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# Recognition of NeuGc GM3 ganglioside by the anti-tumor antibody 14F7 is modulated by the membrane environment.

Aberrant glycosylation is a common feature related to tumor progression, making tumor-associated glycolipids promising molecular targets in antineoplastic therapies and vaccine strategies. 14F7 is an anti-tumor antibody with high clinical potential, which has an extraordinary specificity for NeuGc GM3, but does not recognize the very similar, ubiquitous NeuAc GM3. Understanding the molecular details of this specificity would highly reinforce the value of 14F7 as a novel anti-cancer drug. Using model membrane systems, we show that 14F7 recognizes NeuGc GM3 only above a certain threshold of lipid concentrations. This "all-or-nothing"effect was exacerbated in giant unilamellar vesicles and multilamellar vesicles, whereas no binding was observed to 100 nm liposomes, emphasizing that the 14F7–NeuGc GM3 interaction is additionally modulated by membrane curvature. Unexpectedly, the presence of other glycolipids in the membranes strongly modulated the binding affinity to NeuGc GM3-containing liposomes. This effect may be important for tumor recognition, where the overall changes in glycolipid profiles may enhance 14F7 binding to even small amounts of NeuGc GM3.

## References

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