

IPM-4-CITRUS



IPM-4-Citrus Final Meeting

Monday 19th December 2022

Les Laboratoires MEDIS,
Nabeul, Tunisia



This project has been funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 734921.

Dr Luc FILLAUDEAU (TBI / IPM-4-Citrus)

Dr Lassaad BOUJBEL (MEDIS Group) & Mr Hafiz BOUJBEL (MédiS Santé Végétale)

IPM-4-Citrus Consortium

Invited representatives from Tunisia, France and European community

Toulouse, 1 December 2022

Subject: IPM-4-CITRUS Final Meeting (19/12/2022, Nabeul, @Les Laboratoires MEDIS)

Ref: Call H2020-MSCA-RISE-2016 – EU project n°734921

Attachment: Flyer and Program (FM and Satellite session)

Dear Madam, Dear Sir,

On behalf of IPM-4-Citrus consortium and MEDIS Group, we are pleased to invite you to participate to final meeting of IPM-4-CITRUS project (<https://www.ipm-4-citrus.insa-toulouse.fr/>). This event will take place at Les Laboratoires MEDIS (Monday 19/12/2022) and will be associated with IDB2022 (Tuesday 20/12/2022) following attached program:

- ✓ on **Monday 19th December 2022** from **9h00 up to 17h00**
(Final Meeting, @Les Laboratoires MEDIS, Nabeul)
- ✓ on **Tuesday 20th December 2022** from **9h30 up to 12h30**
(satellite session IPM-4-Citrus, @IDB2022, Hammamet)

This final event will be the final milestone and the opportunity to gather consortium members, institutional representative from Tunisia, France and Europe Community, in order to close IPM-4-Citrus project, as well as to discuss with media, to promote our main scientific results and to explain the next steps of our collaboration.

Our progress indicators and main results will be introduced on Monday morning 19th December 2022 (9h00-13h00) at Les laboratoires Medis. This event will be associated with the inauguration of production unit "MEDIS Santé Végétale". In addition, if you are available, an overview of scientific results from WP2, 3 and 4 will specifically be introduced during the satellite session "IPM-4-Citrus" during congress IDB2022 (Tuesday 20th December, 2022 – 9h30-12h00).

Looking forward to seeing you, we would like to thank you in advance for attending this closing event. In the meantime, please feel free to confirm your participation at your convenience (luc.fillaudeau@insa-toulouse.fr and nadia.bensaid@labomedis.com) or to contact us for any further information you may need.

Kind Regards,

Dr Lassaad BOUJBEL
General Manager
MEDIS Group

Mr Hafiz BOUJBEL,
General Manager
MédiS Santé Végétale

Dr Luc FILLAUDEAU
INRAE Research director / TBI
IPM-4-Citrus project coordinator



©Fillaudeau L (TBI), Rouis S. (CBS), Kallassy M (USJ)

Innovative approach to Integrated Pest Management for Citrus (IPM-4-Citrus)



Read more

Segura Monroy T. *et al.*

Dynamic model of d-endotoxin and spore productions by three *Bacillus thuringiensis ssp. kurstaki* strains

Processes . 2021

<https://doi.org/10.3390/pr9122147>

Partnerships

- Germany : JKI
- Italy : BIPCA (Private)
- Lebanon : USJ
- Turkey: BIYANS (Private)
- Tunisia: CTA, CBS, IPT, WIKI (Private), MEDIS (private)

Contacts

Luc Fillaudeau, César Arturo Aceves Lara and Julien Cescut

UMR TBI and TWB

luc.fillaudeau@insa-toulouse.fr

aceves@insa-toulouse.fr

julien.cescut@inrae.fr



Context

The IPM-4-Citrus project takes a multidisciplinary approach (biotechnology, bioactivity and transfer) in order to i) develop bioprocesses for a circular bioeconomy and ii) study and manage changes in scale in biotechnology. It aims to develop two new biopesticides (delta-endotoxins produced by the BLB1 and LIP strains of *Bacillus thuringiensis ssp. kurstaki*) that are active against citrus pests (*Phyllocnistis citrella*, *Prays citri*). Bt is an important industrial microorganism for the global biopesticide market. Modelling tools are crucial for evaluating and comparing the potential of endemic Tunisian (*Btk* BLB1) and Lebanese (*Btk* LIP) strains. Optimising bioproduction and obtaining exploitable formulated bioproducts pose scientific and technological challenges.

Results

The dynamic optimisation of the production of proteins (including endotoxins), cells and spores during the different bioproduction phases requires the use of robust models coupled with control strategies. Two models have been proposed to describe protein and spore production by *Bacillus thuringiensis ssp. kurstaki* LIP. The calibration of the models allowed researchers to calculate the kinetic parameters and was well fitted with the experimental data set.

The results showed that optimisation based on a model control strategy (MCS) maximised protein and spore productivity. The simulations were performed with *Bacillus thuringiensis ssp. kurstaki* HD1, LIP and BLB1 under different experimental conditions (complex environment) in order to prove their robustness. Experimental validation of the control law was carried out to demonstrate the accuracy of the protein and spore productivities.

Future outlook

By validating the efficacy of the formulations obtained through laboratory and field tests, the project has paved the way for potential commercial exploitation of these new biopesticides. Scaling up, integrating industrial production and formulating a cost-effective product are currently the most important challenges to tackle. The MEDIS laboratories are developing a plant (Nabeul, Tunisia) to produce formulations of *Btk*-based biological control agents for citrus following the results and expertise of the IPM-4-Citrus consortium. They are targeting the Middle East and North Africa (MENA) markets by 2023.

IPM-4-CITRUS



From Research
From Lab

...to Market
...to Field

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IPM-4-CITRUS - H2020-MSCA-RISE-2016 Project n°734921 - April 2017-Jan 2023

FINAL MEETING & IDB 2022 - 19th & 20th December 2022 -

AGENDA

Monday 19th December 2022 @Les Laboratoires MEDIS (Nabeul, Tunisia)

- 8h30 Arrival & Registration
- 9h00 **Welcome forewords** by MEDIS and IPM-4-Citrus coordinators
Introduction of official representatives
- 9h05 IPM-4-Citrus project: Aims & Context
Les Laboratoires MEDIS, business corporate presentation
- 9h15 **Overview and state point** about our achievement and perspectives
WP1 Management (main indicators, history, funding and human resources, actions, reporting: deliverables overview), WP5 Networking & Outreach activities (events, consortium meeting, training, workshop and Round table) and WP6 Dissemination & Exploitation (scientific valorization, social and economic impact)
- 10h00 **Focus on Scientific and technical Work Packages:** WP2 Bioprocess, WP3 Formulation & Biocontrol activity and WP4 Transfer & economic maturation (3x15min).
Coffee break (15min)
- 11h00 **Exchanges with officials and audience:** Question/Answer
- 11h15 Presentation of "MEDIS Santé végétale", from concept to production capacity
- 11h30 **Visit of production unit**

Lunch (buffet on site)

- 14h00 **Inauguration of production unit** (media, civil society and stakeholder: project overview, production unit and local impact)
- 14h15 **Poster session:** scientific and technical exchanges with audience
Press briefing (for media with consortium scientists)
Coffee break (15min)
- 15h15 **Round tables** (2 x 20min)
Theme 1: Technology transfer as a driver for the development of the Tunisian economy (scientific point of view, industrial point of view)
Theme 2: Perception of biopesticides by the civil society (synthesis of the "survey". What about your opinion?)

Tuesday 20th December 2022 @IDB2022 (Hammamet, Tunisia)

- 9h30 **Satellite session IPM-4-Citrus** – (open session / 2h30+coffee break)