Minimum Information Required for A Glycomics Experiment

MIRAGE Commission* and Carsten Kettner
Takehno Str. 7-9, 60487 Frankfurt/Main, Germany: ckettner@beilstein-institut.de

Demands for Glycomics Data

The integration of glycan structural data with data from genomic, transcriptomic, metabolomic and proteomic analyses requires that
• the data must be of high quality and should be accompanied with information on statistical variability,
• they must have been obtained under comparable experimental conditions which require a definition of minimum experimental information,
• the data reported in the literature must be unambiguous,
• the data should be comprehensive and readily accessible by other scientists.

Publication Standards for Sample Preparations

18 February 2016, doi:10.3762/mirage.1

The sample preparation guidelines are designed to include all aspects of sample generation, purification and modification from biological and/or synthetic material. These guidelines are considered as a common basis for any further MIRAGE reporting guidelines (Struve, W. et al. (2016) Glycobiology 26(6):907).

(A) Publication Standards for Structural Analysis Data

Mass Spectrometry Analysis Reporting Guidelines
24 April 2013, doi:10.3762/mirage.2

The MS analysis reporting guidelines are based on the MIAPE guidelines template (V 2.24). However, in contrast to proteomics, different types of glycoconjugates require slightly different release approaches, which in turn can have direct influence on the conditions/parameters to be included in the report (Kolarich D. et al. (2013) Mol. Cell Prot. 12:997).

Liquid Chromatography Analysis Reporting Guidelines
1 March 2018, doi:10.3762/mirage.4

These guidelines are intended to improve the reporting of liquid chromatography (LC) glycan data. The MIRAGE-LC module covers all aspects of instrument setup and modality of data handling and manipulation cross-linked with other MIRAGE recommendations (Campbell, M. et al. in preparation).

(B) Publication Standards for Interaction Analysis Data

Initial efforts focus on the interactions that can be evaluated on a glycan microarray. Future expansion would include all types of interaction experiments, including but not limited to: SPR (surface plasmon resonance), flow cytometry, ELISA, STD-NMR and ITC (isothermal calorimetry).

Glycan Microarray Reporting Guidelines
22 June 2016, doi:10.3762/mirage.3

These guidelines were drafted to be intentionally minimal and apply only to information required for generating interpretable data from a glycan microarray experiment. Eight areas have been identified that are required for generating an unambiguous glycan array in the first instance and obtaining binding data. For each component of the workflow area guidelines are provided for the minimal information that should be included in the reporting results (Liu, Y. et al. (2017) Glycobiology 27(4):280. doi:10.1093/glycob/cww118).

*Members of the MIRAGE Commission

Sanjey Agrawal, Equilux, Ashburn,
Kiyoko Aoki-Kitaoka, Sendai University, Tokyo,
Matthew Campbell, Griffith University, Brisbane,
Caroline Costello, Boston University,
Ann Dell, Ten Fert, Stuart Heslam, Imperial College London,
Nicola Harrison, Nottingham University,
Kay-Hoel Kho, Academia Sinica, Taipei,
David Kolarich, Griffith University, Brisbane,
Frederique Licame, Swiss Institute of Bioinformatics, Geneva,
Yan Liu, Imperial College London,
Mike Neukom, Indiana University, Bloomington,
Ryan McBride, The Scripps Research Institute, La Jolla,
Nicole Peacher, Marquette University, Glyn;
James Paulson The Scripps Research Institute, La Jolla,
Kariann Ramzyng, University of Georgia, Athens,
Erdmann Rapp, IFP Bioinformatics, University of Washington,
Pauline Rudel, NIBRT, Dublin,
David Smith, Emory University, Atlanta,
Winston Struve, University of Oxford,
Michael Trommsdorff, Wittenberg, L/shoppe University, Georgia, Athens,
Joseph White, Boston University,
Carsten Kettner (co-ordination), Beilstein-Institut, Frankfurt am Main.

Project: www.beilstein-mirage.org. MIRAGE is primarily supported by the Beilstein-Institut.