AUTONOMOUS GLYCOSYLATION IN GIANT VIRUSES

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Giant viruses (GVs) differ from regular viruses in many ways. With few exceptions, their physical size is above 200 μm and it can be beyond 1 μm. The genome size is quite variable; it ranges from 0.150 in *Phaeovirus* (*Phycodnaviridae* family) to 2.5 Mbp in *Pandora salinus* (*Pandoraviridae* family). Despite these genomes range in size, all of them encode genes with functions commonly not found in human pathogenic viruses, and a common trait is the presence of genes able to manipulate carbohydrates at a different level. For this reason, GVs are gaining interest in the field of Glycobiology. Giant dsDNA viruses are catalogued in different families, with some yet to be classified. This lecture will focus on the experimental data collected for a few members of *Phycodnaviridae* and *Mimiviridae* families.
Regarding *Phycodnaviridae*, to date information is available for *Chloroviruses.* Chloroviruses are large (190 nm in diameter) icosahedral, plaque-forming viruses with an internal lipid membrane; they have genomes of 290 to 370 kb that contain up to 400 protein-encoding genes [1]. The prototype chlorovirus is *Paramecium bursaria chlorella virus* (PBCV-1), and its major capsid protein Vp54 is N-glycosylated by a complex oligosaccharide (Figure 1a) [2,3]. The glycobiology of PBCV-1 will be presented as well as information about its antigenic variants and other related chloroviruses [4-6]. As for *Mimiviridae*, these viruses infect *Acanthamoeba* sp. and were initially identified as bacteria because of their large size along with the heavily glycosylated fibrils of the capsid. Within *Mimiviridae*, information is available for *Mimivirus* and *Megavirus* genera, and this lecture will focus on the recent structural data available on APMV, the representative virus in *Mimivirus* genus (Figure 1b) [7].

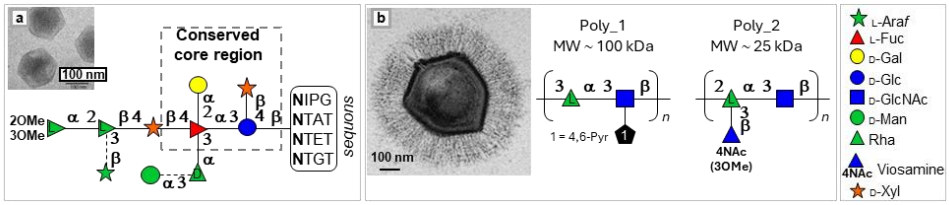

Figure 1. Electron microscopy images of: a) PBCV-1 and b) APMV along with the related glycans.

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