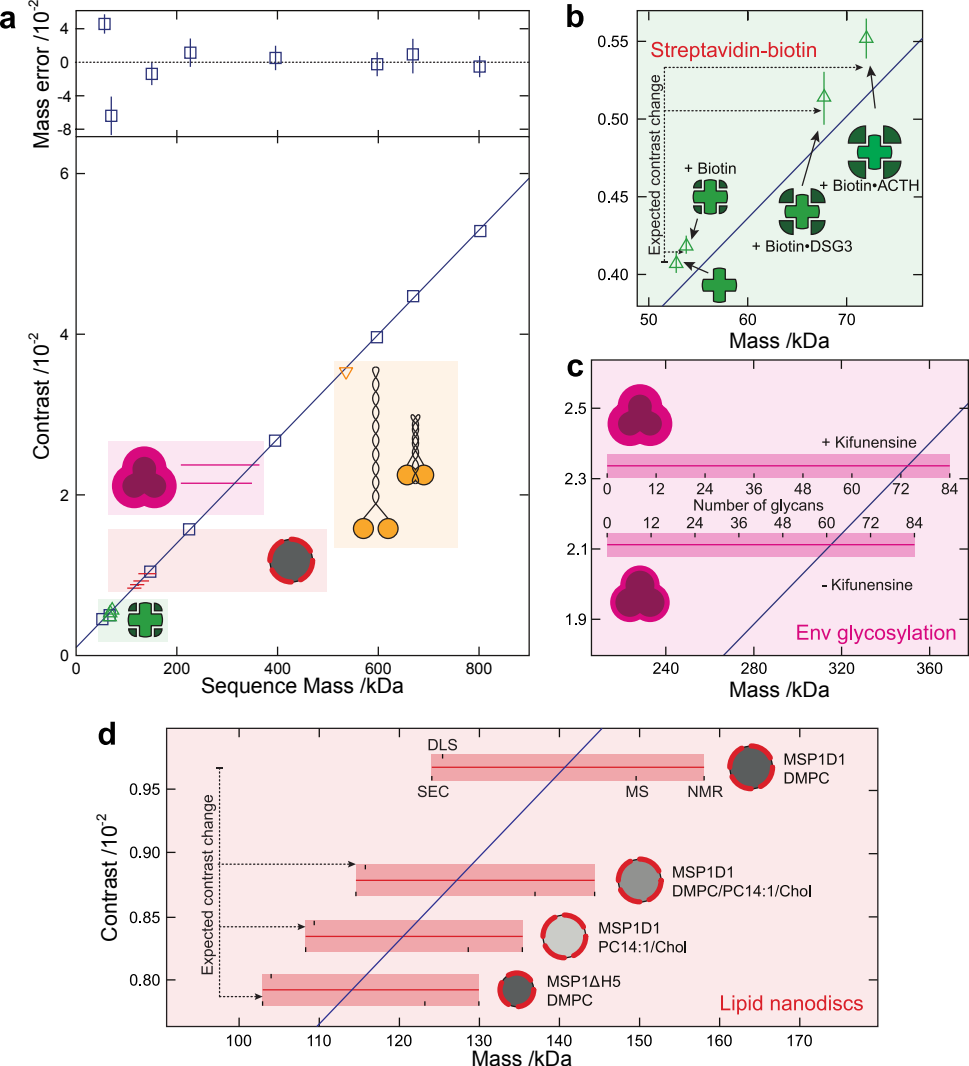

a
Mass error /10-2
4
0
-4
-8
Contrast /10-2
6
4
2
0
0
200
400
600
800
Sequence Mass /kDa
b
Streptavidin-biotin
Expected contrast change
+ Biotin
+ Biotin•ACTH
+ Biotin•DSG3
0.55
0.50
0.45
0.40
50
60
70
Mass /kDa
c
+ Kifunensine
- Kifunensine
Number of glycans
0
12
24
36
48
60
72
84
2.5
2.3
2.1
1.9
240
280
320
360
Mass /kDa
Env glycosylation
d
DLS
SEC
MS
NMR
MSP1D1
DMPC
MSP1D1
DMPC/PC14:1/Chol
MSP1D1
PC14:1/Chol
MSP1ΔH5
DMPC
Expected contrast change
Contrast /10-2
0.95
0.90
0.85
0.80
100
110
120
130
140
150
160
170
Mass /kDa
Lipid nanodiscs