

Dr. Niels-Christian Reichardt
(*CIC biomaGUNE, San Sebastián*)

“Microarrays for Functional Glycomics.”

In a similar fashion as the development of microarrays in the late 90s had revolutionized genetics and protein research to the high throughput technologies genomics and proteomics, microarray technologies have changed the way we do glycoscience today. Hundreds of glycans can be printed with micrometer precision on a variety of surfaces and thousands of individual interaction events recorded simultaneously upon incubation with fluorescently marked proteins. Important glycan array applications include the substrate screening of carbohydrate processing enzymes, affinity screening of newly discovered lectins or the detection of autoantibodies in glycan array based diagnostic device (1). New materials and surface chemistries have opened the door for mass spectrometric, radiometric and surface plasmon readout of carbohydrate protein interactions or screening of enzyme function. Lectin arrays finally, are being developed into robust platforms for glycan biomarker discovery and with promising perspectives in clinical cancer diagnosis. The talk will give an overview over glycan and lectin array based tools developed in our lab to study the specificity of carbohydrate processing enzymes, C-type lectin receptors, for screening the antibody response of parasite infected patient cohorts and for the development of novel complex glycomimetics as immune checkpoint inhibitors in cancer (2,3,4,5,6).

- (1) Rillahan, C. D., and Paulson, J. C. (2011) Glycan microarrays for decoding the glycome. Annual review of biochemistry 80, 797–823.
- (2) Sanchez-Ruiz, A., Serna, S., Ruiz, N., Martin-Lomas, M., and Reichardt, N. C. (2011) MALDI-TOF Mass Spectrometric Analysis of Enzyme Activity and Lectin Trapping on an Array of N-Glycans. *Angewandte Chemie* 123, 1841–1844.
- (3) Serna, S., Yan, S., Martin-Lomas, M., Wilson, I. B., and Reichardt, N.-C. (2011) Fucosyltransferases as synthetic tools: glycan array based substrate selection and core fucosylation of synthetic N-glycans. *Journal of the American Chemical Society* 133, 16495–16502.
- (4) Sanchez-Ruiz, A., Serna, S., Ruiz, N., Martin-Lomas, M., and Reichardt, N.-C. (2011) MALDI-TOF mass spectrometric analysis of enzyme activity and lectin trapping on an array of N-glycans. *Angew. Chem. Int. Ed. Engl.* 50, 1801–4.
- (5) Serna, S., Etxebarria, J., Ruiz, N., Martin-Lomas, M., and Reichardt, N.-C. (2010) Construction of N-glycan microarrays by using modular synthesis and on-chip nanoscale enzymatic glycosylation. *Chemistry* 16, 13163–75.
- (6) Beloqui, A., Calvo, J., Serna, S., Yan, S., Wilson, I. B. H., Martin-Lomas, M., and Reichardt, N. C. (2013) Analysis of Amino-Functionalized Glycan, Glycoprotein, and Lectin Microarrays by MALDI-TOF MS. *Angew. Chem. Int. Ed. Engl.*



BIFI-Talks 2018
DIA Y HORA: **16 NOVIEMBRE A LAS 13:00**
LUGAR: **SALA DE CONFERENCIAS, EDIFICIO I+D+i,**
CAMPUS RIO EBRO