GLYcoDiag's Newsletter – April/May 2020

GLYcoDiag is a French company specialized **in glycobiology and glycoanalysis services and products** for the biotech, pharma, veterinary, cosmetic and diagnostic industries. Our unique experience provides the services and products needed to speed up your projects. **Visit our website for more information** www.glycodiag.com

GLYcoDiag's products new distributor

GLYcoDiag announces that Clinisciences is now a new distributor of its following products such as :

- Lectins (naturals and recombinants),
- Neoglycoproteins and neoglycoclusters,
- LEctPROFILE plates and kits,
- LEctPROFILE gels and CarbPROFILE gels.

Clini Sciences
www.clinisciences.com

Have a look on Clinisciences website at www.clinisciences.com or on GLYcoDiag website at www.glycodiag.com to learn more about GLYcoDiag's products.

Can we fight the COVID-19 without glycosciences?

In December 2019, the first cases of a new pneumonia were detected in China. The outbreak of COVID-19 is caused by the virus SARS-CoV-2 *(Severe Acute Respiratory Syndrome Coronavirus 2)* similar to its homologous virus, SARS-CoV (2003).

SARS-CoV-2 entry into host cells is mediated by the transmembrane spike (S) V-shaped glycoprotein that forms homotrimers protruding from the viral surface. Glycans present on S glycoprotein participate in its folding, they affect priming by host proteases and modulate antibody recognition.[1] So far 22 N-glycosilation sites were predicted but only 17 were found to be occupied. They are predominantly high mannose and complex-type glycans. O-glycosylation at sites Thr323 (mucine-type o-glycans) and Ser325 on the S1 subunit of SARS-CoV-2 spike protein was found .[2]

The receptor hACE2 as well takes part in this disease. It is classified as a zinc metalloprotease, which enzymatically functions as a carboxypeptidase.[3] It is found especially in lungs and intestine cells. This protease is a type-I transmembrane protein and includes an extracellular, a transmembrane and a cytosolic domain within a total of 805 amino acids. N-glycosylation was observed at seven predicted N-glycosylation sites of hACE2. Core-1 mucin type O-glycan GalNAcGalNeuAc2 was observed as predominant glycan on sites Ser155 and Thr730. 97 % of peptide with Thr730 was occupied by O-glycans GalNAcGalNeuAc (2 %) and GalNAcGalNeuAc2 (95%).[3]

The elucidation of the glycan range on the spike protein and on the receptor propels research towards the development of new suitable treatments. Figure 1 show the first structure of the SARS-CoV-2 Receptor Binding Domain in complex with a human antibody. The epitope is inaccessible in the "closed" prefusion S structure, but is accessible in "open" conformations.[4] Moreover, another antibody, named S309, potently neutralizes SARS-CoV-2 and SARS-CoV pseudoviruses as well as authentic SARS-CoV-2. It recognizes a protein/glycan epitope on the SARS-CoV-2 SB, distinct from the receptor-binding motif. The epitope is accessible in both the open and closed states.[5]

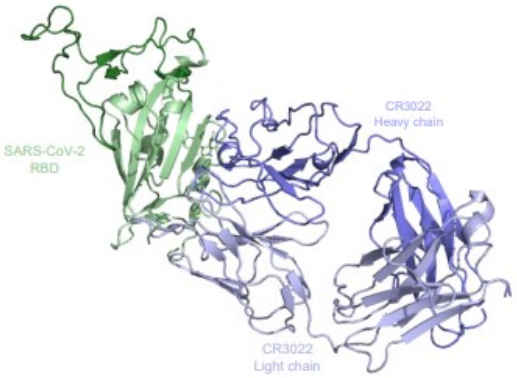

Figure 1. First structure of the SARS-CoV-2 Receptor Binding Domain in complex with a human antibody[4]

1. Walls A. C., *et al., Cell*. **2020** (DOI:10.1101/2020.02.19.956581)
2. Shajahan A. *et al.,* bioRxiv, **2020** (DOI: 10.1101/2020.04.01.020966)
3. Shajahan A. et al., bioRxiv, **2020** (DOI:10.1101/2020.05.01.071688)
4. Joyce *at al.*, BioRxiv **2020** (DOI: 10.1101/2020.03.15.992883)
5 Pinto D. et al., bioRxiv, **2020** (10.1101/2020.04.07.023903)

How GLYcoDiag can help you in this field?

- Expertise in the field of glycan-protein interactions
- Characterisation of antibodies glycosylation (*i.e.* GLYcoPROFILE studies, N-glycans profiling, ...)
- Access to lectins whit different osidic specificities to establish the glycan signature of virus or your glyco-molecules (*e*.g. Sialic acid binding lectins for NeuAc & NeuGc, Mannose-binding lectins, fucose-binding lectins)

Contact-us for more information and discussions

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