

ThermoFisher
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National Institute for
Bioprocessing Research
and Training

Research Case Study

NIBRT and ThermoFisher Scientific



CASE STUDY

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Jonathan Bones, one of NIBRT's leading principal investigators and his team chose to partner with Thermo Fisher Scientific because as the world's leading company in serving science, partnering with Thermo Fisher Scientific provides access to state of the art instrumentation, capabilities and resources that span all aspects of biopharmaceutical manufacturing. At present, the team members on this active collaborative project include Sara Carillo, Craig Jakes, Tomos Morgan and Silvia Millán Martín, however the team is continuously expanding and looking for new recruits to work on this and other exciting projects in place within the Characterisation and Comparability Laboratory. Please visit <https://www.nibrt.ie/careers/> to view the current career opportunities and to learn more about Jonathan's team.

As part of the collaboration, the project team at NIBRT are developing analytical workflows for the complete characterisation of monoclonal antibodies, complex recombinant proteins and new modalities such as cell and gene therapies. To do this, the team use sample preparation and automation solutions from Thermo Scientific, such as the SMART Digest range of magnetic sample preparation and digestion reagents combined with the KingFisher Duo Prime Automation Station. The team have investigated the wide range of column chemistries, such as the MABPAC, Acclaim and Accucore products, available from Thermo Scientific for high performance separations of intact proteins, peptides, glycans, process related contaminants and raw materials using Thermo Scientific's unrivalled Vanquish UHPLC instrumentation coupled to high resolution Orbitrap mass spectrometers.

Since 2016, the project team at NIBRT have established many innovative methods for the characterisation of biopharmaceuticals. The team's activities have focused on demonstrating the power of the analytical technology, but ensuring that the developed methods are simple, user friendly and robust, without compromising the quality of the information produced. We strive to achieve these aims and to work with biopharmaceutical manufacturers to allow them to implement the developed methodology for routine applications in their R&D and quality laboratories. As part of the collaboration with Thermo Fisher Scientific, NIBRT have released many application notes and resources that are designed to provide complete workflows for a broad range of challenging attributes that need to be measured and controlled during biopharmaceutical analysis.

This ongoing collaboration allows NIBRT to access the newest chromatography and high-resolution mass spectrometry instrumentation and innovative chromatography solutions but also enables the team to shape new technology and make important and impactful contributions in the adoption of new standards in biopharmaceutical analysis.

For further information on the collaboration between NIBRT and Thermo Fisher Scientific, please [click here](#).

Other features on page:

Videos

1. <https://www.youtube.com/watch?v=7umJfLRvJk4>
2. <https://www.youtube.com/watch?v=e9may4qCgiE>
3. https://www.youtube.com/watch?v=Q9fcPa_iXrY

Webinars

1. <https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&partnerref=E.20CMD.PB103.31000.01&eventid=2227331&sessionid=1&key=CFE443209B5D3EB5463AF3A5C1C10CD7®Tag=841363&sourcepage=register>
<https://www.thermofisher.com/ie/en/home/global/forms/industrial/rapid-automated-peptide-mapping.html>
3. <https://themedicinemaker.com/webinar/rapid-automated-peptide-mapping-for-multi-attribute-monitoring>
4. <https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=https%3A%2F%2Fwww.thermofisher.com%2Fie%2Fen%2Fhome%2Fabout-us%2Fevents%2Findustrial%2Fchromatography-webinars.html&eventid=2058039&sessionid=1&key=BDD740971537FAFB1B2625DCED7724D0®Tag=&sourcepage=register>
5. <https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=https%3A%2F%2Fwww.thermofisher.com%2Fie%2Fen%2Fhome%2Fabout-us%2Fevents%2Findustrial%2Fchromatography-webinars.html&eventid=2058038&sessionid=1&key=2796F3323FF95808FCA4AB67CEFDA8FE®Tag=&sourcepage=register>
6. <https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=https%3A%2F%2Fwww.thermofisher.com%2Fie%2Fen%2Fhome%2Fabout-us%2Fevents%2Findustrial%2Fchromatography-webinars.html&eventid=2058037&sessionid=1&key=3C170CD4442378FF5FD68E0D2FE91F90®Tag=&sourcepage=register>

Links to the newest application notes from 2020:

1. <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/ab-73554-lc-ms-igg1-mab-variants-native-conditions-ab73554-en.pdf>
2. <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/ab-73555-lc-ms-igg1-mab-oxidation-variants-ab73555-en.pdf>
3. <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/ab-73556-lc-ms-peptide-mapping-igg2-mab-ab73556-en.pdf>

Links to application links from 2019

1. <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/an-21880-lc-ms-biosimilars-intact-mass-analysis-an21880-en.pdf>
2. <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/an-21918-lc-ms-monoclonal-antibody-preparations-an21918-en.pdf>
3. <https://assets.thermofisher.com/TFS-Assets/CMD/Application-Notes/an-21917-cva-ms-mab-an21917-en.pdf>

Most recent Peer-reviewed papers arising from the collaboration:

- › Large-Scale Assessment of Extractables and Leachables in Single-Use Bags for Biomanufacturing <https://pubs.acs.org/doi/10.1021/acs.analchem.8b01208>
- › Comprehensive characterisation of the heterogeneity of adalimumab via charge variant analysis hyphenated on-line to native high resolution Orbitrap mass spectrometry <https://www.tandfonline.com/doi/full/10.1080/19420862.2018.1531664>
- › Cracking Proteoform Complexity of Ovalbumin With Anion-Exchange Chromatography-High-Resolution Mass Spectrometry Under Native Conditions 10.1021/acs.jproteome.9b00375
- › A streamlined workflow for twoplexing of N-linked glycan analysis using light (12C6) and heavy (13C6) isotopologues of 3-aminobenzenesulfonic acid DOI: 10.1016/j.jaca.2019.11.055