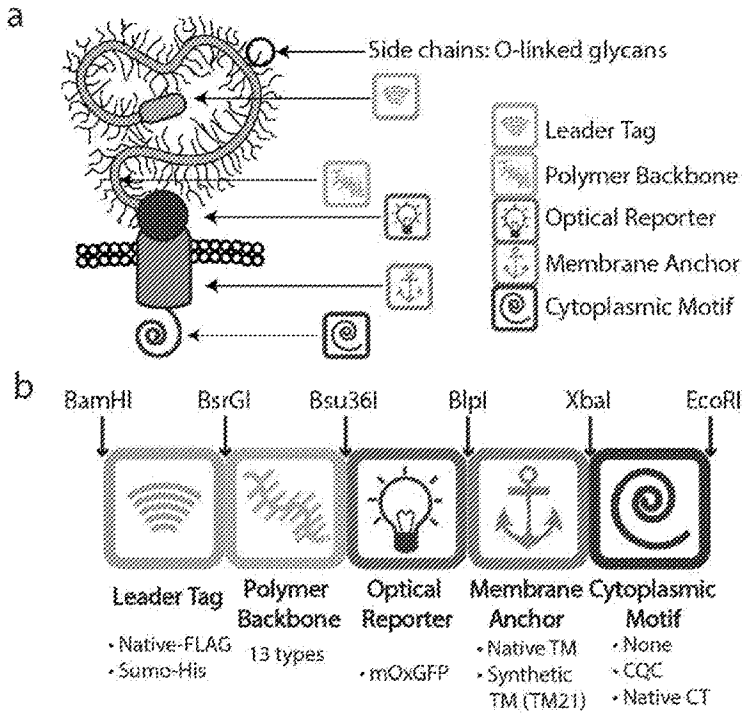
Part I Figures



c

Backbone Construction

1. Design desired mucin polymer backbone → 2. Find least repetitive coding DNA sequence → 3. Replace codons with low frequency usage → 4. Custom gene synthesis (CGS) → Polymer Backbone

d

Condon-scrambled Polymer Backbones (13 total)

Name	Sequence	# Repeats	%S/T
Wild-type Muc1	PDTRPAPGSTAPPAHGVTSA	x0, x10, x21, x42	25.0
Muc1 single mutant (Muc1_S)	PDTRPAPGATAPPAHGVTSA	x21	20.0
Muc1 double mutant (Muc1_D)	PDTRPAPGATAPPAHGVTAA	x21	15.0
Muc1 triple mutant (Muc1_T)	PDARPAPGATAPPAHGVTAA	x21	10.0
Synthetic 1 (Syn1)	DAATPAP	x40, x80	14.2
Synthetic 2 (Syn2)	DAATPAPP	x40, x80	12.5
Synthetic 3 (Syn3)	PPASTSAPG	x40	33.3
Lubricin consensus (Syn4)	KEPAPTTP	x20	25.0

Figure 1