



- ▶ All Actions
- ▶ Biomedicine and Molecular Biosciences (BMBS)
- ▶ Chemistry and Molecular Sciences and Technologies (CMST)
- ▶ Earth System Science and Environmental Management (ESSEM)
- ▶ **Food and Agriculture (FA)**
 - In Detail
 - **Actions**
 - Restricted Area
- ▶ Forests, their Products and Services (FPS)
- ▶ Individuals, Societies, Cultures and Health (ISCH)
- ▶ Information and Communication Technologies (ICT)
- ▶ Materials, Physics and Nanosciences (MPNS)
- ▶ Transport and Urban Development (TUD)
- ▶ Trans-Domain Proposals

FA COST Action 853

Agricultural Bio-Markers for Array Technology

Descriptions are provided by the Actions directly via e-COST.

The aim of the Action was to constitute a European network of laboratories with similar interests that collaborate in the evaluation of the suitability of the developed array-products on a pan-European scale.

The Action mainly focused on evaluation of the technique for agricultural purposes such as diagnostics, large scale screening and breeding.

New strategies for detecting pests and plant pathogens have been developed in order to improve and harmonise the diagnostic procedures within the European Community. To give just one example, the PRI-Lock and Pad-Lock systems, which are under patenting procedure, have been successfully set up. Furthermore, several DNA-based microarrays have been created for pathogen identification, such as plant viruses or bacteria which are among the EPPO list of quarantine species. Other microarray chips focusing on identification of agronomically relevant characters such as self-incompatibility alleles in cherry, or on identification of beneficial insects have also been developed within the COST Action 853.

Reproducibility tests among laboratories were performed in order to validate the efficiency of the microarray technique as common diagnostic tool. Results demonstrated the need of thorough teaching and training before the sensitivity and specificity of the technique can be reached with equal success in all the laboratories.

Among the objectives of our COST Action was to build a "universal" chip containing the probes of all pathogenic species dealt with during the COST Action. This objective was replaced by the developing a set of several species specific microarrays. The main reason for this was that, because the many laboratories involved in this Action have different facilities within their institutions, it is difficult to homologue the different parameters involved in the microarray experiments. For example, different coating substrates of the slides are used, probe type and length are different, printing buffers are dependent on the printing device, and there are differences in hybridisation conditions which are relative to the length of the DNA to hybridise on the chip.

Another objective of our Action was to establish a probe database. However, it proved to be difficult to collect probe sequence data when private companies were involved in the development of the technology.

Soon after the onset of the Action it became clear that for diagnostics purposes in the field of agronomy, DNA-based arrays were much easier to develop and use than protein based arrays and hence, most of the participating scientists originally working on protein arrays got soon more involvement in DNA-based arrays. The main activity of WG2 throughout most of the Action was therefore to observe the developments of protein arrays and to report the progress at the meetings.

However, in both the initial phases of the Action as well as towards the final phase, several groups within the Action were doing laboratory work and were reporting on it.

One of the major successes of the Action was the development of the Short-Term Scientific Mission Workshops. This model improved exchanges of skills and knowledge within European laboratories. Actually this COST Action organising this STSM-Workshops was the beginning of the original initiative to start the modality of "training school" within the COST programme.

The format proved to be highly efficient both in terms of use of laboratory space and time as well as for the experts. Several highly successful STSM workshops (later trainingschools) were organised to teach newcomers the specificities of the microarray technique (in Bremen and York, 2004). A more advanced bioinformatics course on

Food and Agriculture COST Action 853

Description

- ▶ Parties
- ▶ Management Committee



General Information*

Chair of the Action:
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Vice Chair of the Action:
[Mr Gunter ADAM](#) (DE)

DC Rapporteurs:
[Dr Marianna SCHAUZU](#) (DE)

Science officer of the Action:
[Dr Ioanna STAVRIDOU](#)

Administrative officer of the Action:
[Mr Christophe PEETERS](#)

Downloads*

Action Fact Sheet
[Download AFS as .RTF](#)

Memorandum of Understanding
[Download MoU as PDF](#)

Final Report
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Websites*

Action website:
<http://www.cost853.ch/>

Domain website:
<http://www.cost.eu/fa>

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Publications

- ▶ [Agricultural Biomarkers for Array Technology](#)

ARB software utilisation and probe design was organised in Zürich, 2006. These workshops were complemented with several individual STSMs that have allowed young scientists to join research groups in order to learn new techniques.

Contacts with several private companies were established to develop some promising results. For example, collaboration with BioTrove to enlarge the use of its Pad-Lock system and collaboration with Nimblegen for production of chips containing hundred thousands of probes for species identification through pattern hybridisation.

Finally, the last meeting held in May 2007, together with the Trans-COST ARRAY meeting (members from many other COST actions participated), was a real success with 75 participants actively involved in microarray technology and with expertise in the different aspects of its uses either in diagnostics or for gene expression studies. Presentations from experts in different scientific domains (medicine, bacteriology, animal or plant breeding, plant

physiology and more; see www.cost853.ch) were an excellent occasion to discover the broad quantity of results and discoveries obtained with this technique. They also revealed the constant need for its improvement in several aspects such as the probe design, reproducibility among laboratories and data analysis.

At the last management committee meeting it was decided to collect contributions from the most recent developments and achievements of collaborators within this COST Action 853 and to publish them in a small book printed by COST Brussels. The book covers most of the vast area of microarray related research and development that was conducted in the frame of our Action and thus it is a concise summary demonstrating the great success of COST Action 853. It helps all those interested in the topic to get a quick overview on the state-of-the-art of diagnostic microarrays in agriculture and, as it also contains the names and addresses of all contributing scientists, it is a guide to the top European researchers that are working in this field.

Also the home page functioned very well. The home page statistics show that in the time window (only part of the action running time) the homepage had 27.259 visits from 9.575 different visitors. 3.6% of the visitors came via external homepages (home institute of the chair or COST 853 home page). Most visitors went directly to publications, to participating scientists/ MC memberslist.

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