NIBRT Research Day 2017 – *building effective collaborations* View this email in your browser

The “sold out” sign was put up in NIBRT for the Institute’s annual Research Day on Friday November 24th 2017. The theme of this year’s event was building effective collaborations, which was well received by the full house of attendees from major biopharma companies and higher education institutes.
NIBRT CEO, Dominic Carolan, opened proceedings with a summary of NIBRT’s Research Strategy which is focused on “*enhancing product quality and manufacturing productivity*” incorporating four thematic areas including:

- Cell Biology and Engineering led by Prof Niall Barron and Dr Radka Fahey
- Bioanalytics led by Dr Jonathan Bones

- Bioinformatics and Data Analytics led by Dr Colin Clarke
- Advanced Manufacturing led by Prof Mike Butler

The key message was NIBRT has an "*open door*" policy for collaboration with Industry and Academia. Throughout the day NIBRT gave examples of their collaborations of various size and duration with companies including Pfizer, BioMarin, JnJ, MSD, Allergan, Sanofi, Lilly, GE and ThermoFisher involving most of the Higher Education Institutes in Ireland. Speakers highlighted the various funding mechanisms from EI, SFI, IDA and Horizon 2020 to implement such collaborations.
Earlier this year, NIBRT led a consortium of 27 partners to successful win approval-in-principle for the "Bio-Logic" SFI Research Centre, an ambitious €40million 6 year research programme. While government funding for this Centre is not currently available, NIBRT outlined how they are nonetheless proceeding with bilateral projects with interested parties.
NIBRT Principal Investigator, Dr Jonathan Bones kicked-off the scientific presentations and outlined his teams approach to develop "*excellent research to deliver solutions*". Dr Bones's research focus includes taking bioanalytical characterisation analysis to the point of manufacture to facilitate continuous manufacturing. With the increase in complexity of therapeutic molecules such as bi-specifics and ADCs, Dr Bones outlined how these therapeutics present complex characterisation challenges. Dr Bones gave compelling characterisation case studies using charge variant analysis with mass spectrometric detection to characterise biologics in their native state.
Prof Mike Butler, NIBRT's Chief Scientific Officer, outlined his team's strategy in using bench top bioreactors to devise control strategies for biopharma manufacturing. Focusing in on three examples, Prof Butler outlined methodologies to control glycosylation of biologics via

- Glycoengineering of cell lines
- Substrate limitation in culture media
- Enzymatic re-modelling of glycosylation in downstream processing

A guest speaker, Dr Ioscani Jiménez del Val from the School of Chemical and Bioprocess Engineering, University College Dublin summarised his talk as "*adding maths to biopharma*". Dr del Val's work focus on synergising multi-scale computational modelling with advanced experimental strategies to:

- Define bioprocess control strategies that lead to optimal product yield and quality
- Identify cell engineering strategies for optimal bioprocess performance
- Help design bioprocesses with optimal yield and quality reducing time to market and improving bioprocess flexibility

Dr Colin Clarke gave an overview of the Bioinformatics and Data Analytics group in NIBRT. Earlier this year Dr Clarke and collaborators using ultra-deep next generation sequencing techniques published the first mitochondrial genome sequencing in Chinese hamster ovary cells. The audience heard how innovative bioinformatics techniques such as ribosomal foot printing are revising our understanding of the "central dogma" of molecular biology. Such techniques are now being applied to optimise CHO cells production of increasingly complex non-native molecules.
Dr Clarke's talk was complemented by Prof Niall Barron's presentation on "*Cell Engineering Approaches*

to Improving Biopharmaceutical Production in CHO Cells". Prof Barron, who has recently joined NIBRT, gave an overview of his team's impressive range of collaborations including Lilly, Biogen and Lonza. Prof Barron outlined how productivity in CHO cells for complex molecules can be improved using cutting edge molecular biology techniques such as CRISPR/CAS9 editing and knock-outs of micro RNA expression. Dr Radka Fahey completed the scientific presentations and building on the world leading research of Prof Pauline Rudd outlined her team's advances in the understanding of the regulation of glycosylation and its role in disease and biopharma manufacturing. In particular, Dr Fahey discussed how her team's development of advanced high throughput analytical techniques has facilitated real time optimisation, fault detection and troubleshooting of glycosylation of biologics manufacturing

The agenda also featured Dr Marion Boland, Head of Post-Award at Science Foundation Ireland who outlined how sustained strategic investment has resulted in Ireland being listed an impressive 10th in the global scientific rankings. Dr Boland also gave an overview of the various current and future funding models from SFI to build collaborations based on excellent science delivering economic and societal impact.

Further emphasising the theme of collaboration, Dr Sarah Hudson from UL gave an overview of the development of the Bernal Institute and the current investment in biologic infrastructure.

The busy day included a tour of NIBRT with a specific focus on the new GE Single Use Centre of Excellence and ThermoFisher Characterisation laboratory. NIBRT also provided an overview of their contract research capabilities including glycan analysis, host cell protein analysis and single use process development capabilities.

Concluding events, the NIBRT team again emphasised the "*open door"* policy to collaboration which has seen the Institute and its partners deliver such impressive results.

Ends

To request a copy of any of the talks please contact info@nibrt.ie

Topic	**Speaker**
Welcome and NIBRT Research Strategy	Dominic Carolan
How do I collaborate with NIBRT	Killian O'Driscoll
Charge Variant Analysis Coupled Mass Spectrometry - A New Approach for Biopharmaceutical Characterization	Dr Jonathan Bones
Bioprocess production platforms for high quality biopharmaceuticals	Prof Mike Butler
A multi-scale approach to modelling pharmaceutical bioprocesses	Dr Ioscani Jimenez del Val, UCD
SFI update	Dr Marion Boland, SFI
Understanding the systems biology of CHO cell factories	Dr Colin Clarke
Regulation of glycosylation and its role in disease, the mechanism of action of drugs and bioprocessing	Dr Radka Fahey
Supporting industry requirements for biopharmaceutical characterization	Dr Brian Morrissey
Funding and Industry case studies	Dr Ciara McManus
Chuning the CHO cell: An overview of the cell engineers toolkit	Prof Niall Barron
Bridging the gap between the biopharma industry and academic research at the Bernal Institute	Dr Sarah Hudson, UL