



**EUROPEAN COMMISSION**  
DIRECTORATE-GENERAL  
**Joint Research Centre**



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# **TRAINING COURSE ON**

## **THE ANALYSIS OF FOOD AND FEED SAMPLES FOR THE PRESENCE OF GENETICALLY MODIFIED ORGANISMS**

**September 18-22, 2006**

**University of Tunis Elmanar - Faculty of Sciences  
Laboratory of Molecular Genetics, Immunology and  
Biotechnology  
Tunis, Tunisia**



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## **COURSE CONTENT**

### **Covered topics:**

- ❑ Overview of EU legislation on GMOs and specific requirements
- ❑ Introduction on the general procedures for GMO detection
- ❑ Experimental planning and sample preparation
- ❑ DNA extraction
- ❑ Qualitative PCR for GMO analysis
- ❑ Real-time PCR for GMO quantification
- ❑ Sampling concepts and recommended EU protocol
- ❑ Laboratory implementation and conduction of a GMO detection laboratory
- ❑ Implementation of ISO 17025 for accreditation in a GMO testing laboratory
- ❑ Method validation criteria

### **Experimental work:**

- ❑ Sample preparation and DNA extraction
- ❑ Qualitative PCR
- ❑ GMO quantitative analysis by real-time PCR
- ❑ Data analysis, expression and interpretation of the results

The course will provide overall scientific and technical information on sampling and on the analytical approaches for GMO analysis as well as hands on experience on how the methods are performed in the laboratory. In addition, the course will provide information on the different theoretical and technical requirements for proper laboratory implementation and conduction of testing activity according to current legislative requirements.

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# WORKPROGRAMME

## 1<sup>ST</sup> DAY – MONDAY, SEPTEMBER 18<sup>TH</sup> 2006

- 9:00 am Welcoming speech – opening of the course – **Prof. Marrakchi - Univ. Tunis**
- 9:15 am Introduction to the course, presentation of the organizers and of the participants – **M. Querci - JRC**
- 9:30 am **Theory:** Introduction on the general procedures for GMO detection and course content. - **M. Querci - JRC**

### PREPARATION OF SAMPLES: DNA EXTRACTION

- 10:10 am **Experimental:** DNA extraction following the CTAB method - Part 1
- 10:40 am Coffee break
- 11:00 am **Experimental:** Preparation of agarose gels  
DNA extraction following the CTAB method - Part 2
- 1:00 pm Lunch
- 2:00 pm **Experimental:** DNA extraction following the CTAB method - Part 3
- 3:00 pm **Experimental:** Sample loading
- 3:45 pm Coffee break
- 4:00 pm **Theory:** Sample preparation and DNA extraction - **N. Foti – JRC**
- 5:00 pm **Experimental:** interpretation of the gels
- 5:20 pm Transport to the hotel

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## 2<sup>ND</sup> DAY – TUESDAY, SEPTEMBER 19<sup>TH</sup> 2006

### QUALITATIVE PCR

- 9:00 am **Theory:** Introduction to the Polymerase Chain Reaction and to the use of PCR for GMO analysis – **M. Querci - JRC**
- 10:00 am **Experimental:** Qualitative PCR  
Plant specific: detection of the **zein** and **lectin** genes
- 10:45 am Coffee break
- 11:00 am Preparation of agarose gels
- 11:20 am **Theory:** Characteristics of GM soybean and maize events and introduction to GMO specific nested PCR – **M. Querci - JRC**
- 12:20 pm Lunch
- 1:30 pm Sample loading
- 2:00 pm **Theory:** General consideration on PCR laboratory set up and on quality system implementation – **C. Charles-Delobel - JRC**
- 3:00 pm Interpretation of the gels (*zein* and *lectin* specific PCR)
- 3:15 pm Coffee break
- 3:45 pm **Experimental:** screening PCR: detection of the 35S promoter
- 4:45 pm Transport to the hotel

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## 3<sup>RD</sup> DAY – WEDNESDAY, SEPTEMBER 20<sup>TH</sup> 2006

### QUALITATIVE PCR

- 9:00 am **Experimental:** nested PCR for the specific detection of Roundup Ready® soybean (1<sup>st</sup> PCR reaction)
- 10:00 am Preparation of agarose gels
- 10:30 am Coffee break
- 11:00 am **Seminar:** Introduction to the European legislation on GMOs – **M. Querci - JRC**
- 12:00 pm Sample loading (35S specific PCR)
- 12:30 pm Lunch
- 1:30 pm **Experimental:** nested PCR for the specific detection of Roundup Ready® soybean (2<sup>nd</sup> PCR reaction)
- 2:30 pm **Experimental:** preparation of agarose gels
- 3:00 pm Coffee break
- 3:30 pm **Theory:** Introduction to Real-Time PCR for GMO detection and quantification – **C. Charles-Delobel - JRC**
- 4:45 pm **Experimental:** sample loading (nested PCR products)
- 5:15 pm Transport to the hotel

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## **4<sup>TH</sup> DAY – THURSDAY, SEPTEMBER 21<sup>ST</sup> 2006**

### **QUANTITATIVE REAL-TIME PCR**

- 9:00 am **Experimental:** Interpretation of the gel Roundup Ready soybean specific nested PCR
- 9:15 am Preparation of samples for the Real-Time PCR for the specific detection of Roundup Ready® soybean and samples loading
- 10:30 am Coffee break
- 11:00 am **Theory:** Real-Time PCR for GMO quantification – Part 2. – **C. Charles-Delobel - JRC**
- 12:15 pm Lunch
- 1:15 pm **Experimental:** Experimental design, data analysis and interpretation – **N. Foti – JRC**
- 2:45 pm **Seminar:** The JRC and its role in the European Community – **M. Querci - JRC**
- 3:30 pm Coffee break
- 3:45 pm **Seminar:** Method Validation and role of the Community Reference Laboratory – **C. Charles-Delobel - JRC**
- 4:45 pm Transport to the hotel

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## **5<sup>TH</sup> DAY – FRIDAY, SEPTEMBER 22<sup>ND</sup> 2006**

- 9:00 am **Theory:** Serological approach for the detection of GMOs - **M. Querci – JRC**
- 10:00 am Coffee break
- 10:30 am **Seminar:** Sampling: basic principles – **M. Querci - JRC**
- 11:30 am **Seminar:** The Tunisian experience towards the establishment of a GMO testing facility – **Prof. Marrakchi - Univ. Tunis**
- 12:30 pm Lunch
- 2:00 pm **Round table:** Troubleshooting, data interpretation and practical experimental issues. Questions and answers session
- 3:00 pm General discussion and conclusion of the course
- 3:30 pm Transport to the hotel or airport