Visualising and Building Glycans

Description

Many different publicly accessible glycoinformatics tools allow the building and visualisation of glycans structures. A thorough description of these instruments is provided in the review of Lal et al., (52). Nevertheless, a list of the main user-friendly programs, software, and servers used for sketching glycans is reported below.

SugarSketcher: JavaScript interface to draw online glycan structures. The structures are represented following Symbol Nomenclature for Glycans (SNFG) and can be imported and exported either in text format (GlycoCT) or image (.svg). It is linked to the above mention GlyTouCan database to query the generated carbohydrate structures. (https://glycoproteome.expasy.org/sugarsketcher/)

LiGraph: Inside the Glycosciences.de environment, Ligraph is a sugar notation tool as the schematic structures can be created using a text input. The way to proceed is by writing a list of names and connections, selecting the specific notation for the structure, and submitting it to finally obtain the resulting scheme and legend that can be saved in .svg format. (http://www.glycosciences.de/tools/LiGraph/)

GlycoGlyph: Open-source online tool allows the user to draw glycans with SNFG symbols through a graphical user interface (GUI) or via text inputs in CFG linear nomenclature. It is also possible to obtain a GlyTouCan ID for a drawn structure or inserted name. The construction generated using the top buttons appears in the canvas allowing to export it in GlycoCT text format or .svg image. (https://glycotoolkit.com/glycoglyph)

GlycanBuilder2: can work in different platforms such as Windows, macOS and Linux. Either manually or by importing text input files, this application uses SNFG to generate the glycan structures, and it is also possible to search or register them in GLyTouCan. The most interesting thing is the wide range of formats that it supports, making it a good tool to sketch and build glycan structures and convert them from one format to another. (http://www.rings.t.soka.ac.jp/downloads.html)

Original GlycanBuilder: Integrated into SugarbindDB, Glycan Builder is an online tool that allows sketching glycan structures that can be used to search the database. Different glycan notations can be used for generating the glycan. Together with the different available exporting formats, it makes this tool very versatile. (https://sugarbind.expasy.org/builder)

DrawRINGS: Online tool to generate glycan structures. It allows drawing the structures with flexible geometry thanks to monosaccharides free movement and uses the resulting structure as a query to search in the glycan database. (http://rings.t.soka.ac.jp/cgi-bin/drawrings.pl)

DrawGlycan-SNFG: Open-source program with a web interface that uses IUPAC-condensed text inputs. However, a standalone GUI version can be downloaded (supported in Windows, macOS and Linux) to generate the glycans also using SNFG. (http://www.virtualglycome.org/DrawGlycan/)

Glycano: Being able to generate the structures in a canvas using UCT or ESN format is an online tool to generate the glycan structures. (http://glycano.cs.uct.ac.za/)

GlycoEditor: Online software for sketching glycan structures with an easy way to define linkages and configuration once the sugar is dragged to the canvas. Moreover, it is possible to generate repeating units, and different functionalisation options are available. It is also possible to use the resulting sketch to search for matches in the database. (https://jcggdb.jp/idb/flash/GlycoEditor.jsp)

GLYCO.ME (SugarBuilder): Online software to draw glycans, which allows the use of 13 different monosaccharides. Some templates as the generated glycan have to be linked to a Ser, Thr or an Asn residue. Once the monosaccharide is selected, defining the type of linkage when adding the new residue is possible. Files can be exported as .png or .svg images. (https://beta.glyco.me/sugarbuilder)

KegDraw: Application that works locally once download to generate glycan structures. It has an interesting mode called Glycan mode, which allows the design of glycan structures by using the lists for defined glycans or the text box for uncommon monosaccharides.
(https://www.kegg.jp/kegg/download/kegtools.html)

Category

1. News