



## Launching the UK Plant Microbiome Initiative

Wednesday 26 April 2017 : Rothamsted Research, Harpenden

CABI and Rothamsted Research launched the UK Plant Microbiome Initiative at a workshop sponsored by the Society for Applied Microbiology (SfAM). The event was attended by over 30 delegates from a broad range of organisations, including representatives from universities, research institutions, botanic gardens, the farming industry, scientific societies, research councils and funders.

The initiative seeks to exploit the potential of the plant microbiome (the microbial communities surrounding and inside plant systems) and place the UK at the forefront of global research, facilitation and policy. The initiative will facilitate new collaborative projects among stakeholders, drawing on the leading scientific expertise, cutting edge facilities and the infrastructure required to unlock the plant microbiome's potential. Focus will be on enhancing food production by providing microbial solutions to pressures in agricultural production resulting from climate change, decrease in resources and increasing human population.

Prof Penny Hirsch (Rothamsted) opened the event and welcomed delegates to the meeting. Dr Matthew Ryan (CABI) then presented the "The UK Plant Microbiome Initiative – The Proposal", which gave a brief overview of the purpose of the event, explaining that the initiative was one of the outcomes from the Rothamsted Open Innovation Forum (ROIF) which had taken place at the beginning of the year. The question of "open innovation" was raised and it was acknowledged that whilst we needed to be innovative and collaborative, it was important to recognise that at times, discussions needed to be confidential. During discussions, several delegates raised the subject of funding and queried the possibility of the UK joining the existing US initiative. The purpose and goals for the UK initiative were fundamentally different from that of the US. It was therefore considered more important to start at a UK level, with a view to becoming global over time, as this would allow the UK to define its weight as a strategic leader in Agri-tech RD and enterprise.

There was a wide range of other speakers during the morning, including Dr David Dent (CTO, Azotic Technologies) who spoke about industry focus, needs and opportunities. Dr Paul Richards (Microbiology Society) presented an overview on the society's Microbiome policy initiative and covered multi-disciplinary opportunities and challenges. Dr Khalid Mahmood (Rothamsted) gave a brief history of Rothamsted and the "open innovation" approach. Dr Tim Mauchline (Rothamsted) summarised the state of UK research in the Plant Microbiome and summarised Rothamsted's activities in plant and soil microbiome research. Dr Chris Brown (SfAM) gave a short presentation on behalf of our event sponsors on the key activities of the society. All presentations can be made available to delegates upon request.

After lunch, Phil Abrahams (CABI) chaired the round table session *From Concept to Delivery*. The group talked about the current gaps and looked at the immediate priorities for agri-tech. It was considered important to combine industry leads with research needs. The question was raised about the involvement of the UK government in this initiative and whether legislation existed in this area. A suggestion was made that a representative from the HSE should be invited to the next workshop/event to enable them to provide their input. It was recognised that the government is trying to seek views from both the industry and scientific sectors as part of its industrial strategy, but this, of course, might change as a result of the forthcoming election. Debbie Harding (BBSRC) suggested that it might be useful to explore the possibility of developing a POSTnote in the plant microbiome, as this would enable relevant Government officials and politicians to learn the key facts and issues without having to read a long report or attend meetings. Dr Paul Richards (Microbiology Society) reminded delegates that the society is currently writing a report to address this emerging area of science; the report is due to be launched in the autumn and is likely to be included in a forthcoming Soil Microbiome briefing.



Dr Martin Parr (CABI / GODAN) gave a very informative presentation on GODAN – Global Open Data for Agriculture and Nutrition – a secretariat hosted by CABI, the steering group for which was made up of eight significant donors. The key purpose of the GODAN secretariat was to convene, equip and empower. Dr Parr confirmed that GODAN were happy to show support for the UK Plant Microbiome concept.

Following this presentation, the group discussed the four different projects which had been highlighted at the recent ROIF and how these projects might be taken forward:

- Project 1 - Developing an understanding about interactions in the plant microbiome to improve root growth in a key food security crop (e.g. maize) (Lead: Prof Hirsch, Rothamsted)
- Project 2 - Audit and sharing of data relating to the plant microbiome, developing an ontology and scope for meta-analysis. (Open data links through GODAN).
- Project 3 - Development of long read technologies, MinION and meta genomics to enhance understanding of the plant microbiome.
- Project 4 – Developing the physical infrastructure to underpin research in the Plant Microbiome: Conservation of microbial communities and DNA (Lead: Dr Ryan, CABI)

All projects will involve a consortium approach and will include industry stakeholders. One of the biggest concerns for some of the academics was that they lacked contacts with industry. It was therefore acknowledged that part of the role of the secretariat had to be to help forge relationships between academic science and industry.

It was agreed that there were considerable opportunities under Project 1 (lead by Prof Hirsch) which should involve a key biosecurity food crop. In relation to Project 2, Chris Jones (Innovate UK) confirmed that two companies had already been funded by Innovate UK to develop a pipeline which is of relevance. Links with existing facilities such as the European Bioinformatics Institute would be essential. Key outputs would be accessing metagenomic data in an open data environment. It was noted that work had already been started under Project 3 involving CEH, University of Warwick and Rothamsted. Project 4 is important because it will underpin all activity in the Plant Microbiome by providing the essential infrastructure to support R&D. David Dent commented on the importance of resource centres in providing a pipeline for new products. CABI was well placed to lead development of this project as custodians of existing UK national microbial collections and has expertise in cryotechnology. The project will be developed in association with Rothamsted, CEH, JIC and academic/industrial partners. It was agreed to engage in off-line discussions to generate concept notes for all four projects.

The group went on to debate the next steps for establishing the secretariat. It was suggested that a short, two-page business case be drawn up, setting out the secretariat's role, its structure, how it would be funded and where it would be housed. This should be distributed to participants and feedback requested.

The final item on the agenda was the possibility of holding a two-day UK "Plant Microbiome" conference in 2018. It was agreed that a Planning Group should be set up to take this concept forward. Information about the conference could be circulated via the members' newsletters issued by the Microbiology Society and SfAM. Dr Dent mentioned the Microbiome AgBioTech Europe conference which was taking place in London in September (further details to be provided outside of the meeting).

In summary, the group agreed that there should be a UK Plant Microbiome Secretariat. A report from today's event would be circulated to stakeholders and follow-up work would continue outside of the meeting. Participants were also urged to follow developments on the UK Plant Microbiome Twitter feed @PMicrobiome.