Figure 1

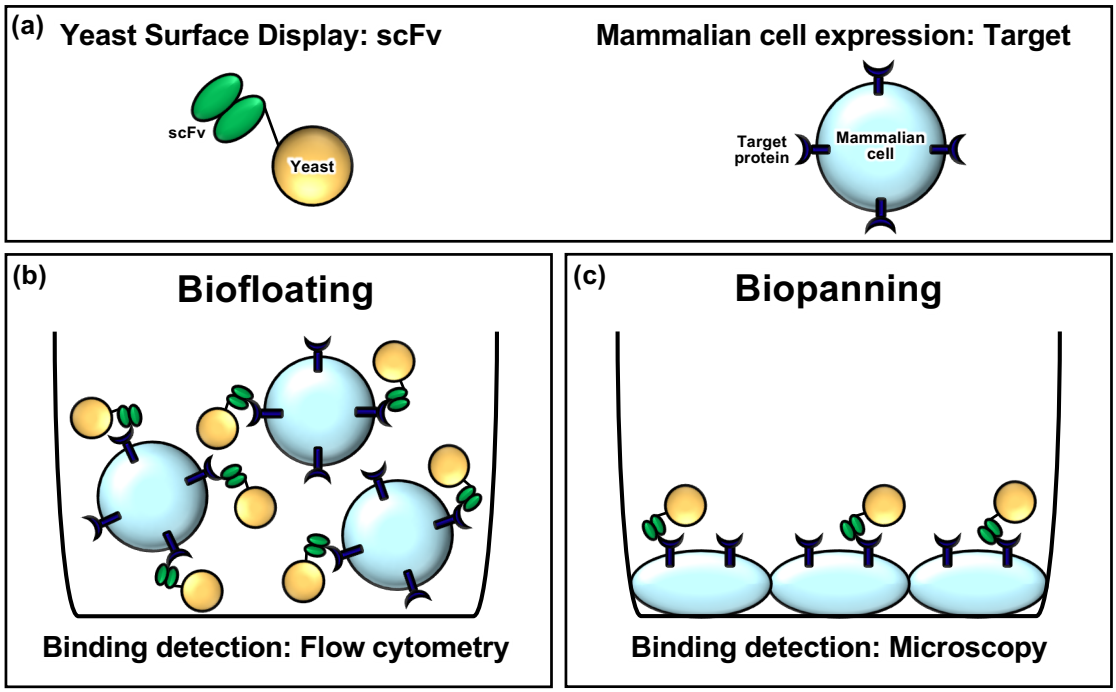

(a)
Yeast Surface Display: scFv
scFv
Yeast
Mammalian cell expression: Target
Target protein
Mammalian cell
(b)
Biofloating
Binding detection: Flow cytometry
(c)
Biopanning
Binding detection: Microscopy

Figure 2

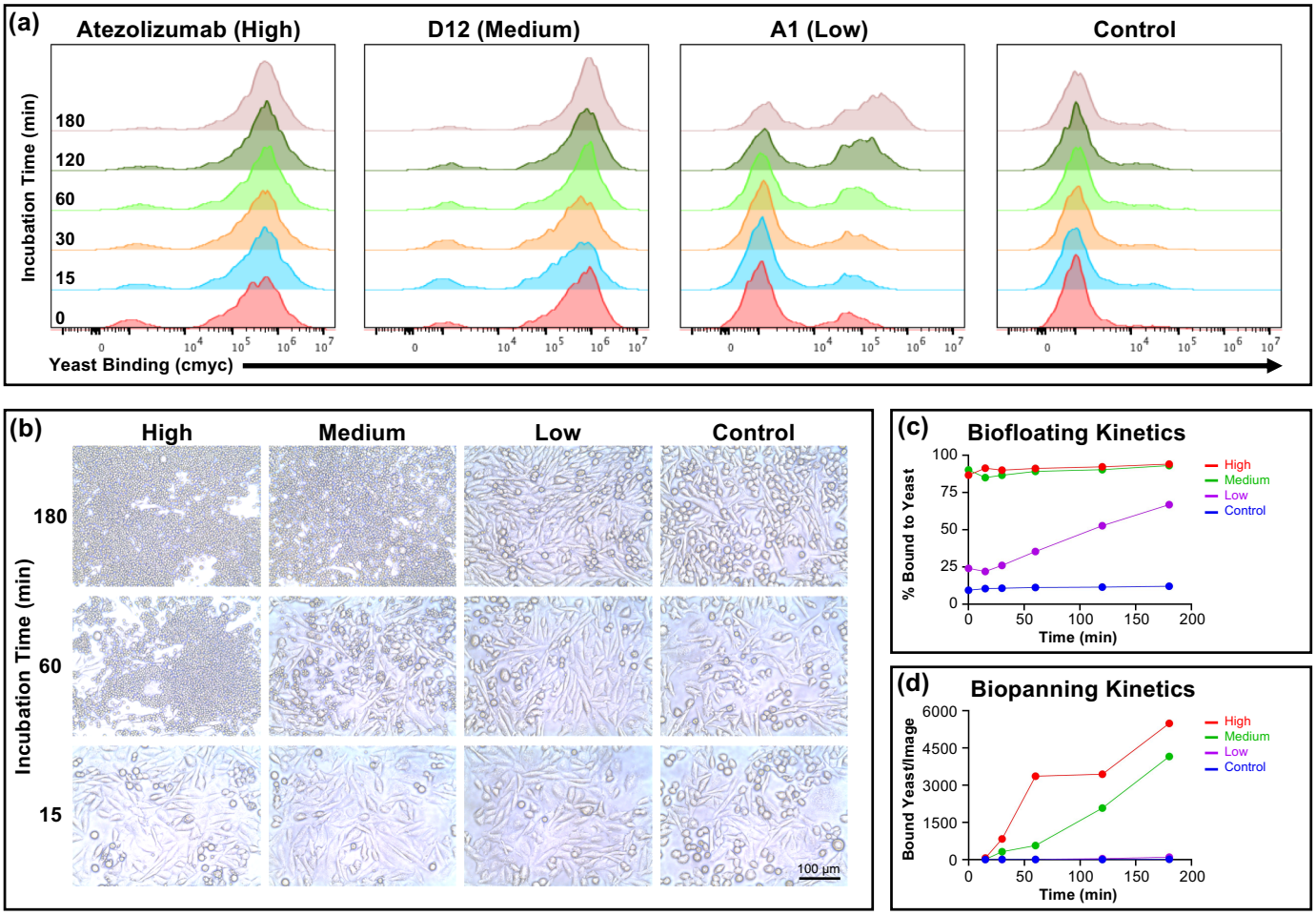

(a)
Atezolizumab (High)
D12 (Medium)
A1 (Low)
Control
Incubation Time (min)
180
120
60
30
15
0
Yeast Binding (cmyc)
(b)
High
Medium
Low
Control
Incubation Time (min)
180
60
15
100 µm
(c)
Biofloating Kinetics
% Bound to Yeast
Time (min)
High
Medium
Low
Control
(d)
Biopanning Kinetics
Bound Yeast/Image
Time (min)
High
Medium
Low
Control

Figure 3

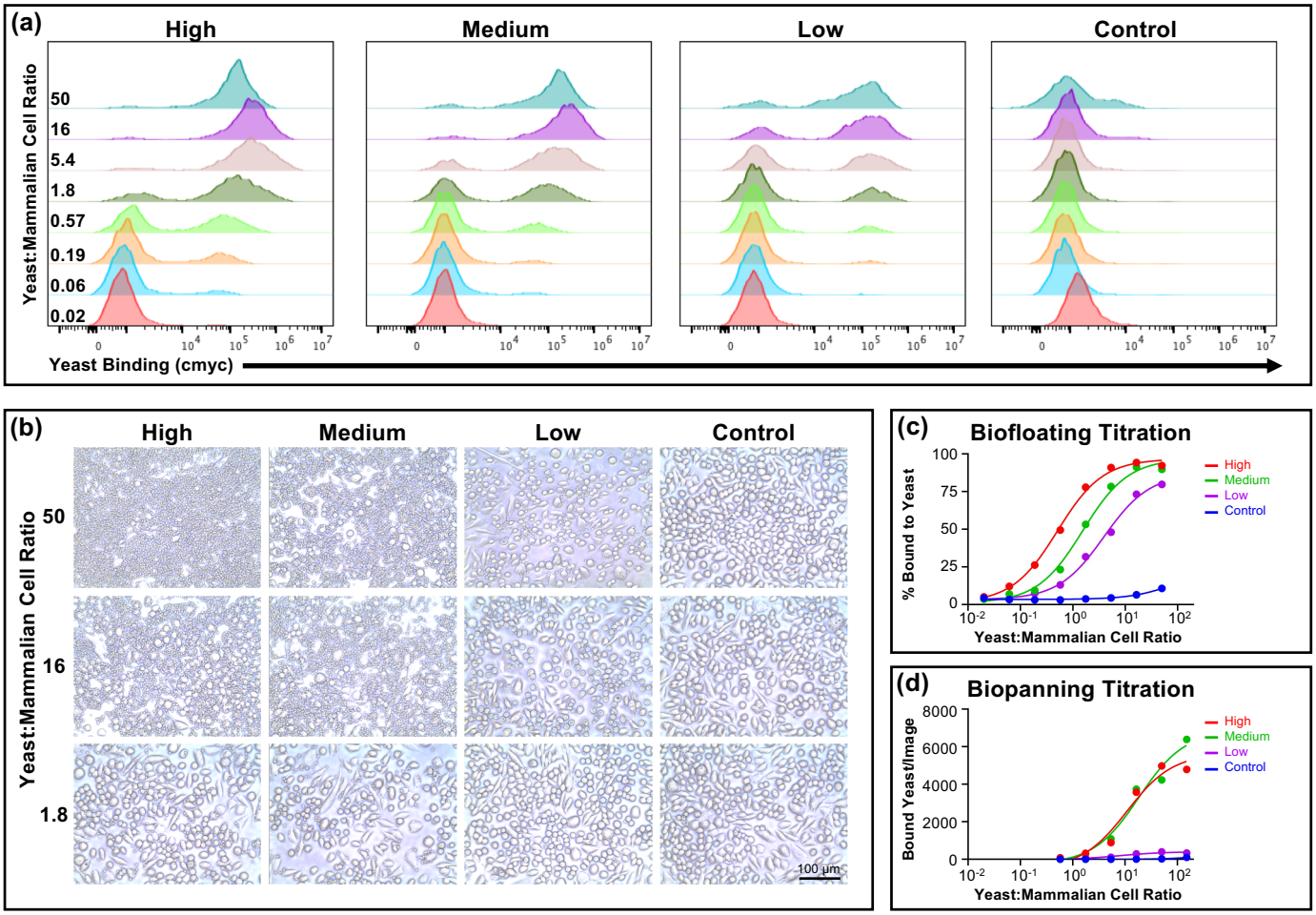

(a)
High
Medium
Low
Control
Yeast:Mammalian Cell Ratio
50
16
5.4
1.8
0.57
0.19
0.06
0.02
Yeast Binding (cmyc)
(b)
High
Medium
Low
Control
Yeast:Mammalian Cell Ratio
50
16
1.8
100 µm
(c)
Biofloating Titration
% Bound to Yeast
Yeast:Mammalian Cell Ratio
High
Medium
Low
Control
(d)
Biopanning Titration
Bound Yeast/Image
Yeast:Mammalian Cell Ratio
High
Medium
Low
Control

Figure 4

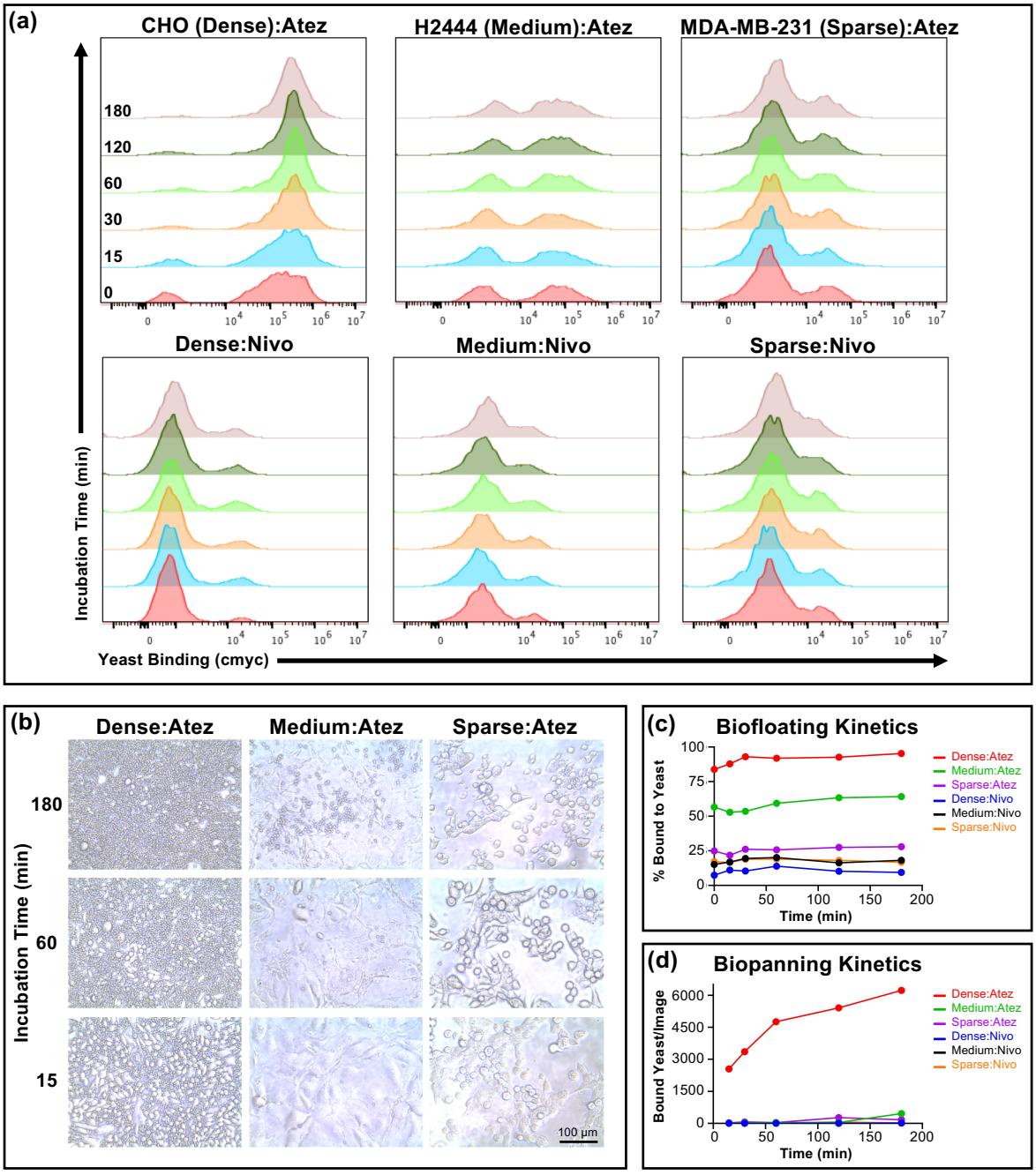

(a)
CHO (Dense):Atez
H2444 (Medium):Atez
MDA-MB-231 (Sparse):Atez
Dense:Nivo
Medium:Nivo
Sparse:Nivo
180
120
60
30
15
0
Incubation Time (min)
Yeast Binding (cmyc)
(b)
Dense:Atez
Medium:Atez
Sparse:Atez
Incubation Time (min)
100 µm
(c)
Biofloating Kinetics
% Bound to Yeast
Time (min)
Dense:Atez
Medium:Atez
Sparse:Atez
Dense:Nivo
Medium:Nivo
Sparse:Nivo
(d)
Biopanning Kinetics
Bound Yeast/Image
Time (min)

Figure 5

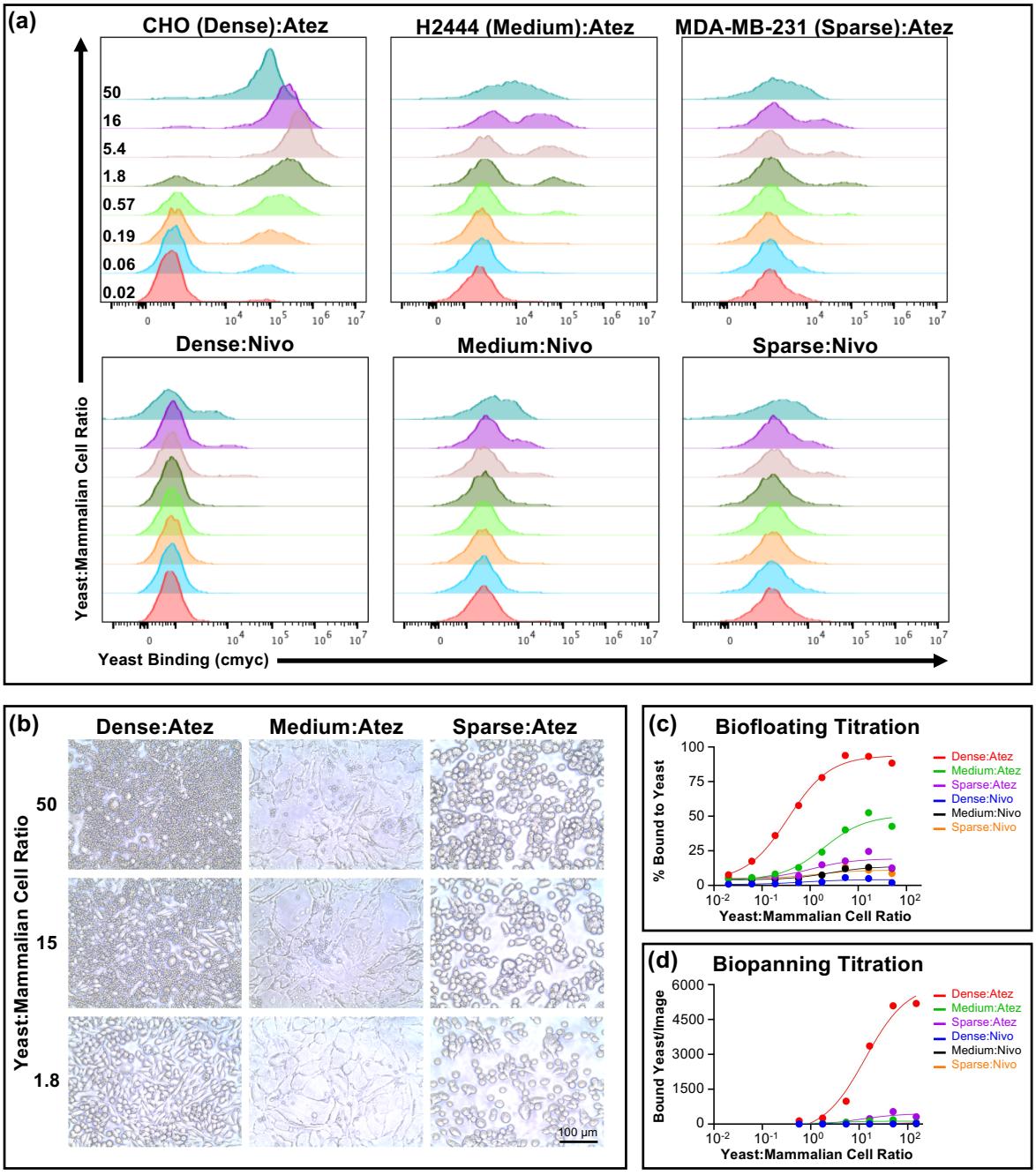

(a)
CHO (Dense):Atez
H2444 (Medium):Atez
MDA-MB-231 (Sparse):Atez
50
16
5.4
1.8
0.57
0.19
0.06
0.02
Dense:Nivo
Medium:Nivo
Sparse:Nivo
Yeast:Mammalian Cell Ratio
Yeast Binding (cmyc)
(b)
Dense:Atez
Medium:Atez
Sparse:Atez
50
15
1.8
Yeast:Mammalian Cell Ratio
100 µm
(c)
Biofloating Titration
% Bound to Yeast
Yeast:Mammalian Cell Ratio
Dense:Atez
Medium:Atez
Sparse:Atez
Dense:Nivo
Medium:Nivo
Sparse:Nivo
(d)
Biopanning Titration
Bound Yeast/Image
Yeast:Mammalian Cell Ratio
Dense:Atez
Medium:Atez
Sparse:Atez
Dense:Nivo
Medium:Nivo
Sparse:Nivo

Figure 6

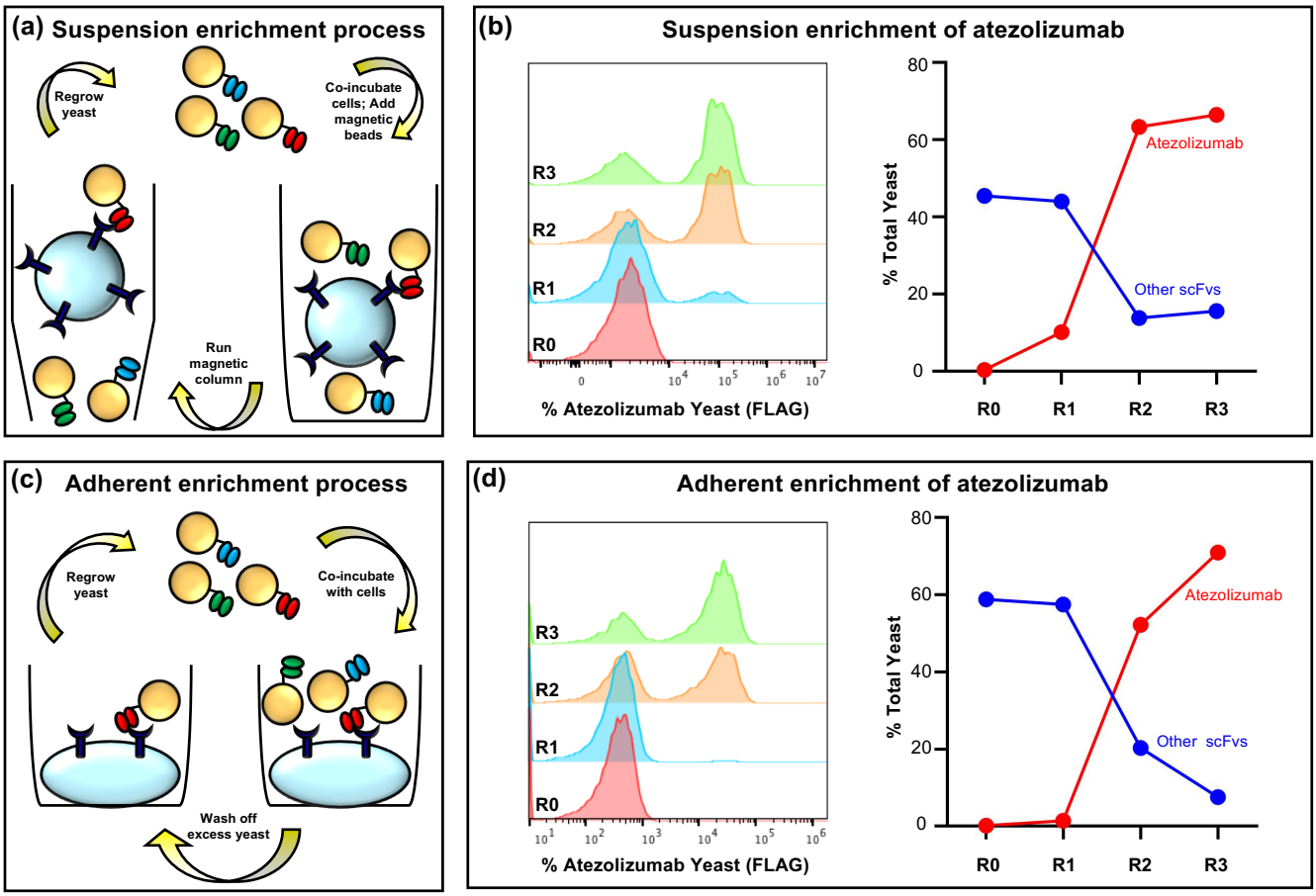

(a) Suspension enrichment process
Regrow yeast
Co-incubate cells; Add magnetic beads
Run magnetic column
(b)
Suspension enrichment of atezolizumab
R3
R2
R1
R0
% Atezolizumab Yeast (FLAG)
% Total Yeast
Atezolizumab
Other scFvs
R0
R1
R2
R3
(c) Adherent enrichment process
Regrow yeast
Co-incubate with cells
Wash off excess yeast
(d)
Adherent enrichment of atezolizumab
R3
R2
R1
R0
% Atezolizumab Yeast (FLAG)
% Total Yeast
Atezolizumab
Other scFvs
R0
R1
R2
R3

Figure S1

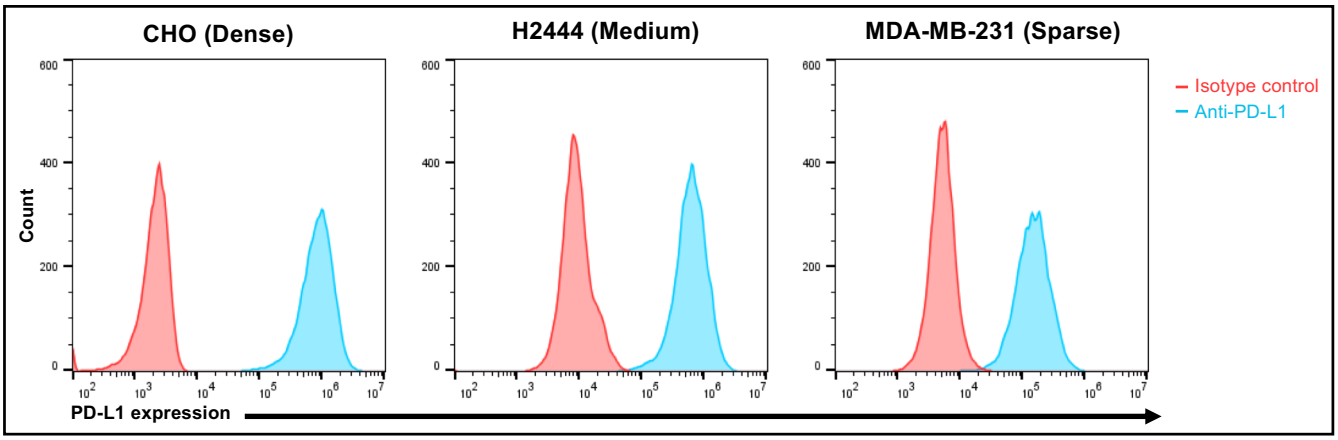
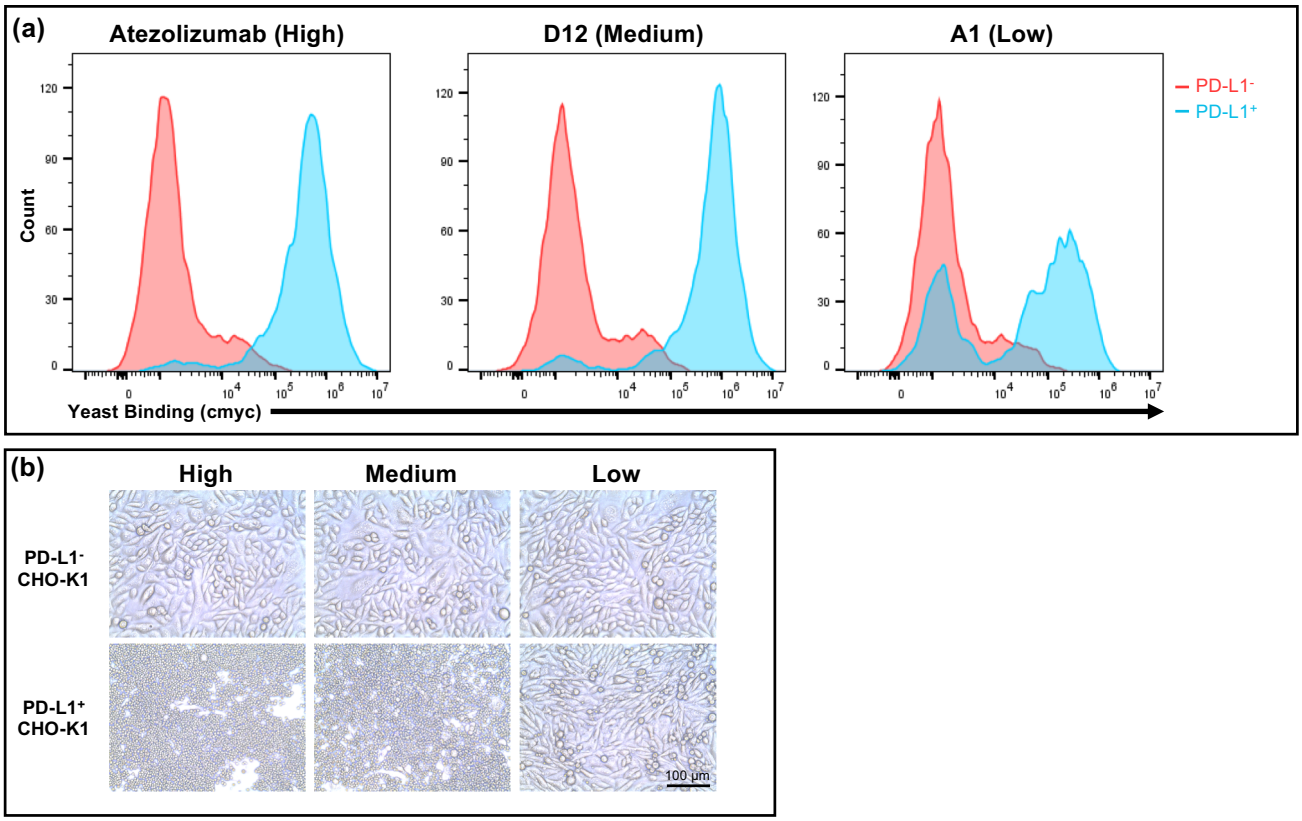

CHO (Dense)
H2444 (Medium)
MDA-MB-231 (Sparse)
Count
PD-L1 expression
Isotype control
Anti-PD-L1

Figure S2


(a)
Atezolizumab (High)
D12 (Medium)
A1 (Low)
PD-L1-
PD-L1+
Count
Yeast Binding (cmyc)
(b)
High
Medium
Low
PD-L1- CHO-K1
PD-L1+ CHO-K1
100 μm