Adjusting the makeup of Glycan proteins to improve IgG BBB permeability

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Alzheimer's disease (AD) affects around 10% of the world's population, and it is estimated that within the next 50 years, this diagnosis is expected to to triple. Alzheimer's disease is a neural disorder in which proteins are degrading neural cells and connections. The permeability of antibodies in the brain is very low. This makes it difficult to attack neural diseases in a conventional manner. IgG antibodies are a popular class of immunotherapy and they are used in clinical trials of AD. β-amyloid peptides are found in the brain of AD patients and these kinds of therapies are used to target and eliminate these peptides, as they are the cause of neural degradation. The only issue with this method is that IgG antibodies are not transported effectively in the brain. Dr. Finke in previous studies found that Fab α2,6-sialylated glycans on anti-amyloid IgG antibody 4G8 show a lower BBB efflux without a lower influx. Recent studies show polyclonal human IgG drug IVIG exhibits a different BBB response to sialic acid cleavage versus 4G8 cleavage. Efflux as well as Influx were increased with the removal of sialic acid. The general method that we go through is simply a glycan release, glycan purification, glycan labeling, and excess dye removal. All of this will be shown with HPLC analysis. We find that our data expresses what has been shown in published studies.