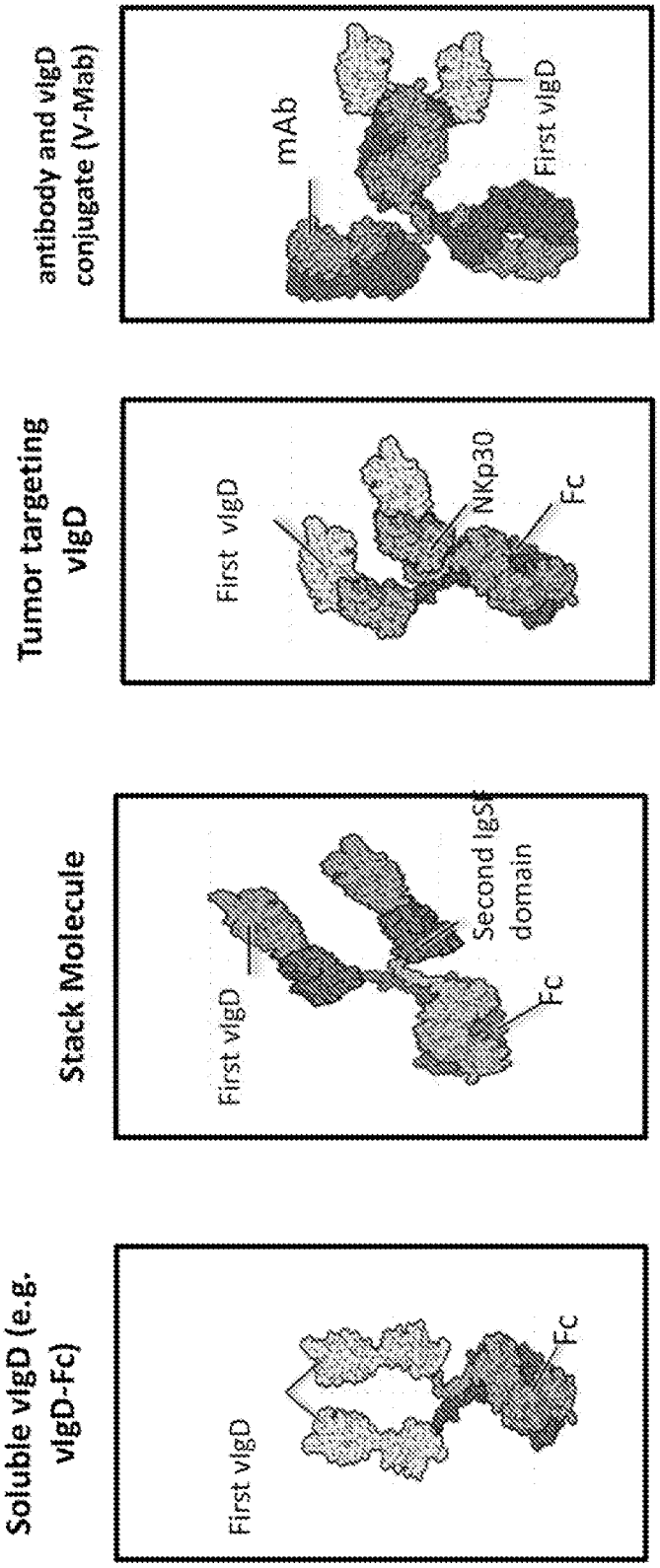
FIG. 1A


Soluble vIgD (e.g. vIgD-Fc)
First vIgD
Fc
Stack Molecule
First vIgD
Second IgSF domain
Fc
Tumor targeting vIgD
First vIgD
NKp30
Fc
antibody and vIgD conjugate (V-Mab)
mAb
First vIgD

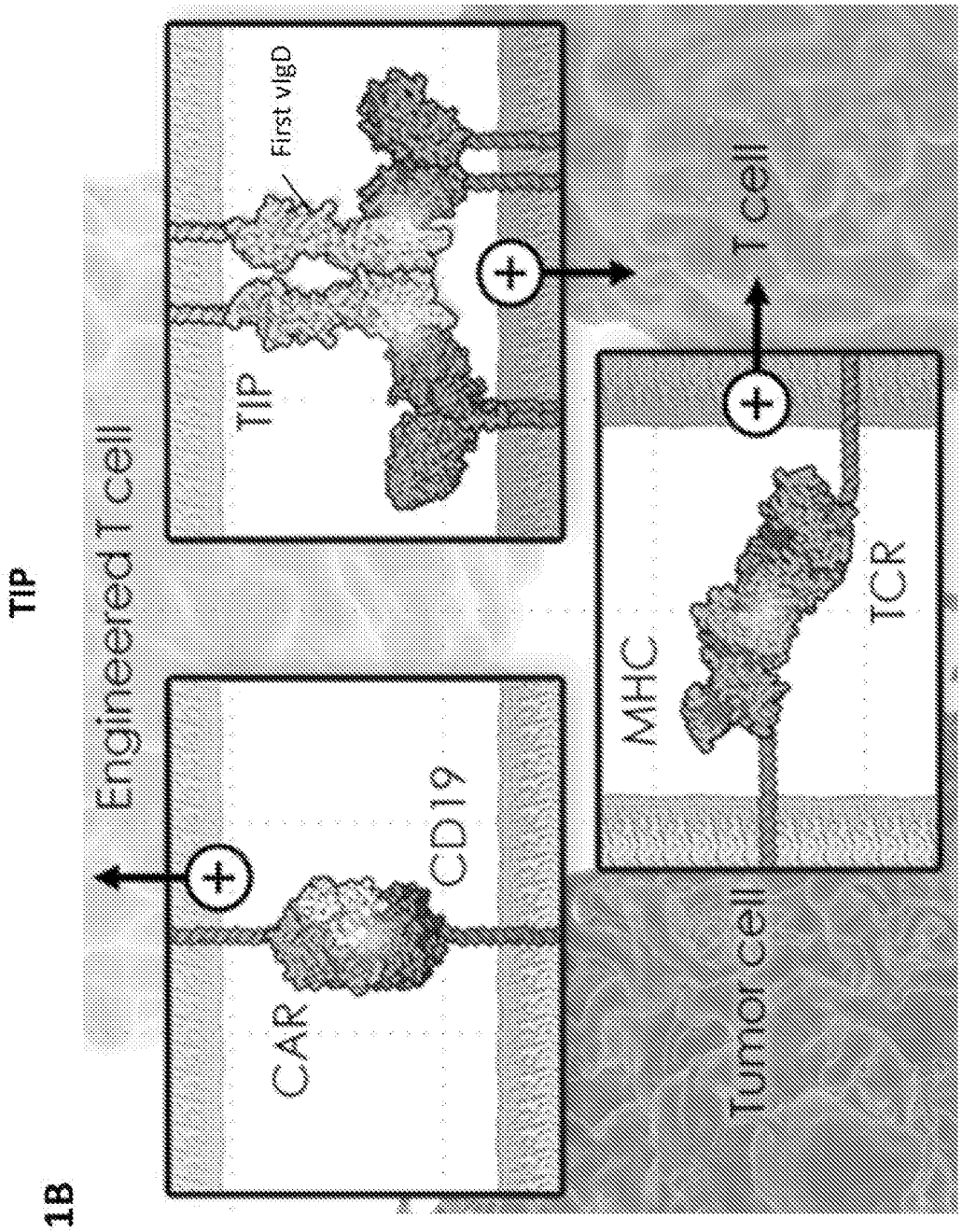

TIP
Engineered T cell
CAR
CD19
TIP
First vIgD
T cell
MHC
TCR
Tumor cell

FIG. 1B

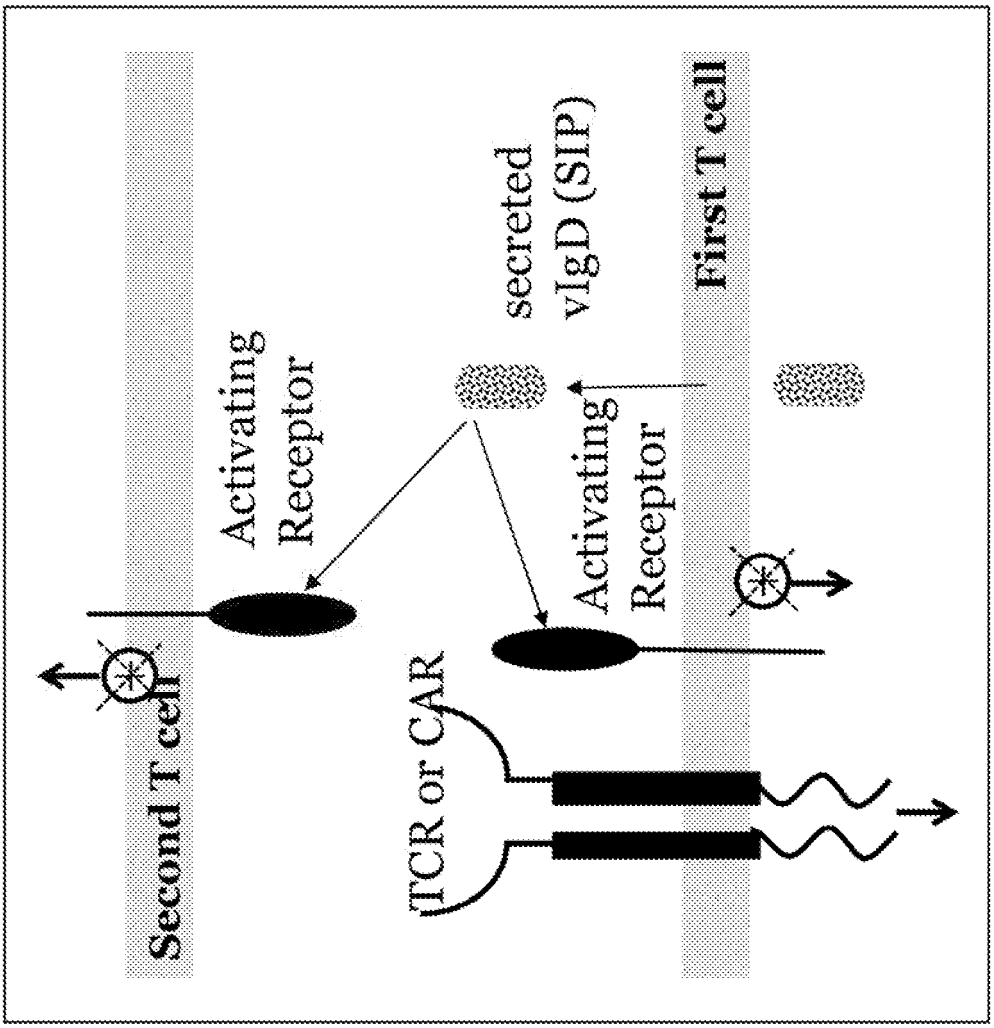

Second T cell
Activating Receptor
secreted vIgD (SIP)
First T cell
Activating Receptor
iTCR or CAR

FIG. 1C

FIG. 2

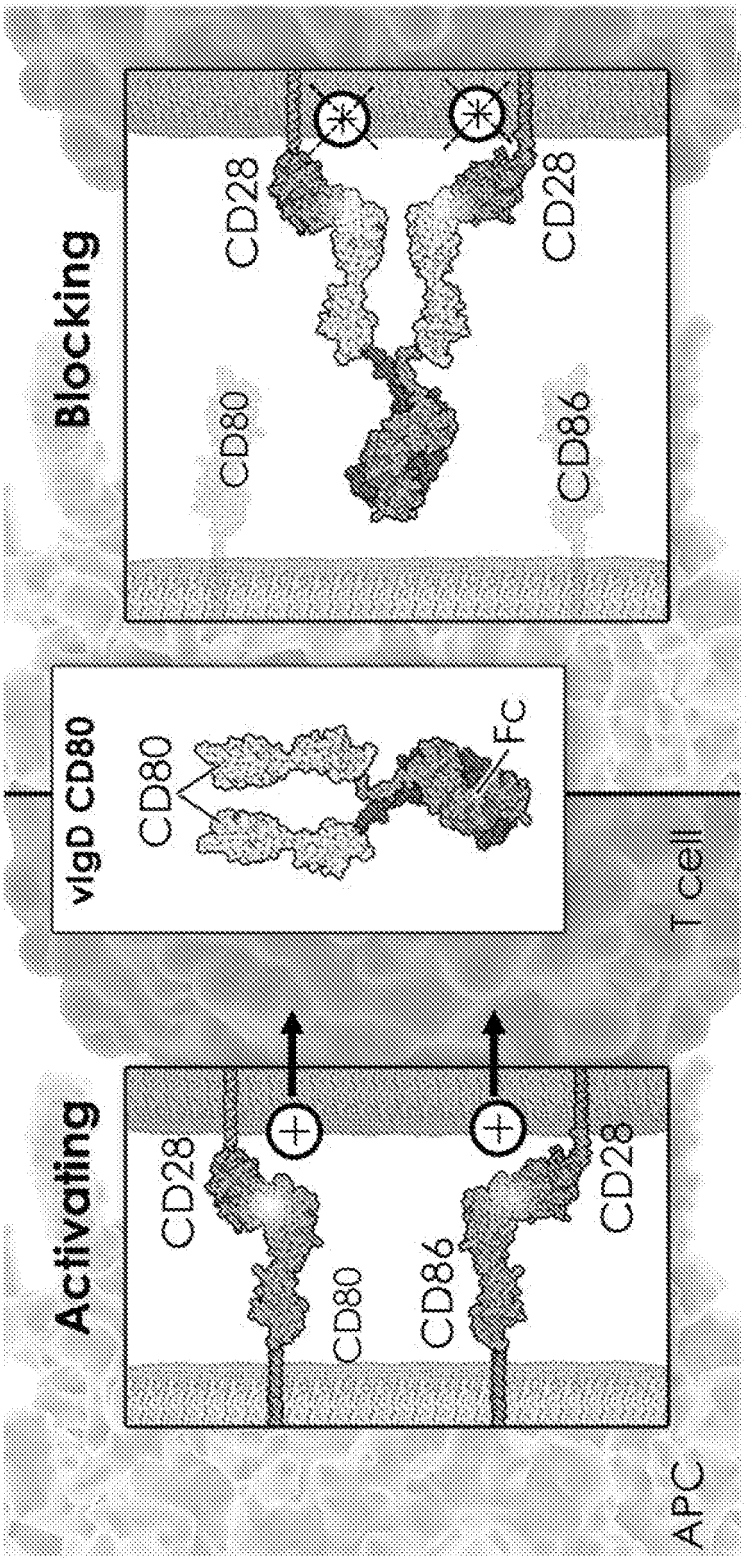

Activating
CD28
CD80
CD86
CD28
APC
vIgD CD80
CD80
Fc
T cell
Blocking
CD28
CD80
CD28
CD86

FIG. 3

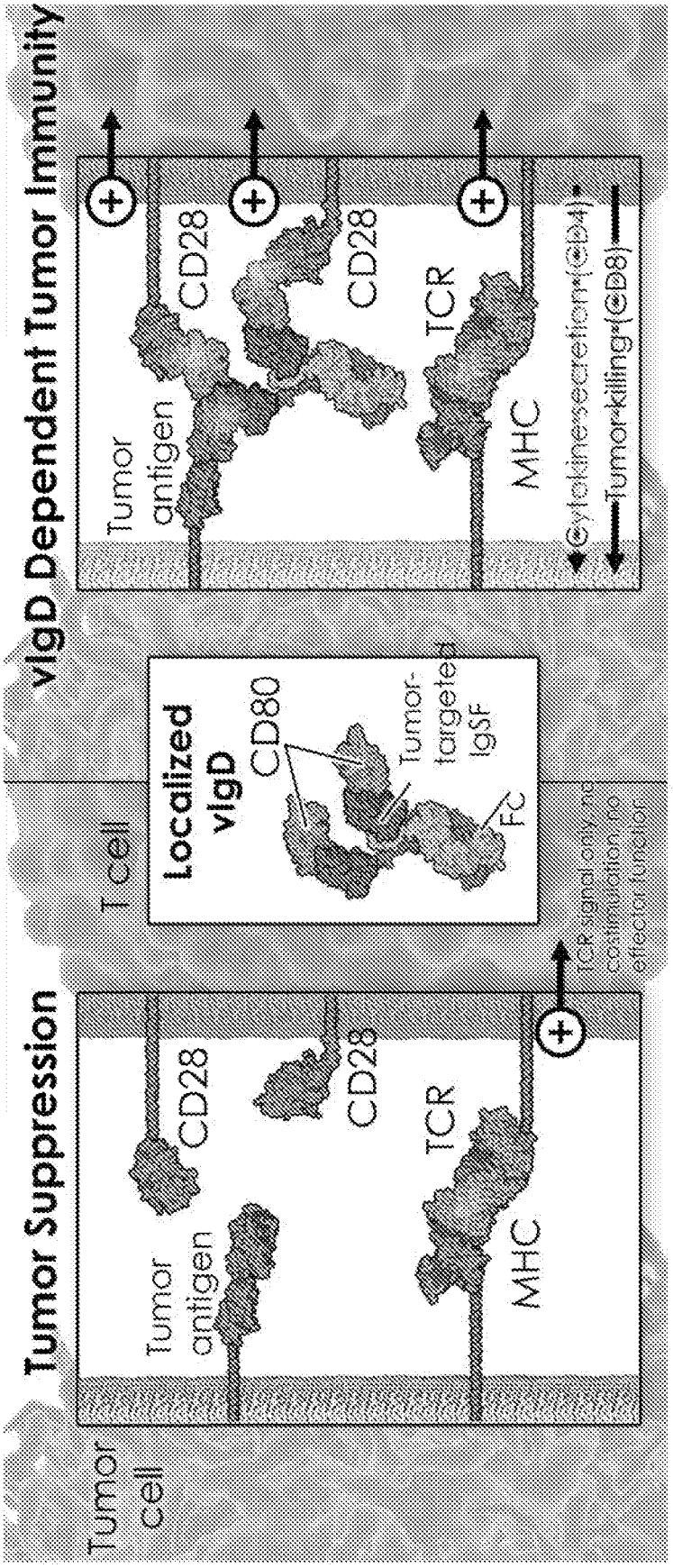

vIgD Dependent Tumor Immunity
Tumor Suppression
Tumor cell
Tumor antigen
CD28
CD28
TCR
MHC
T Cell
Localized vIgD
CD80
Tumor-targeted IgSF
FC
TCR signal only, no costimulation, no effector function
Tumor antigen
CD28
CD28
TCR
MHC
cytokines secretion(CD4)
Tumor killing(CD8)

FIG. 4

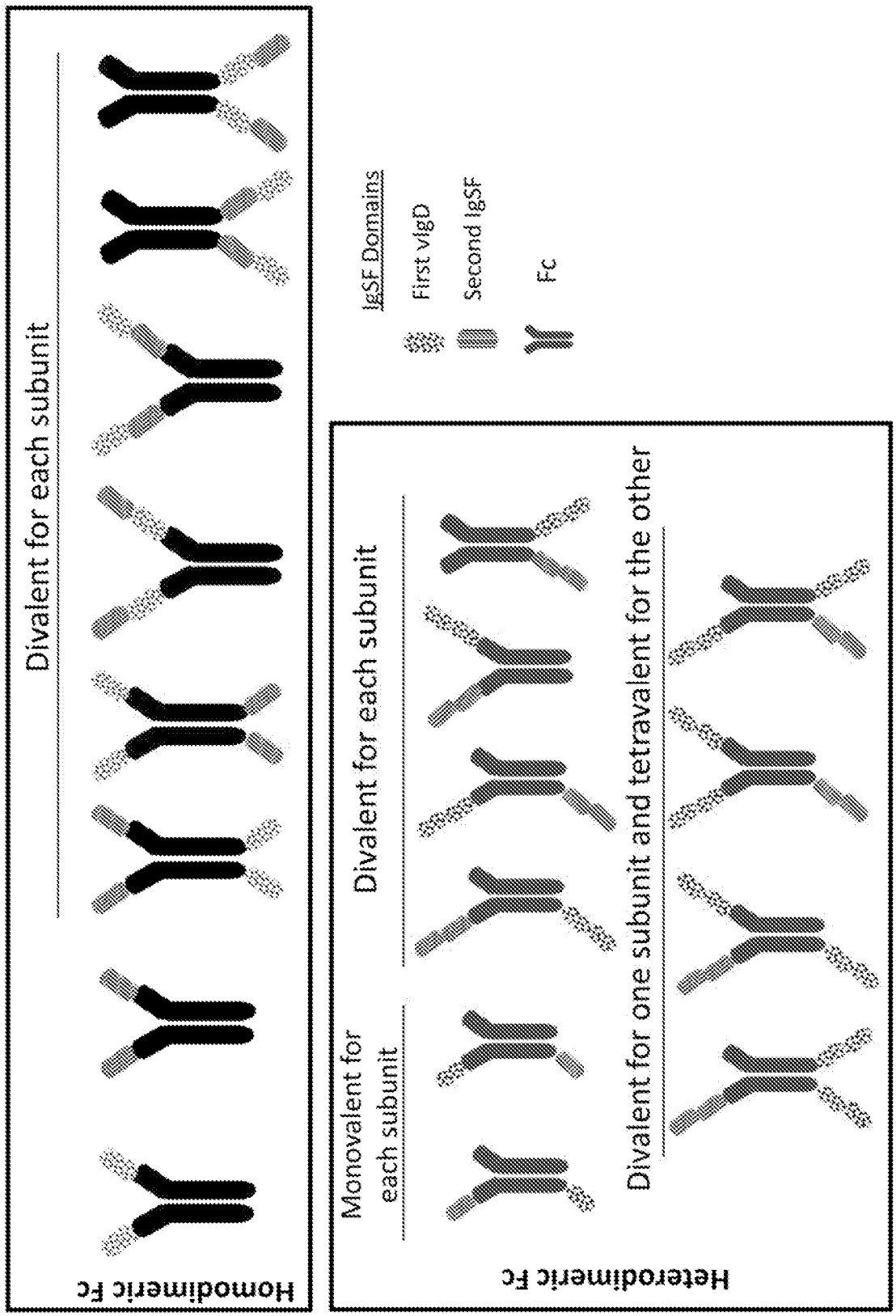

Homodimeric Fc
Divalent for each subunit
IgSF Domains
First vIgD
Second IgSF
Fc
Heterodimeric Fc
Monovalent for each subunit
Divalent for each subunit
Divalent for one subunit and tetravalent for the other

FIG. 5

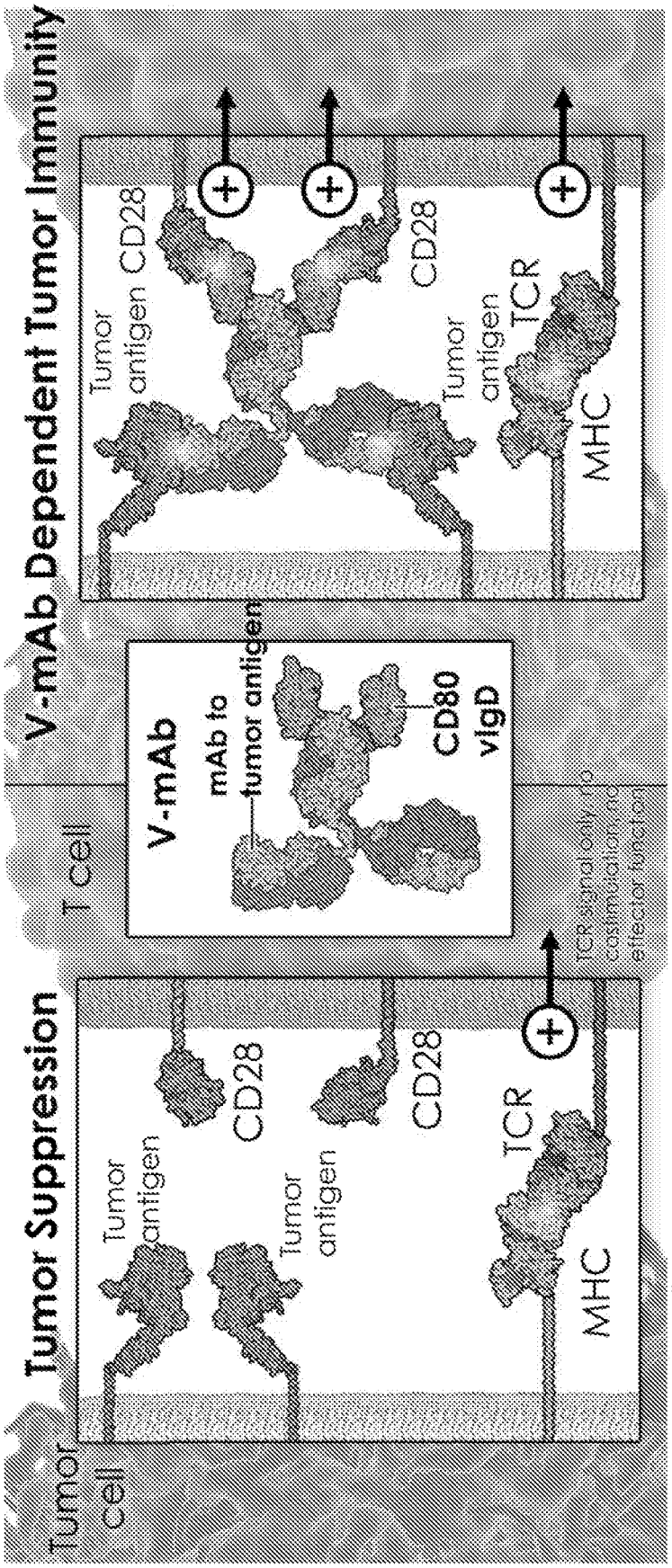

Tumor Suppression
V-mAb Dependent Tumor Immunity
Tumor cell
T cell
Tumor antigen
CD28
TCR
MHC
V-mAb
mAb to tumor antigen
CD80 vIgD
TCR signaling, co-stimulation and effector function

FIG. 6A

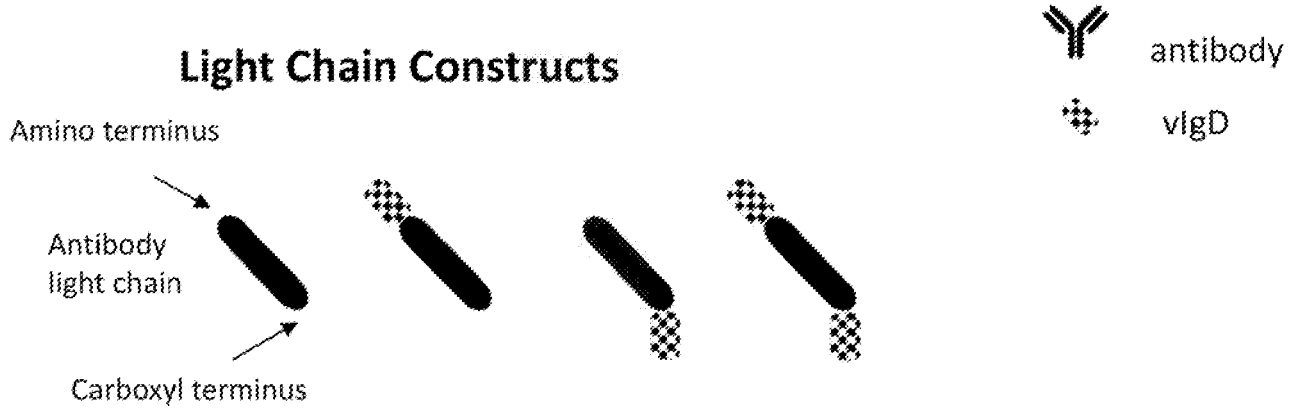
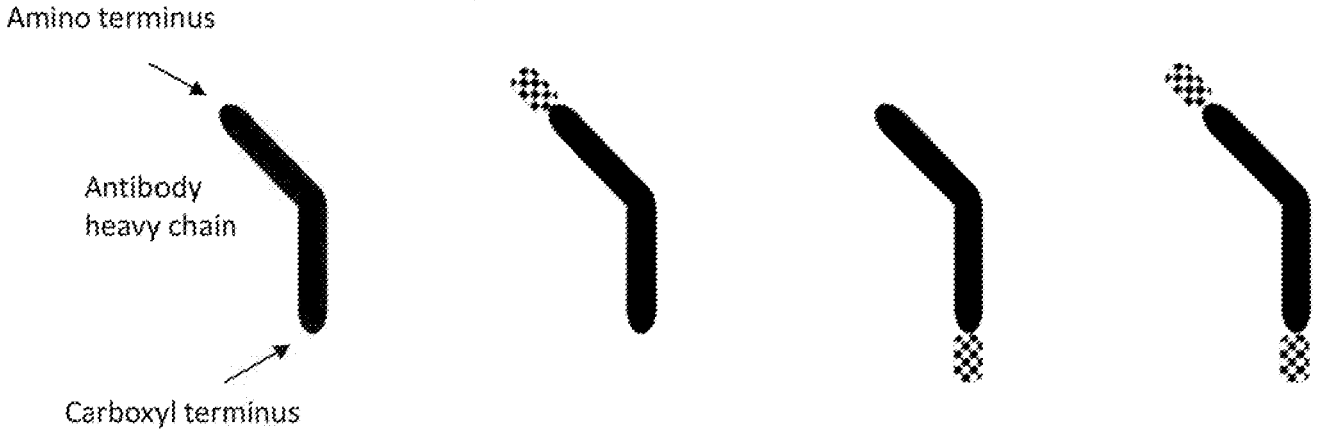

Light Chain Constructs
Amino terminus
Antibody
light chain
Carboxyl terminus
antibody
vIgD

FIG. 6B


Heavy Chain Constructs
Amino terminus
Antibody
heavy chain
Carboxyl terminus

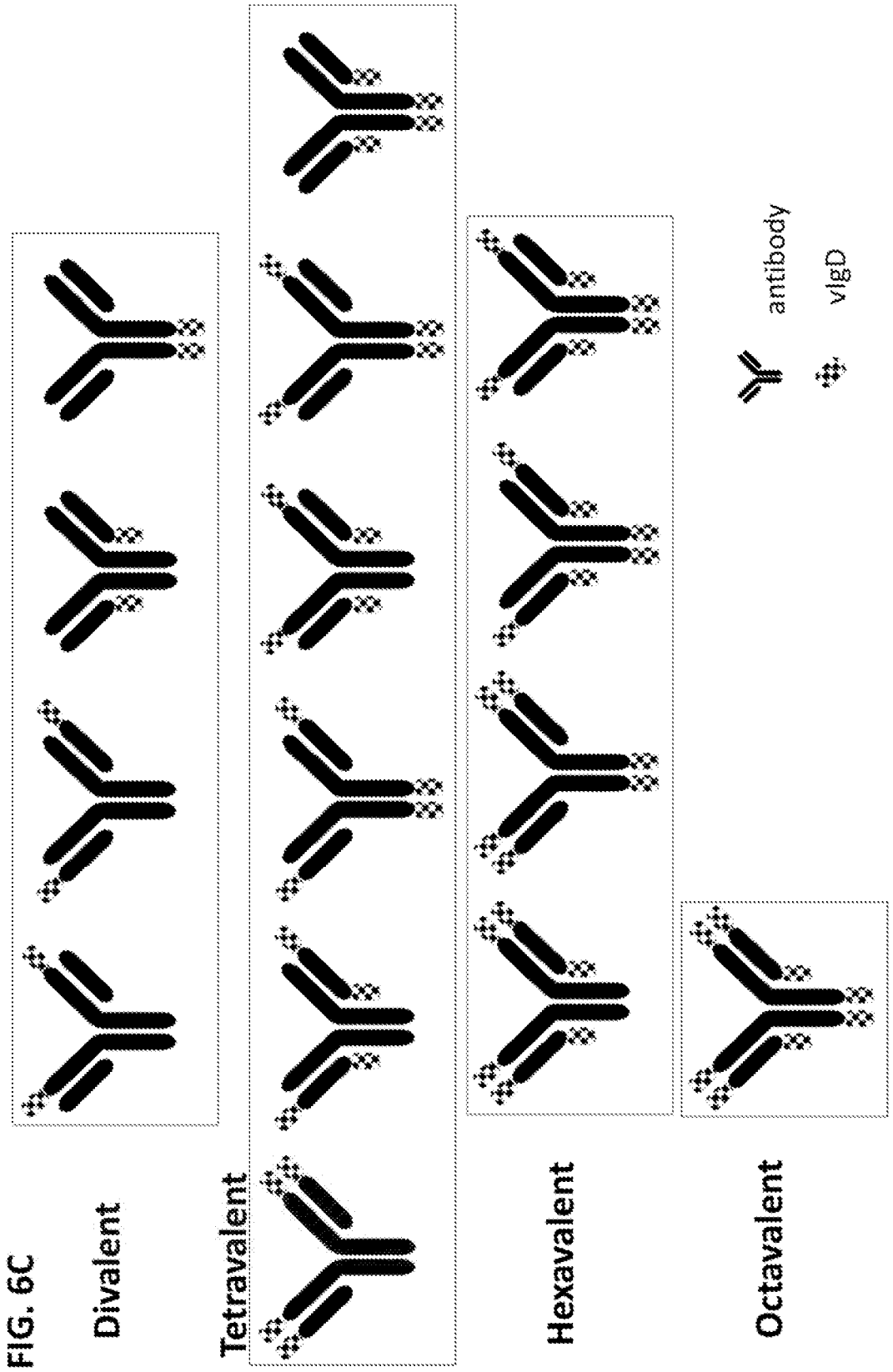


FIG. 6C
Divalent
Tetravalent
Hexavalent
Octavalent
antibody
vIgD

FIG. 7A

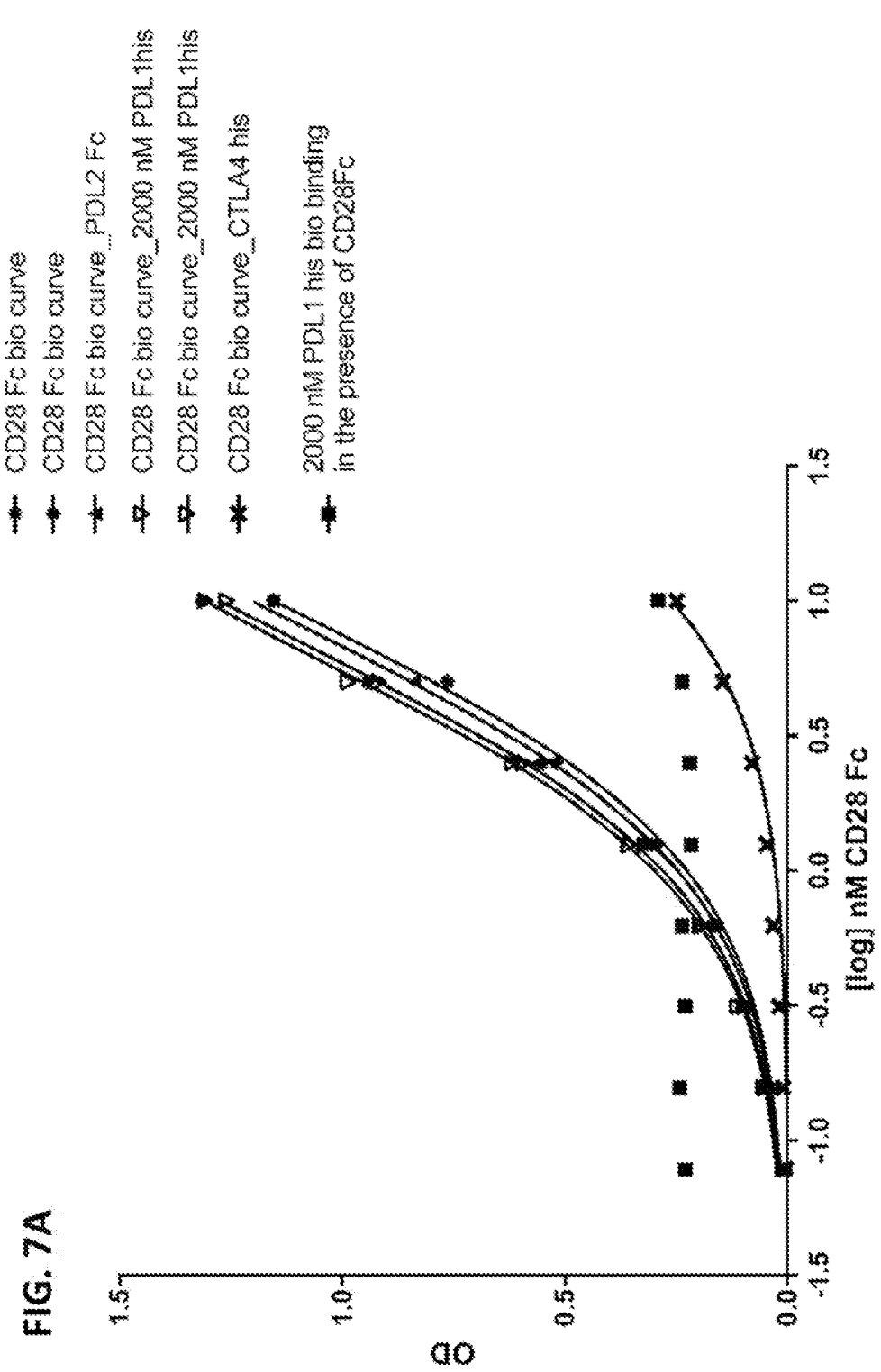

CD28 Fc bio curve
CD28 Fc bio curve
CD28 Fc bio curve_PDL2 Fc
CD28 Fc bio curve_2000 nM PDL1his
CD28 Fc bio curve_2000 nM PDL1his
CD28 Fc bio curve_CTLA4 his
2000 nM PDL1 his bio binding in the presence of CD28Fc
OD
1.5
1.0
0.5
0.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
[log] nM CD28 Fc

FIG. 7B

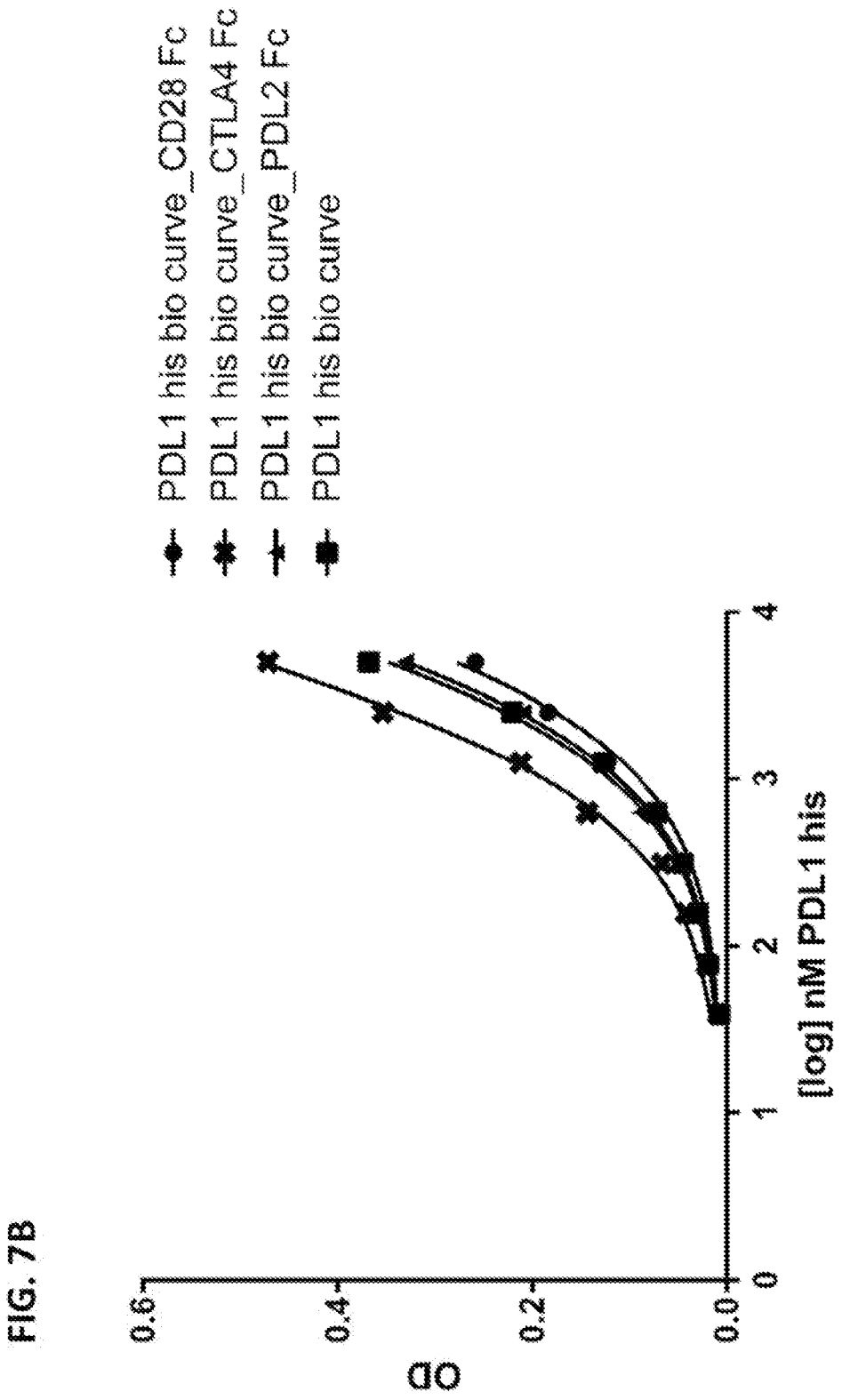
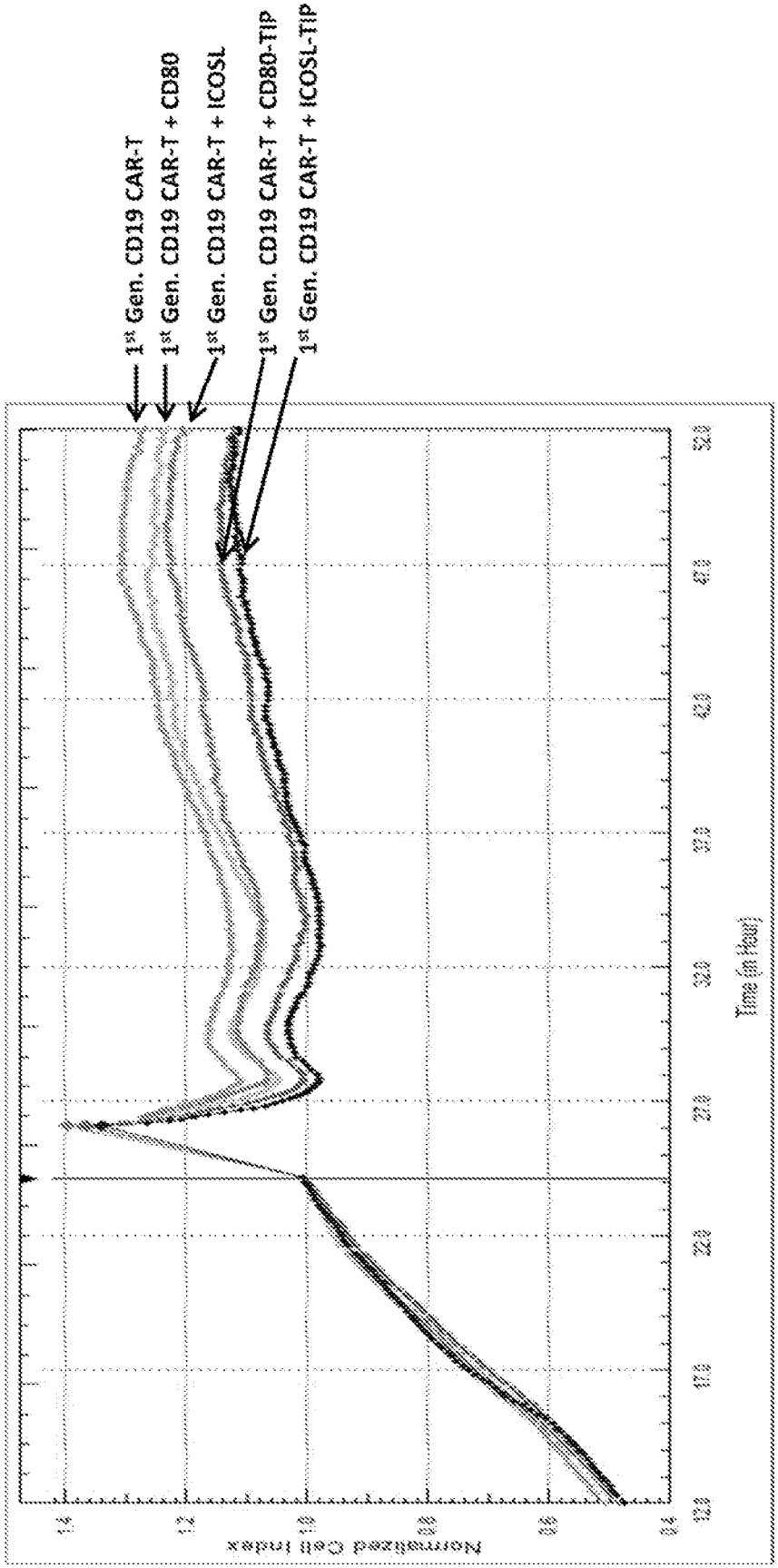

PDL1 his bio curve_CD28 Fc
PDL1 his bio curve_CTLA4 Fc
PDL1 his bio curve_PDL2 Fc
PDL1 his bio curve
OD
0.0
0.2
0.4
0.6
0
1
2
3
4
[log] nM PDL1 his

FIG. 8


1st Gen. CD19 CAR-T
1st Gen. CD19 CAR-T + CD80
1st Gen. CD19 CAR-T + ICOSL
1st Gen. CD19 CAR-T + CD80-TIP
1st Gen. CD19 CAR-T + ICOSL-TIP
Normalized Cell Index
Time (in Hour)