SUPPORTING INFORMATION

Ganglioside enriched phospholipid vesicles induce cooperative Aβ oligomerization and membrane disruption

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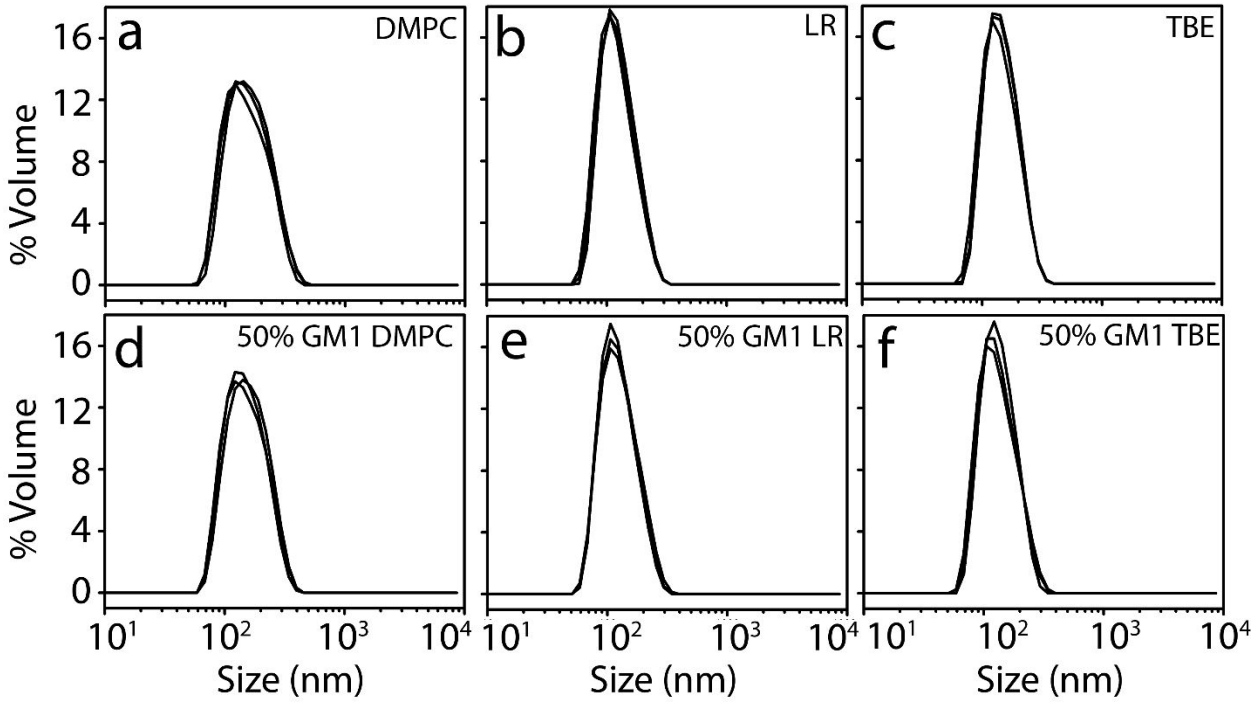

Figure S1: DLS of (0.2 mg/mL) DMPC, LR and TBE LUVs with (a, b, and c) or without (d, e, and f) GM1 extruded with 200 nm pore-sized polycarbonate membrane.

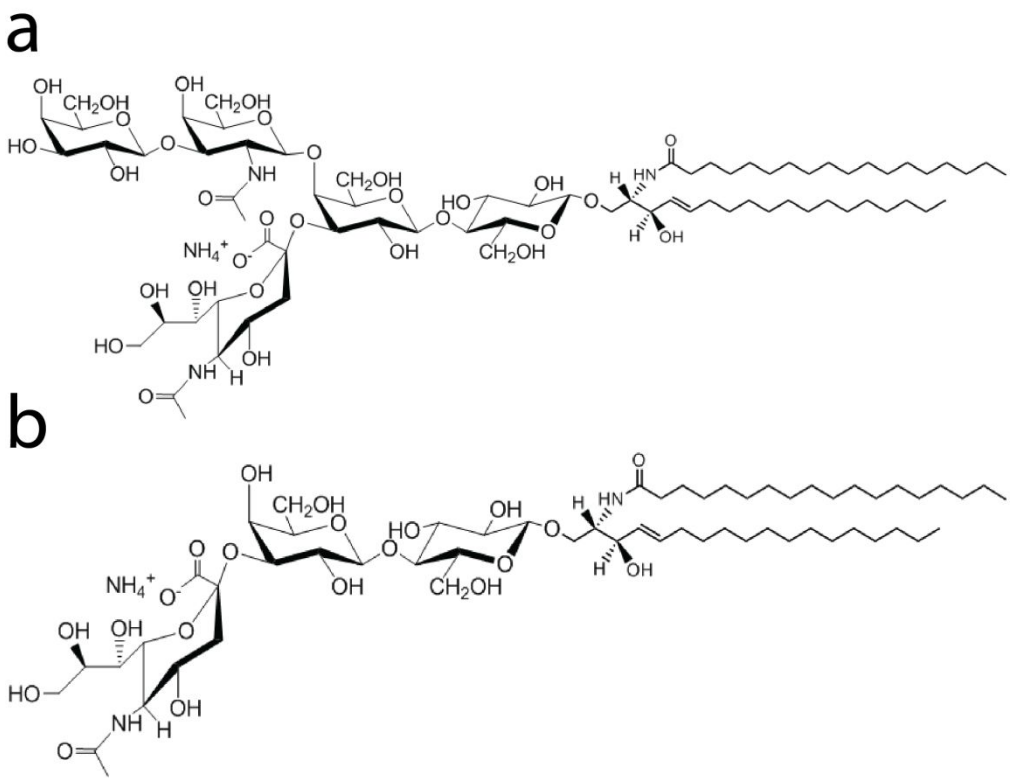

Figure S2: Representative structures of (a) GM1 and (b) GM3 gangliosides

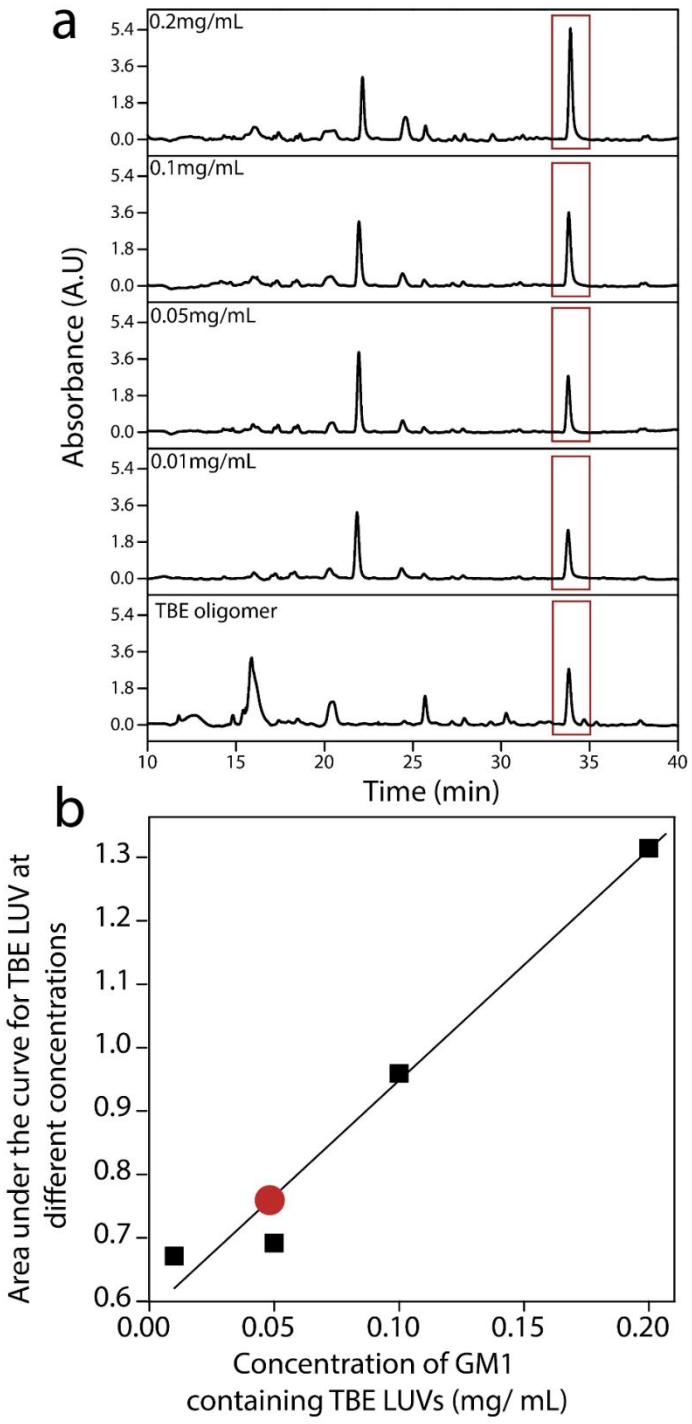

Figure S3: Quantification of lipid present within oligomers isolated from 50% GM1 doped TBE LUV and Aβ reaction incubated for 5h. a) HPLC chromatograms of TBE LUV at concentration of 0.2 ,0.1, 0.05 and 0.01 mg/mL respectively were used to plot the (b) Standard curve for TBE lipid. 5μM of isolated oligomer from 50% GM1 doped TBE LUV (last panel in (a)) and Aβ reaction was run on HPLC and peak

corresponding to the TBE LUV was quantified using the standard curve plotted with TBE LUV (● in red in (b)).

Parameter/Metric	Value
k_{fb}^{on} (in $h^{-1}\mu M^{-1}$)	15943.04
k^{on}	15033.80
k_{nu}^{on} (in $h^{-1}\mu M^{-1}$)	20.10
$k_{fb\_}^{on}$ (in h^{-1})	16.50
$k_{nu\_\_}^{on}$(in h^{-1})	2.46
SSE	0.02

Table S1: Table showing the parameter/metric values in case of the control data.

Parameter/Metric	Value
k_1^{off}	1723.83
k_1^{con} (in $h^{-1}\mu M^{-1}$)	25.55
k^{el} (in $h^{-1}\mu M^{-1}$)	21310.81
$k_{\_}^{el}$ (in h^{-1})	0.0037
$k_{\mp}$ (in $h^{-1}\mu M^{-1}$)	88.49
k^{nu} (in $h^{-1}\mu M^{-1}$)	0.1009
$k_{\_}^{nu}$ (in h^{-1})	1E-05
k_2^{off}	4.94
$k_{\_}$ (in h^{-1})	3.33
k_2^{con} (in $h^{-1}\mu M^{-1}$)	95.21
$k_1^{con\prime}$ (in h^{-1})	11.26
$k_2^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	99.99

L (in μM)	0.0085
SSE	0.047

Table S2: Table showing the parameter/metric values in case of the oligomerization data with 0% GM1 lipids and monomers.

Parameter/Metric	Value
k_1^{off}	31.44
k_1^{con} (in $h^{-1}\mu M^{-1}$)	1.39
k^{el} (in $h^{-1}\mu M^{-1}$)	319.64
k_-^{el} (in h^{-1})	25.94
k_+ (in $h^{-1}\mu M^{-1}$)	2769.54
k^{nu} (in $h^{-1}\mu M^{-1}$)	165.99
k_-^{nu} (in h^{-1})	0.457
k_2^{off}	11.86
k_- (in h^{-1})	21.49
$k_1^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	4.48
k_2^{con} (in $h^{-1}\mu M^{-1}$)	99.48
k_3^{con} (in $h^{-1}\mu M^{-1}$)	51.36
k_4^{con} (in $h^{-1}\mu M^{-1}$)	1.59
$k_2^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	7.158
$k_3^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	74.25
$k_4^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	95.12
L (in μM)	0.044

SSE	0.12

Table S3: Table showing the parameter/metric values in case of the oligomerization data with 50% GM1 lipids and monomers.

Parameter/Metric	Value (Unsonicated)	Value (Sonicated)
k_+ (in $h^{-1}\mu M^{-1}$)	48.522	48.88
k_2^{off}	4.844	4.89
k_- (in h^{-1})	0.20	0.20
$k_1^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	1.77	1.40
$k_2^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	71.13	67.71
L (in μM)	0.08	0.1
SSE	0.12	0.10

Table S4: Table showing the parameter/metric values in case of the oligomerization data with 0% GM1 lipids and fibrils.

Parameter/Metric	Value (Unsonicated)	Value (Sonicated)
k_+ (in $h^{-1}\mu M^{-1}$)	49.92	47.38
k_2^{off}	5.11	4.15
k_- (in h^{-1})	0.52	0.23
$k_1^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	2.54	2.86
$k_2^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	52.64	20.85
L (in μM)	0.06	0.06
$k_3^{con\prime}$ (in $h^{-1}\mu M^{-1}$)	0.5	14.30

k_4^{conv} (in $h^{-1}\mu M^{-1}$)	0.5	100
SSE	0.04	0.04

Table S5: Table showing the parameter/metric values in case of the oligomerization data with 50% GM1 lipids and fibrils.

No of pores	Oligomer size	SSE
1	2	0.0591
1	3	0.0777
1	4	0.1033
1	5	0.1308
1	6	0.0747
2	**2**	**0.0473**
2	3	0.0535
2	4	0.0867
2	5	0.1288
2	6	0.1756
3	2	0.0509
3	3	0.0603
3	4	0.0879
3	5	0.1237
3	6	0.1830

Table S6: Table showing the SSE values with the variation in the number of holes and the first oligomer in case of the oligomerization data with 0% GM1 lipids and fibrils.

No of pores	Oligomer size	SSE
3	2	0.4814
3	3	0.2472
3	4	0.1518
3	5	0.2610
3	6	0.3846
3	7	0.4954

3	8	0.6053
4	2	0.1887
4	**3**	**0.1200**
4	4	0.1620
4	5	0.1917
4	6	0.3725
4	7	0.4367
4	8	0.6692
5	2	0.3388
5	3	0.1705
5	4	0.2025
5	5	0.2028
5	6	0.3279
5	7	0.3507
5	8	0.4763

Table S7: Table showing the SSE values with the variation in the number of holes and the first oligomer in case of the oligomerization data with 50% GM1 lipids and fibrils.