From Batch to Flow: Advancing Synthetic Organic Chemistry through Technological Innovation

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The world of synthetic organic chemistry has made significant strides in discovering new medicines, materials, and fine chemicals. However, there is a major aspect that has been overlooked for years - the reactor itself. In this talk, we will explore the potential of flow chemistry to advance synthetic organic chemistry through technological innovation.

By harnessing the power of flow chemistry, chemists can unlock unique reactivity and selectivity, enabling them to push the boundaries of what is possible.[1] Not only does flow chemistry make new synthetic routes achievable, it can fast-track them from the lab to large scale production.[2]

At our research group, we are committed to advancing the field by developing automated and flow-based reaction technologies that reduce manual labor, increase reproducibility, and accelerate reaction discovery. Our focus on flow chemistry has led to exciting developments in methodological advancements, including photocatalysis, fluorine chemistry, and bioconjugation chemistry.

In this talk, we aim to showcase the potential of flow chemistry and how it can team up with methodological development to take synthetic organic chemistry to the next level. We will highlight the perks of flow chemistry, from improving reaction efficiency to enabling the discovery of new chemical reactions. Our ultimate goal is to inspire chemists to adopt this innovative technology and unlock new possibilities for synthetic organic chemistry.

[1] Capaldo, L.; Wen, Z. and Noël, T. A field guide to flow chemistry for synthetic organic chemists. *Chem.l Sci.*, **2023**, DOI: 10.1039/D3SC00992K.
[2] D.A. Zondag, S.; Mazzarella, D. and Noël, T. Scale-Up of Photochemical Reactions: Transitioning from Lab Scale to Industrial Production. *Annu. Rev. Chem. Biomol. Eng.*, **2023**, 14. DOI: 10.1146/annurev-chembioeng-101121-074313

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Timothy Noël is a researcher in the field of synthetic organic chemistry and technology, with a particular interest in the delicate synergy between the two fields. In 2004, Tim earned his MSc degree in Industrial Chemical Engineering before pursuing his passion for synthetic organic chemistry, which led him to complete his PhD in the field at Ghent University in 2009. Following his PhD, he traveled across the Atlantic as a Fulbright Postdoctoral Fellow to work with Professor Stephen L. Buchwald at the Massachusetts Institute of Technology (MIT), where he gained valuable experience and expertise in flow chemistry. Upon returning to Europe, he joined Eindhoven University of Technology as an Assistant Professor in 2012, and later became an Associate Professor in 2017. In 2020, Tim was promoted to Full Professor at the University of Amsterdam, where he is now the Chair of Flow Chemistry. His research in the area of flow chemistry was recognized with several awards, including the DECHEMA award (2017), the Hoogewerff Youth Prize (2019), the IUPAC-ThalesNano Flow Chemistry Award (2020), the KNCV Gold Medal (2021), ERC Consolidator Grant (2022), the ACS Sustainable Chemistry & Engineering Lectureship Award (2022) and the ChemSocRev Pioneering Investigator Lectureship (2023). He is the editor in chief of Journal of Flow Chemistry and the president of the Flow Chemistry Society.