

## COST Action CA16107

# "EuroXanth: Integrating science on *Xanthomonadaceae* for integrated plant disease management in Europe"


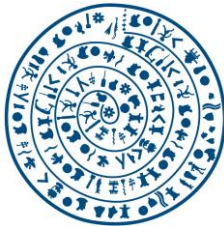

## Program of the 1<sup>st</sup> Training School

# on “Prognosis & Advanced Diagnosis of *Xanthomonadaceae*”

Heraklion - Crete, Greece

**February 12-16, 2018**

### ORGANISERS

		
<b>Technological Educational Institute of Crete – (TEI Crete) University of Applied Sciences Crete – (UASC)</b>	<b>Foundation for Research and Technology - Hellas (FORTH)</b>	<b>University of Crete (UoC)</b>
Department of Agriculture	<ul style="list-style-type: none"><li>• -Institute of Molecular Biology &amp; Biotechnology,</li><li>• -Institute of Computer Science,</li><li>• Institute of Electronic Structure &amp; Laser</li></ul>	Department of Biology

### SPONSORS

**Proactive ΑΕ** (<http://proactive.com.gr/>)

**Technological & Educational Institute of Crete**

(<https://www.teicrete.gr/mscagro/en>, <https://teicrete.gr/en>)

**Region of Crete** (<http://www.crete.gov.gr/>)

**Municipality of Heraklion** (<https://www.heraklion.gr/en>)

 **Proactive A.E.**  
Σύμβουλοι Επιχειρήσεων

 **TEI of Crete**  
Technological Educational Institute of Crete

 **ΠΕΡΙΦΕΡΕΙΑ ΚΡΗΤΗΣ**  
REGION OF CRETE

 **MUNICIPALITY OF HERAKLION**

**Day 1: Monday, 12<sup>th</sup> February 2018**

(Place: TEI Crete, School of Health and Welfare Services (SEYP) Building @ the Conference Room)

Shuttle bus from Hotel “LATO” - Heraklion to “Agroktima - Agricultural Farm” of TEI Crete / UASC leaves @ 08.00 am

**Theory – Preparatory steps for “Hands on” experience – Introduction to Prognosis (*Know thyself*)**

Time	Subject
08:30 – 10:00	<b>Introduction / Orientation:</b> Self-presentation of all Trainers and Trainees (3min max/ person) <i>Coordinators:</i> Prof. F. Ververidis (Head Organizer), Dr. R. Koebnik (EuroXanth Coordinator)
10:00 – 11:00	<b>Classification of the genus <i>Xanthomonas</i>: species and pathovars</b> <i>Instructor:</i> Dr. Jacques (France)
11:00 – 11:30	<b>Coffee Break</b>
11:30 – 12:30	<b><i>Xanthomonas</i>: plant diseases symptomatology, regulated organisms (EPPO Lists, EU Directive)</b> <i>Instructor:</i> Prof. Catara (Italy), Prof. Goumas (Greece)
12:30 – 13:30	<b>Classification of the genus <i>Xylella</i>: species and subspecies / hosts / symptoms</b> <i>Instructor:</i> Dr. Jacques (France)
13:30 – 14:30	<b>Lunch Break</b>
14:30 – 15:30	<b>Current detection methods for <i>Xylella fastidiosa</i></b> <i>Instructor:</i> Dr. Dreo (Slovenia)
15:30 – 16:30	<b><i>Hands-on: selected Xanthomonas species/ strains</i></b> <b>Short visit to greenhouses for an introduction to symptomatology caused by different xanthomonads on various crops (artificial inoculations)</b> <i>Instructors:</i> Dr. Holeva, Prof. Goumas (Greece)
16:30 - 17:00	<b>Coffee Break</b>
17:00– 18:00	<b>Sample collection from infected material (artificially infected plants, etc.)</b> <b>Isolation from leaves/seeds (choice of isolation-media, techniques)</b> <i>Instructors:</i> Prof. Goumas, Dr. Trantas, Ms. Mpalantinaki, Ms. Pagoulatou (Greece)
18:00 - 19.30	<b>Isolation plates, picking, purification (pure cultures for characterization, pathogenicity tests (Koch’s post.), DNA preparation)</b> <b>Crude plant-extracts can be used for a specific PCR detection method</b> <i>Instructors:</i> Prof. Goumas, Dr. Trantas, Ms. Mpalantinaki, Ms. Pagoulatou (Greece)

Shuttle bus from “Agroktima - Agricultural Farm” of TEI Crete / UASC to Heraklion @ 19.40

Day 2: Tuesday, 13<sup>th</sup> February 2018

(Place: TEI Crete, School of Health and Welfare Services (SEYP) Building @ the Conference Room)

Shuttle bus from Hotel “LATO” - Heraklion to “Agroktima - Agricultural Farm” of TEI Crete / UASC leaves @ 08.00 am

**How to properly prepare samples from my infected tissues – “Hands on” experience**

Time	Subject
08:30 – 09:30	<b>Brief introduction to currently available diagnostic techniques to certified governmental labs to handle quarantine bacteria of <i>Xanthomonadaceae</i> in Greece</b> Dr. Holeva, Prof. Goumas (Greece)
09:30 – 10:30	<b>Tips &amp; tricks for performing official diagnostic protocols for regulated plant pathogenic <i>Xanthomonas</i></b> Instructor: Prof. Catara (Italy)
10:30– 11:00	<b>Coffee Break</b>
11:00 – 12:00	<b>Evolutionary histories of xanthomonads and their pathogenicity factors</b> Instructor: Dr. Jacques (France)
12:00 – 13.00	<b>Latest updates on <i>Xylella fastidiosa</i> epidemic in Italy</b> Instructor: Dr. Massimiliano Morelli (Italy)
13:00 – 14:00	<b>Lunch Break</b>
14:00 – 15:00	<b>Molecular typing in the context of plant pathology: from fingerprints to VNTRs</b> Instructor: Dr. Koebnik (France)
15.00 – 16.00	<b>VNTRs – How to identify them in genome sequences and how to develop primers (design pipeline and websites) – Computer exercises</b> Instructor: Dr. Koebnik (France)
16:00 - 16:30	<b>Coffee Break</b>
16:30– 18:00	<b>What can you can with the generated data? Tools and databases for molecular typing (Phylogeny.fr, PubMLST, PAMDB, MLVAbank) – Computer exercises</b> Instructor: Dr. Koebnik (France)
18:00 – 19:00	<b>Pathogenicity tests (inoculation techniques)</b> <b>Molecular techniques: Pure cultures (DNA prep or boiled cells) + specific PCR on crude extracts</b> Instructor: Prof. Catara (Italy), Dr. Sarris, Prof. Goumas (Greece)

Shuttle bus from “Agroktima - Agricultural Farm” of TEI Crete / UASC to Hotel “LATO” -Heraklion @ 19.15

21:00	<i>Training School Welcome Reception at</i> <b>HOTEL LATO “BRILLANT RESTAURANT”</b> (nouvelle Grecque cuisine- gourmet kitchen, <a href="https://www.lato.gr/brillant-restaurant">https://www.lato.gr/brillant-restaurant</a> )
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Day 3: Wednesday, 14<sup>th</sup> February 2018

(Place: TEI Crete, School of Health and Welfare Services (SEYP) Building @ the Conference Room)

Shuttle bus from Hotel “LATO” - Heraklion to “Agroktima - Agricultural Farm” of TEI Crete / UASC leaves @ 08.15am

**Private Companies / Demonstration and “Hands on” experience**

Time	Subject
<b>Presentation of new diagnostic commercial tools PART (A)</b> – <b>Rapid detection of plant pathogens using isothermal amplification techniques</b> (Dedicated to AGDIA's AmplifyRP testing platform. It uses Recombinase Polymerase Amplification (RPA), a patented isothermal amplification technology that enables highly specific and sensitive DNA or RNA analysis of plant pathogens in any type of testing environment. <a href="http://www.agdia-biofords.com">http://www.agdia-biofords.com</a> )	
08:30-09:00	<b>Rapid detection tools – From serological to molecular techniques</b> Instructor: Dr. Amato (AGDIA Inc, Managing Director)
09:00-09:45	<b>Recombinase Polymerase Amplification (RPA) and its applications in plant pathogen detection – Focus on Detection techniques for <i>Xylella fastidiosa</i></b> Instructor: Dr. Amato (AGDIA Inc, Managing Director)
09:45-10:00	<b>Coffee Break</b>
10.00- 12.00	<b>Hands on detection of <i>Xylella fastidiosa</i> with Agdia AmplifyRP®</b> Instructor: Dr. Amato (AGDIA Inc, Managing Director)
12.00-13.00	<b>Lunch Break</b>
<b>Presentation of new diagnostic commercial tools PART (B)</b> – <b>Diagnostic tools with bead-coupled spoligotyping system</b> (Dedicated to BEAMEDEX with particular focus on the detection and typing of the quarantine pathogen such as <i>Xanthomonas citri</i> and/or <i>Xanthomonas oryzae</i> . <a href="https://www.beamedex.com">https://www.beamedex.com</a> )	
13.00-14.00	<b>Presentation of the BEAMEDEX company, its know-how, products and expertises</b> Instructors: Dr. Ripoll and Dr. Gomgnimbou (BEAMEDEX, France) The Luminex platform : history, principles, evolution The IGEPE and Beamedex start-up : history, assays development, expertises and services, perspectives
14.00-15.00	<b>Introduction of the concept of spoligotyping and approaches on how to perform the analysis and how to interpret the data</b> Instructors: Dr. Ripoll and Dr. Gomgnimbou (BEAMEDEX, France) -Running a spoligotyping assay : theory, steps, post-experience data processing, results interpretation -Pitfalls, troubleshooting, towards more complex SNPs based assays: allele call procedures
15.00-15.30	<b>Coffee Break</b>
15.30-18.30	<b>On-site demonstration of the technology on human/plant pathogen samples (DNA).</b> (A) Hybridization on beads, -detection on MagPix, (B) Raw results transformation into xls macros, (C) Transforming data into knowledge using databases and clustering analysis Instructors: Dr. Ripoll and Dr. Gomgnimbou (BEAMEDEX, France)
18.30-19.30	<b>How to develop a new assay (technically, juridically, time frame, etc.)?</b> (A) Prerequisites genomic analysis, (B) In progress models: timeframe, method, requirements, participants Instructors: Dr. Ripoll and Dr. Gomgnimbou (BEAMEDEX, France)

Shuttle bus from “Agroktima - Agricultural Farm” of TEI Crete / UASC to Heraklion @ 19.45

21:00	<b>Training School Dinner at “MERASTRI TAVERN” (Cretan delicacies - gourmet kitchen)</b>
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Day 4: Thursday, 15<sup>th</sup> February 2018

(Place: ITE – FORTH, Room # 1”, @ the 1<sup>st</sup> Floor)

Shuttle bus from Hotel “LATO” - Heraklion to “KORONEKES” EVOO Mill factory, leaves @ 08.30 am

**Genome sequencing techniques, as tools for diagnosis / Demonstration**

Time	Subject
09:00 – 13:30	© Visit at “KORONEKES” Commercial COLD EXTRACTED Extra Virgin Olive Oil (EVOO) Mill Factory ( <a href="http://koronekes.gr/">http://koronekes.gr/</a> ) – ©Extra virgin olive oil tasting© © Visit at “DOMAIN PATERIANAKIS” winery of organic wines <a href="http://www.paterianakis.gr">http://www.paterianakis.gr</a>
13:30 – 14:30	<b>Lunch Break</b>
14:30 – 15:30	<b>Development of integrated diagnostic tools for pathogen detection in plants and food samples</b> <b><i>Theoretical Demonstration</i></b> Instructors: Prof. Electra Gizeli (Greece)
15:30 – 16:30	<b>Introduction to microbial communities – Analysis tools – Interconnection to Xanthomonadaceae</b> Instructor: Ass. Prof. Ladoukakis (Greece)
16:30-17:00	<b>Coffee Break</b>
17:00-18.00	<b>Concentration and Environmental distribution has possible sampling bias for detection methods</b> Instructor: Dr. Joana Costa (Portugal)
18:00 – 19.00	<b>Genome sequencing techniques for microbial genome sequencing</b> <b><i>Theoretical Demonstration - A</i></b> Instructors: Dr Pantelis Topalis (Greece)

Shuttle bus from “ITE-FORTH” Crete to Hotel “LATO” -Heraklion @ 19.15

**Day 5: Friday, 16<sup>th</sup> February 2018**

(Place: ITE – FORTH, Room “Pagiatakis”, @ the 1<sup>st</sup> Floor)

Shuttle bus from Hotel “LATO” - Heraklion to “ITE-FORTH” Crete leaves @ 08.30 am

**Bioinformatics and Imaging techniques – Analysis of NGS data from *Xanthomonadaceae* samples  
/ Demonstration and “Hands on” experience**

<b>Time</b>	<b>Subject</b>
09:00 – 10:00	<b>Introductory seminar to phylogenetics and population genomics methods</b> <i>Instructors: Dr. P. Pavlidis, Ass. Prof. Ladoukakis (Greece)</i>
10:00 – 11:00	<b>Genome sequencing techniques for population genomics and phylogeny</b> <b><u>Theoretical Demonstration - B</u></b> <i>Instructors: Dr. Pavlidis, Ass. Prof. Ladoukakis (Greece)</i>
11:00 – 11:15	<b><i>Coffee Break</i></b>
11.15 – 12.30	<b>Introduction to diagnostic imaging techniques for detecting microbial communities in plants</b> <i>Instructors: Dr. Zacharakis, Dr. Tserevelakis (Greece)</i>
12:30 – 13:30	<b><i>Lunch Break</i></b>
13.30 - 16.00	<b>“Hands on” preparing the samples for specific imaging</b> <i>Instructors: Dr. Zacharakis, Dr. Tserevelakis, Dr. Trantas, Dr Sarris (Greece)</i>
16.00 - 17.00	<b>Closing Session – Evaluation comments of Trainees to the whole event of Training School – Happy Hour</b> <i>Coordinators: Dr Ralf Koebnik, Prof. Filippos Ververidis</i>
<b><u>END OF THE 1<sup>ST</sup> EUROXANTH TRAINING SCHOOL</u></b>	

Shuttle bus from “ITE-FORTH” Crete to Hotel “LATO” -Heraklion @ 17.15

## **THE ORGANIZING COMMITTEE.**

### *Local Instructors / Trainers:*

1. **GIZELI Electra, Professor.** [Clinical diagnostics, Biophysics and Integrated Structures (lab-on-chip)], Institute of Molecular Biology & Biotechnology-FORTH, Crete (IMBB-FORTH) & Department of Biology, University of Crete,  
[gizeli@imbb.forth.gr](mailto:gizeli@imbb.forth.gr),  
<http://www.imbb.forth.gr/en/research-en/nanobiotechnology/item/65-electra-gizeli>
2. **GOUMAS, Dimitrios, Professor.** [Plant pathologist, Bacteriologist, Expert on *Xanthomonas*], Department of Agriculture, TEI Crete / UASC,  
[dgoumas@staff.teicrete.gr](mailto:dgoumas@staff.teicrete.gr),  
<https://www.teicrete.gr/mscagro/en/%CF%85%CF%80%CE%BF%CF%83%CE%B5%CE%BB%CE%AF%CE%B4%CE%B5%CF%82/dimitrios-goumas>
3. **LADOUKAKIS, Emmanuel, Assistant Professor.** [Molecular & Population Genetics], Department of Biology, University of Crete  
[ladoukakis@biology.uoc.gr](mailto:ladoukakis@biology.uoc.gr),  
<http://www.biology.uoc.gr/en/personnel/ladoukakis-emmanuel>
4. **PAVLIDIS, Pavlos, Senior Researcher.** [Bioinformatics], Institute of Computer Science, ICS-FORTH,  
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[http://www.ics.forth.gr/cbml/index\\_main.php?l=g&c=723](http://www.ics.forth.gr/cbml/index_main.php?l=g&c=723)
5. **SARRIS, Panagiotis, Associate Professor.** [Molecular diagnostics, Plant innate immunity, Plant-Pathogen Interactions], Institute of Molecular Biology & Biotechnology-FORTH, Crete (IMBB-FORTH) & University of Exeter, School of Life and Environmental Sciences, UK),  
[p.sarris@imbb.forth.gr](mailto:p.sarris@imbb.forth.gr),  
<http://www.imbb.forth.gr/imbb-people/el/sarris-members/item/2695-dr-panagiotis-f-sarris>
6. **TOPALIS Pantelis, Senior Researcher.** [Bioinformatics], Institute of Molecular Biology & Biotechnology-FORTH (IMBB-FORTH),  
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<http://www.imbb.forth.gr/imbb-people/el/bioinformatics-support-group-members/item/2437-pantelis-topalis>
7. **TRANTAS, Emmanuel, Researcher.** [Molecular Diagnostics of Plant Pathogens], Department of Agriculture, TEI Crete / UASC,  
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8. **TSEREVELAKIS, George Researcher.** (Physicist, Engineer on Laser optics, Non-invasive diagnostic imaging methods of pathogen detection), Institute of Electronic Structure and Laser, IESL-FORTH,  
[tserevel@iesl.forth.gr](mailto:tserevel@iesl.forth.gr),  
<https://forth.academia.edu/GeorgeTserevelakis>
9. **VERVERIDIS, Filippos, Professor.** [Plant Biochemistry & Biotechnology, Metabolic engineering of natural bioactive substances as plant protective tools], Department of Agriculture, TEI Crete / UASC,  
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10. **ZACHARAKIS, Ioannis, Senior Researcher.** [Physicist, Engineer on Laser optics, Non-invasive diagnostic imaging methods of pathogen detection], Institute of Electronic Structure and Laser, IESL-FORTH,

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<http://www.iesl.forth.gr/people/person.aspx?Id=54>

## **EXTERNAL INSTRUCTORS / TRAINERS**

*EuroXanth COST members:*

11. **CATARA, Vittoria, Professor.** [Plant Pathology], University of Catania, Department of Agriculture, Food and Environment, Catania, Italy,  
[vcatara@unict.it](mailto:vcatara@unict.it),  
<http://www.di3a.unict.it/docenti/vittoria.catara>
12. **COSTA, Joana, Senior Researcher.** [Phytopatology; Characterization and valorization of natural resources; Microbiota], FitoLab, Phytosanitary Laboratory, Instituto Pedro Nunes, Coimbra, Portugal,  
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13. **DREO, Tanja, Senior Researcher.** [Biotechnology and Systems Biology], National Institute of Biology, Department of Biotechnology and Systems Biology, Ljubljana, Slovenia,  
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<http://www.nib.si/component/directory/?Itemid=12&view=details&id=76>
14. **HOLEVA, Maria, Senior Researcher.** [Plant pathologist, Bacteriologist,], Benaki Phytopathological Institute, Department of Phytopathology, Laboratory of Bacteriology, Athens,  
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15. **JACQUES, Marie-Agnés, Senior Researcher.** [Microbial ecology, plant pathology], Institut de Recherche en Horticulture et Semences, French National Institute for Agricultural Research, Angers, France,  
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<https://www6.angers-nantes.inra.fr/irhs/Contacts-et-Plan-d-acces/Annuaire-du-personnel/Jacques>
16. **KOEBNIK, Ralf, Senior Researcher.** [Comparative genomics and transcriptomics of xanthomonads], Institut de Recherche pour le Développement, Interactions Plants Microorganisms Environment, Montpellier, France,  
[ralf.koebnik@ird.fr](mailto:ralf.koebnik@ird.fr),  
<http://umr-ipme.ird.fr/annuaire/ralf-koebnik>

## **PRIVATE COMPANIES**

*Related to Diagnostics of Xanthomonadaceae*

1. **AMATO, Marcos, Dr., Managing Director, AGDIA** Company representative (RTD Organisation) Developments on molecular diagnostics on *Xanthomonadaceae*,  
[marcos.amato@agdia-emea.com](mailto:marcos.amato@agdia-emea.com),  
<https://orders.agdia.com/products>
2. **RIPOLL, Clement, Dr.** [BEAMEDEX, CEO], and **GOMGNIMBOU Kireopori Dr.** [BEAMEDEX, President], **BEAMEDEX:** Company representatives (RTD Organisation) Developments on molecular diagnostics on *Xanthomonadaceae*,  
[clementripoll@yahoo.fr](mailto:clementripoll@yahoo.fr),  
<https://www.beamedex.com/products-and-services/>







This Training School is based upon work from COST Action CA16107 EuroXanth, supported by COST (European Cooperation in Science and Technology).

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