

Session 350 [10:00-11:30]
EuChemS Division of Glycoscience - Advances in synthetic carbohydrate chemistry and catalysis

Dr. Joseph Byrne¹, Dr. Eoghan McGarrigle¹, Dr. Gavin Miller², Dr. Stefan Oscarson¹, Dr. Aisling Ni Cheallaigh²

¹University College Dublin, Dublin, Ireland. ²Keele University, Keele, United Kingdom

Abstract

This symposium highlights recent advances in synthetic carbohydrate chemistry. Approaches to controlled and selective synthesis of carbohydrates and their derivatives is vital to impactful applications of glycosciences, and has many challenging aspects. The symposium includes contributions on the topic of catalysis in carbohydrate chemistry, and a discussion of nucleoside synthesis. The highlight of this minisymposium will be the Haworth Award Lecture, delivered by 2024 Haworth medallist Prof. Stefan Oscarson (UCD). The award is given in recognition of Prof. Oscarson's seminal contributions to the synthesis of complex pathogen glycans, which have driven our understanding of immunological interactions, and paved the way towards novel therapeutic development. The Haworth Award was founded in 1969 in commemoration of Sir Norman Haworth (president of the Chemical Society 1944–46) and it is awarded for sustained, internationally recognised contributions to carbohydrate chemistry.

Chairperson: Joseph Byrne, UCD

10:00-10:25: *Catalysis in carbohydrate chemistry*, Eoghan McGarrigle, UCD

10:25-10:50: *Synthesis of nucleosides*, Gavin Miller, Keele University

10:50-11:30: *Haworth Award Lecture*, Stefan Oscarson, UCD

This session is one of four Glycoscience Minisymposia at ECC9, held to celebrate the foundation of EuChemS Division of Glycosciences and is supported by RSC Carbohydrate Interest Group. The other sessions are 355, 357 and 358.

Session 355 [13:30-15:00]
EuChemS Division of Glycoscience - Chemical glycobiology for human health

Dr. Michelle Kilcoyne¹, Dr. Paula Videira², Dr. Samy Cecioni³, Dr. Jonathan Dolan⁴, Dr. Martin Fascione⁵, Dr. Aisling Ni Cheallaigh⁶

¹University of Galway, Galway, Ireland. ²NOVA School of Science and Technology, Lisbon, Portugal. ³Université de Montréal, Montreal, Canada. ⁴Keele University, Keele, United Kingdom. ⁵University of York, York, United Kingdom. ⁶Keele University, Keele, United Kingdom

Abstract

This symposium showcases recent advances in chemical glycobiology that impact on health, highlighting the central role glycans and other carbohydrate-derivatives play in processes including disease. The symposium includes contributions on how altered glycosylation impacts immunopathology, strategies which use chemistry for traceable capture of glycan-protein interactions, details of a search for inhibitors of GDP-mannose dehydrogenase, and demonstrate the utility of glycobiology tools for studying ulosonic acids, among other carbohydrates.

Chairperson: Michelle Kilcoyne, University of Galway

13:30-13:55: *Insights on the immunopathology of altered glycosylation*,

Paula Videira, NOVA School of Science and Technology, Lisbon

13:55-14:20: *Chemical strategies for the traceable capture of glycan-protein interactions*,

Samy Cecioni, Université de Montréal

14:20-14:35: *Sweet targets: searching for GDP-mannose dehydrogenase inhibitors*,

Jonathan Dolan, Keele University

14:35-15:00: *Chemical glycobiology tools for the study of ulosonic acids and other sugars*,

Martin Fascione, University of York

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Session 357 [10:00-11:30]
Division of Glycoscience - Analytical and computational glycoscience for mapping human health and pathogenesis

Dr. Clare Mahon¹, Dr. Roisin O'Flaherty², Dr. Sean Austin³, Mr. Akash Satheesan², Dr. Alison Parkin⁴, Aisling Ni Cheallaigh⁵

¹Durham University, Durham, United Kingdom. ²Maynooth University, Maynooth, Ireland. ³Nestlé, Lausanne, Switzerland. ⁴University of York, York, United Kingdom. ⁵Keele University, Keele, United Kingdom

Abstract

This symposium highlights recent advances in glycoscience of using computational and analytical tools to gain insight into human health, disease development and progression. It includes contributions discussing utility of glycosylation in human disease in developing glycomedicine, details about approaches to quantitative determination of human milk oligosaccharides, computational approaches to characterising host glycan specificity in meningococcal infection, and description of how glycofluoroforms may be used for electrochemical sensing.

Chairperson: Clare Mahon, Durham University

10:00-10:25: *Glycomedicine: Harnessing Glycosylation in Human Health and Disease*,
Roisin O'Flaherty, Maynooth University

10:25-10:50: *Quantitative Determination of Human Milk Oligosaccharides*, Sean Austin, Nestlé

10:50-11:05: *Characterisation of the host glycan specificity and recognition by Neisseria meningitidis type IV pili filament (T4P) as the first step in meningococcal infection*,
Akash Satheesan, Maynooth University

11:05-11:30: *Harnessing glycofluoroforms for impedimetric biosensors*,
Alison Parkin, University of York

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Session 358 [13:30-15:00]
Division of Glycoscience - Applied Glycoscience for materials and sustainability

Dr. Clare Mahon¹, Dr. David Lim², Dr. Antoine Buchard³, Ms Emanuella Fiandra¹, Dr. Stephen Dooley⁴, Aisling Ni Cheallaigh⁵

¹Durham University, Durham, United Kingdom. ²Universität Bern, Bern, Switzerland. ³University of York, York, United Kingdom. ⁴Trinity College Dublin, Dublin, Ireland. ⁵Keele University, Keele, United Kingdom

Abstract

This symposium highlights innovative applications of glycoscience in the areas of materials and sustainability. As naturally-occurring feedstocks, carbohydrates can play an important role in reimagining areas of technology dominated by petrochemicals, but there are also challenges to be overcome to achieve this. Contributions to this symposium include presentation of strategies for protecting-group free synthesis of glycosides in water, discussion of polymer components that may be synthesised from sugars and other renewable resources, details of synthetic fabric surface modification of bio-sourced polyesters, and an overview of the interplay of mechanisms and theory of carbohydrates as sustainable fuels, which may impact climate issues.

Chairperson: Clare Mahon, Durham University

13:30-13:55: *Protecting-Group-Free Synthesis of Glycosides in Water*, David Lim, Universität Bern

13:55-14:20: *The synthesis of monomers from renewable resources such as glycerol and sugars towards polymers non-petrochemicals sources*, Antoine Buchard, University of Bath

14:20-14:35: *Polyesters Based on Biosourced Diglyoxylic Acid Xylose as Soil-Release Polymers for Synthetic Fabric Surface Modification*, Emanuella Fiandra, University of Durham

14:35-15:00: *Carbohydrates, from Mechanism and Theory to Climate Sustainable Fuels*
Stephen Dooley, Trinity College Dublin

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