Sandpit Meeting Builds Collaboration Workshops

In June 2014, BioProNET held its inaugural event, a so-called 'sandpit' meeting — an event where scientists from different backgrounds come together to discuss challenges and opportunities — that was attended by about 80 delegates, of which about one-third were from industry.

"We felt it that such a meeting was an important way to bring the bioprocessing community together to eek out challenges and key issues," says Mark Smales, BioProNET director. "We included lots of time for discussions between attendees," he highlights.

Key to the success of these discussions was the involvement of two professional facilitators, who were able to maximise interactions and dialogue between attendees, and allow discussions to explore new topics.

The discussions identified several themes that attendees thought could be the focus of follow-on workshops that would build collaborations between industrial and academic scientists.

These where:

- Computational bioprocessing
- Continuous processing
- Biologic production in microalgae and plants
- Analytics and formulation
- Synthetic biology tools for bioprocessing
- Protein authenticity and translation
- Cell-free expression systems
- Whole genome tools
- Cells as tools
- Antibody-drug conjugates

Indeed, eight workshops were funded BioProNET; the outcomes of four were presented at BioProNET 2nd Annual Scientific meeting in 2015.

Attendees at the microalgae and plant expression workshop

Production of pharmaceutical and industrial proteins in microalgae and plants

This workshop was organised by Anil Day (University of Manchester), Jags Pandhal (University of Sheffield) and Yuhong Zhou (University College London) and had attendees from seven universities and six companies, and was jointly funded by Phyconet.

The workshop centred on three themes — expression systems; bioreactors, regulation and industry perspective; harvesting and downstream processing — and featured presentations and breakout sessions. Outcomes included a technology assessment, identification of current barriers to progress, the identification of key academic and industry players from both networks, and the establishment of consortia to take projects forward.

Analytics in bioprocessing and formulation

Organised by Paul Dalby (University College London), Gary Montague (Teeside University) and John Liddell (Fujifilm Diosynth Biotechnologies), this workshop had 17 attendees, over half of which were from industry. The group first identified ten key challenges and then grouped these into three themes, which comprised of non-invasive measurements, automated sample preparation and analysis, and data management and predictability.

As well as a professionally written report of the meeting (available here), other outputs were grant applications to Innovate UK and the EPSRC formulation call.

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Cell-free protein synthesis

This workshop, organised by Karen Polizzi (Imperial College London) and Jose Gutierrez-Marcos (University of Warwick) featured a keynote presentation (available here) by Trevor Hallam, chief scientific officer of Sutro BioPharma in the USA. This was followed by discussions on the challenges for large scale manufacturing with cell-free extracts and the use of different cell types.

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Discussions — such as UK research capabilities and what is best use of technology — on cell free synthesis are continuing and indeed a follow up workshop is being planned for March 2016.

Recombinant protein authenticity

This workshop was organised by Ian Stansfield (University of Aberdeen), Mick Tuite (University of Kent) and Tobias von der Haar (University of Kent). The plenary lecture, entitled 'improving heterologous protein production through synthetic biology algorithms' was given by Manuel Santos, University of Aveiro, Portugal. This was followed by talks and discussions focusing on how the detection and mitigation of mistranslation will provide new routes to optimize recombinant protein expression.

"We established that a collaborative research project between academia and industry in the UK needs to be set up to explore the means of detecting errors in recombinant proteins and designing new error-free expression strategies," says Mick Tuite.