

## **iPlanta Final Conference**

**25 March 2021**

**This conference was held as a webinar due to the virus pandemic.**

The Conference was opened by Bruno Mezzetti, Chair of the iPlanta COST Action who discussed the mechanisms of RNA interference and how knowledge and development of the technology had progressed during the 4 year period of iPlanta. He described how the original concept of studying plant expressed RNAi had progressed to studying topical applications of dsRNA to control pests and diseases and that the scientific programmes of many researchers involved in iPlanta had switched accordingly. The programme of webinars organised in the final year of iPlanta reflected this change of emphasis.

Jeremy Sweet, vice chair of iPlanta, described the first webinar, which discussed the development of RNAi based pesticides: new opportunities and environmental biosafety considerations. This included discussion of some of the novel approaches to screening insect pests for target genes, formulation and application. The efficacy and potential of a new dsRNA insecticide was described and general environmental biosafety issues associated dsRNA were discussed.

Athanasios Dalakouras presented a review of Webinar 9, which discussed Plant regulation - epigenetic and development. This included presentations on RNA-directed DNA methylation as a tool to modify plant epigenetics and Epigenetic modifications: an unexplored facet of exogenous RNA application in plants. There was also a presentation on Application strategies for exo-RNAi induction and finally presentations **on** Emerging roles for small RNAs in plant somatic embryogenesis and the role of RNAi machinery in viroid and viral satellite infections.

Elena Baraldi presented a review of webinar 5 on RNAi-based control of fungal pathogens. In this webinar, speakers discussed the cross talk between plants and

pathogens and presented a review of fungal disease control and studies of control of post bloom flower drop in citrus and botrytis in fruit crops. Studies of the efficiency and activity of dsRNA sprays to control fungal diseases were also discussed .

Olivier Christiaens reviewed Webinar 6 on Strategies to control insect pests. There was an introductory presentation on Mechanisms limiting the efficiency of RNA interference in insects followed by discussions on alternatively structured dsRNAs entering insect cells using different uptake mechanisms and research insights into delivering long dsRNA to plant tissues for insect control. There were 3 presentations on studies of particular target insects: lepidoptera, Colorado potato beetle and stink bug.

Jeremy Sweet introduced the newly published book “RNAi for Crop Improvement and Protection” edited by Bruno Mezzetti, Jeremy Sweet and Lorenzo Burgos and containing 16 chapters written by members of the iPlanta COST Action.

Bruno Mezzetti introduced and displayed a multimedia video entitled Is RNAi a Green Technology describing RNAi technologies, their use and biosafety.

Guy Smagghe working group 1 leader started a discussion on communication on RNAi and introduced Thomas Crampton and Rob Blackie of GreenLight Biosciences who presented a session on How to talk about RNA and agriculture so that people understand it. Results from research on public understanding of RNA. This led to considerable discussion.

Salvatore Arpaia working group 3 leader reviewed Webinar 2 on **Biosafety of RNAi pesticides** where considerable information had come from studies of plant expressed dsRNA. This webinar included presentations on the selection of non-target organisms considering the receiving environment, uptake mechanisms and susceptibility and the role of bioinformatics in identifying specificity, offtargets and nontargets. Environmental persistence was reviewed considering studies of plant expressed dsRNA and methods of application in relation to plant uptake and systemic activity in plants were discussed.

Antje Dietz Pfeilstetter discussed webinar 3 on **RNAi based pesticides: Regulation issues**. This included a presentation on the Specific Issues of RNAi Pesticides identified in the OECD report on Considerations for the Environmental Risk Assessment of the Application of Sprayed or Externally Applied ds-RNA-Based Pesticides. This was followed by presentations discussing the regulatory position of RNAi products in the EU and in USA. Currently the EU is not developing regulations on RNA based pesticides whereas USA and Canada have regulations in place. Speakers from two biotech companies presented their perspectives on regulations and a general discussion followed.

Hilde-Gunn Opsahl Sorteberg working group 5 leader of described Webinar 7 which discussed **Communication strategies on RNAi impacts in agriculture**. This webinar considered communication of scientific information and evidence to different sectors of society and the strategies for trying to present complex scientific issues in unbiased and comprehensible ways. Biotechnology used to develop food supply chains creates concerns for people with traditional views of food production and consumption as well as health concerns. Speakers considered these issues as well as the strategies used by anti-biotech organisations to improve the impact of their messages. Examples of media and improved language for communication were presented.

Vera Ventura, Chair of the WG4 described webinar 8: **The Contribution of RNAi for more sustainable and resilient food systems**. This webinar was in two sessions with the first part engaging with stakeholders and the second session with policymakers. The stakeholders included growers organisations and those developing new products who expressed the need for new products to support their industries and appropriate approval mechanisms to facilitate this, while at the same time considering market and end users demands and concerns. In the second session speakers from EC, FAO, EFSA and PRIMA discussed the environmental, food safety and food security frameworks that set the parameters for new biotech innovations in agriculture and the challenges for achieving global sustainability goals for future agriculture.

Ralph Scorza described webinar 4 on: **Honey Sweet: a RNAi based PPV resistant plum**. This webinar described the production of the GM plum, the field trial and quality test results, the data required for EU regulatory approval and issues concerning the EU regulatory process. This will be the first application for commercial approval for environmental release for many years in the EU and the first application for a GM woody perennial species.

Huw Jones Leader of Working Group 2, introduced Toby Bruce, Professor of Insect Chemical Ecology, Keele University UK who gave a presentation on **New opportunities reduce vulnerability of crops to pests** and this led to a general discussion: Future vision on RNAi technology in Sustainable agriculture .

Bruno Mezzetti closed the conference by thanking all webinar organisers and participants.

### **Programme:**

**Opening Speaker:** Bruno Mezzetti

**Development of RNAi based pesticides: new opportunities and environmental biosafety considerations**

Speaker: Jeremy Sweet

**RNAi plant epigenetics and development**

Speaker: Athanasios Dalakouras

**RNAi-based control of fungal pathogens**

Speaker: Elena Baraldi

**RNAi strategy to control insect pests**

Speaker: Olivier Christiaens

## **Book – Videos presentation**

### **General discussion: Priority area of research for RNAi technology**

Chair: Guy Smagghe: How to talk about RNA and agriculture so that people understand it. Results from research on public understanding of RNA. Speakers: Thomas Crampton, Rob Blackie - GreenLight Biosciences

### **RNAi based pesticides: Environmental biosafety issues**

Speaker: Salvatore Arpaia

### **RNAi based pesticides: Regulation issues**

Speaker: Antje Dietz Pfeilstetter

### **Communication strategies on RNAi impacts in agriculture**

Speaker: Hilde-Gunn Opsahl Sorteberg

### **The Contribution of RNAi for more sustainable and resilient food systems: Meeting with stakeholders and policymakers**

Speaker: Vera Ventura

### **Honey Sweet: a RNAi based PPV resistant plum**

Speaker: Ralph Scorza

### **General discussion: Future vision on RNAi technology in Sustainable agriculture**

Chair: Huw Jones | Title: New opportunities reduce vulnerability of crops to pests  
Speaker: Toby Bruce, Professor of Insect Chemical Ecology, Keele University UK.

The webinar was attended by 190 participants in the morning and 79 in the afternoon.

The video of the meeting, the presentations and the report can be found at the following links:



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<https://www.iplantawebinars.com/event/5fe1f53852a27f1f072d3037>

<https://iplanta.univpm.it/node/88>