COST Action CA16107
EuroXanth: integrating science on *Xanthomonadaceae* for integrated plant disease management in Europe

Minutes on the CRISPR Typing Workshop

Paris, France, 3 April 2018

Minutes on the CRISPR Typing Workshop written by Ralf Koebnik and reviewed by all participants

External attendees: Vittoria Catara (IT, Vice Chair, WG3), Joana Costa (PT, WG1 Leader), Tanja Dreo (SI, MC Member, WG1), Ralf Koebnik (FR, Action Chair, WG2), Joël F. Pothier (CH, WG2 Leader), Mariya Stoyanova (BG, MC Member, WG4)

Instructors: Christophe Sola (FR, Professor, University Paris-Sud), Clément Ripoll (FR, General Director of SAS Beamedex® SAS), Guislaine Refrégier (FR, Assistant Professor, University Paris-Sud), Bernice Klotoe (FR, PhD student with SAS Beamedex® SAS)

On the 3th of April at 9:00 am in Paris-Orsay (France), a workshop on "Theoretical and Practical Aspects of CRISPR Typing: Application to Plant-Pathogenic Xanthomonads" was organised. Six external scientists (67% female, 50% ITC members) working in the field of *Xanthomonadaceae*, with activities in diagnostics and/or biocontrol, took part in this one-day workshop. The goals of this workshop were to familiarize with the principles of CRISPR-based molecular typing, to follow the on-site demonstration of the Luminex® technology used by the SME Beamedex®, and to discuss theoretical and practical aspects of CRISPR typing and its application to plant-pathogenic xanthomonads, which are of specific interest to Working Group WG1 (Diagnostics & Diversity – Population Structure). Representatives of all four Working Groups were present to evaluate the potential of this approach to achieve the EuroXanth objectives and its tangible deliverables, such as:

- Deliverable 6 "List of molecular markers useful to study the genetic diversity and population structure of plant-associated *Xanthomonadaceae*" due at month 24;
- Deliverable 7 "Curated, internet-accessible database for molecular typing of plant-associated *Xanthomonadaceae* essentially for epidemiological purposes" due at month 24.

After a welcoming and quick opening by the local organisers, Christophe Sola and Clément Ripoll, all attendees were asked to introduce themselves briefly. Then, participants presented and discussed their work:

- Clément Ripoll: Presentation of Beamedex® SAS company: core know-how and business, potential R&D activities, flow-through of new method development, technical aspects of Luminex® technology;
- Christophe Sola: Aspects of method development, data mining of sequencing results, approaches to decrease complexity using Sipina® and/or Weka®, elaboration of accurate classifiers;

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- Guislaine Refrégier: Interpretation of raw results, determination of cut-offs, design of positive controls, introduction to TB-miner;
- Joël Pothier: Lessons from CRISPR-based typing of *Erwinia amylovora* and *Xanthomonas fragariae*;
- Ralf Koebnik: First results with CRISPR-based typing of *Xanthomonas citri* pv. *citri* and *Xanthomonas oryzae* pv. *oryzae*;
- Christophe Sola: What you need to know to develop and interpret your CRISPR-based method: molecular biology requirements, details of spoligotyping and CRISPOL, data analysis using different distance methods.

In the afternoon, Christophe Sola and Bernice Klotoe presented the different platforms for CRISPR-based typing at Beamedex®, such as the Luminex® 200 and MagPix® devices, followed by a practical demonstration with samples of *Salmonella enterica*.

All day was characterized by lively discussions, not only targeting specific technological aspects, but also practical aspects of assay development and business aspects (e.g. interest for the European Community, funding options, market volumes, etc.).

A strong cohesive effect among all participants could be clearly perceived throughout the whole workshop, which was finished by a working dinner in a nice atmosphere where future opportunities were evaluated.

Workshop attendees at Beamedex®; the MagPix device can be seen at the right side in the back. From left to right: J. Costa, J. F. Pothier, M. Stoyanova, R. Koebnik, C. Ripoll, C. Sola, V. Catara, and T. Dreo.

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