EMBO Young Investigator Seminar

Ben Schumann *(The Francis Crick Institute)*

Glycosyltransferase Bump-and-hole Engineering to Understand Glycosaminoglycan Biosynthesis

Ben was trained as a biochemist in Tübingen and got his PhD in chemistry, with Peter H. Seeberger at the MPIKI Potsdam, receiving the Award for Excellence in Glycosciences and the Otto Hahn Medal by the Max Planck Society. During his postdoctoral work in the lab of Nobel Laureate Carolyn R. Bertozzi at Stanford, he developed “precision tools” to study glycosylation of human cells. He started as a Group Leader at the Francis Crick Institute and Imperial College London in 2018. He is an EMBO Young Investigator and received an ERC Starting Grant in 2023. He is Director of the MRes in Drug Discovery and Development at Imperial College.

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Glycosaminoglycans (GAGs) are major determinants of proteoglycan function and contribute substantially to the cell-surface glyco-code. Their functions are challenging to unravel. New chemical precision tools will enhance our understanding of GAG biology and complement existing methods of molecular and cell biology.

Fully-established GAG chains are structurally highly variable. Human cells express two homologous isoenzymes XylT1 and XylT2 that are individually associated with disease reflecting dysfunctional proteoglycans. Yet, the molecular details underpinning the functions of both isoenzymes are ill-defined.

Here, we develop a chemical biology approach *en route* to dissect the protein substrate specificities of human XylTs. By engineering and design, we incorporate a chemically modified analogue of the natural substrate that is not accepted by wildtype enzymes, and finally establish a cellular bump-and-hole system. This precision tool will provide insight into the repertoire and biosynthetic details of proteoglycans.

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Friday, February 16. 12:00H
CIC bioGUNE. Atrio 800

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EXCELENCIA SEVERO OCHOA

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