could include: testing time lines for detection, detection in complex matrices and discrimination of active versus inactive material. Tests for other toxins, i.e. botulinum toxins, should be considered.

9.   Special thanks from RKI go to the Spiez Laboratory and CHEMSTAT, both in Switzerland, for excellent cooperation in preparing and assessing the proficiency test.

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