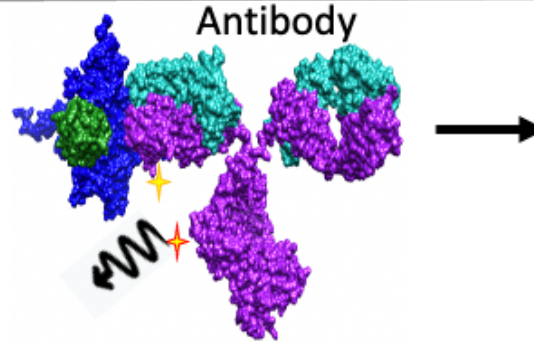
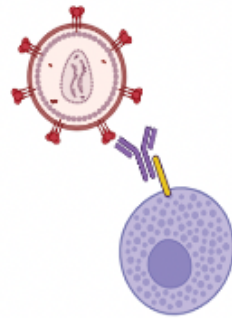
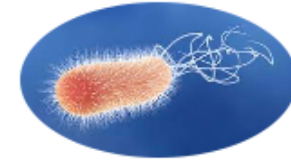


Integrating imaging modalities for spatiotemporal characterization of Antibody – Microbe Dynamics (Bacteria and Viruses)

Virus
(HIV-1)



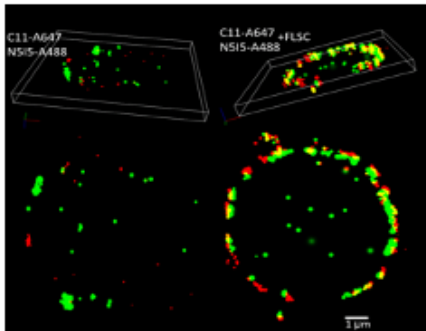
Clinical Patient isolates



Bacteria

Microscopy

Super-resolution



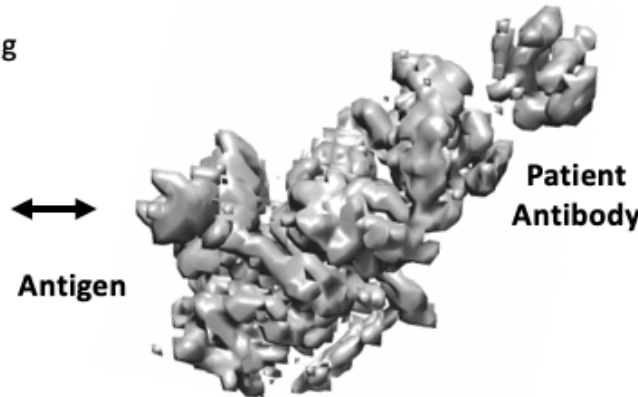
Ab – Ag – Cell

Mass Spectrometry Imaging
MSI



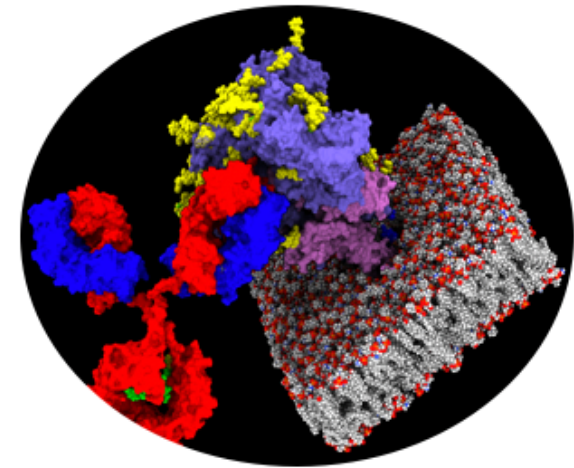
Bacterial
Infected
Lung

CryoEM



- Vaccine FLSC - Phase I complete
- Whole Patient Antibodies
- Antigen-induced Antibody Effector Function

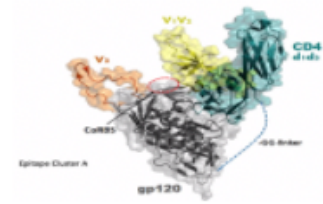
Molecular Dynamics



Antigen-Antibody
Molecular Dynamics

CryoEM complexes of FSLC & HIV-1 Patient Antibodies

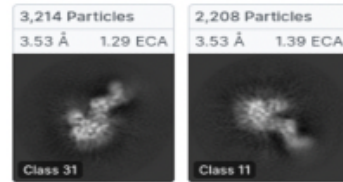
FLSC Model



FLSC/ IHV01 – Patient Ab's

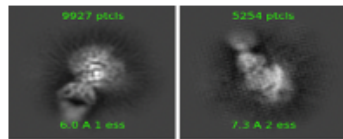
CoRBs

N12i2-FLSC/IHV01

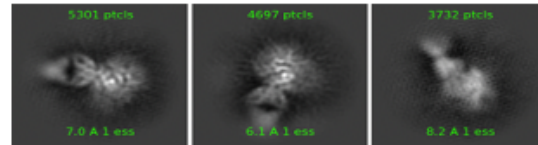


Cluster A

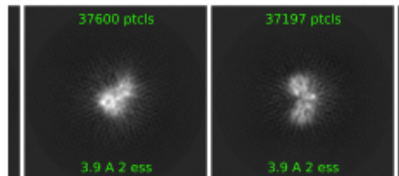
N5i5^{wt} / FLSC



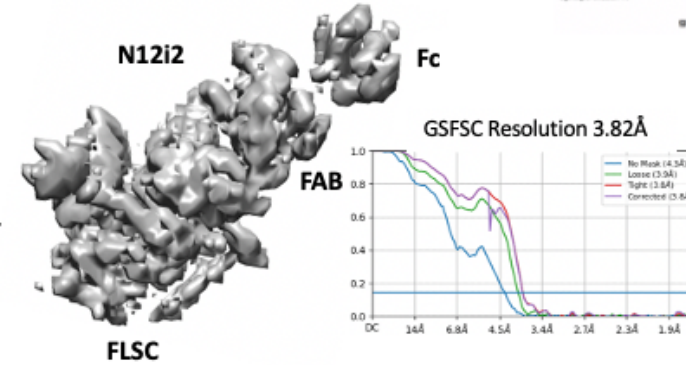
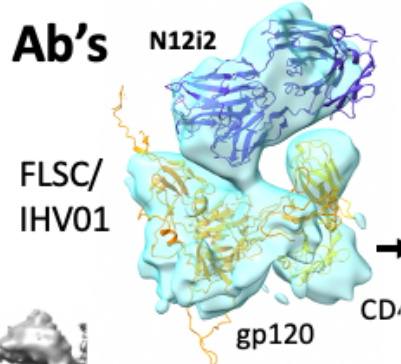
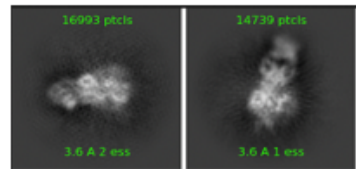
N5i5^{LALA} /FLSC



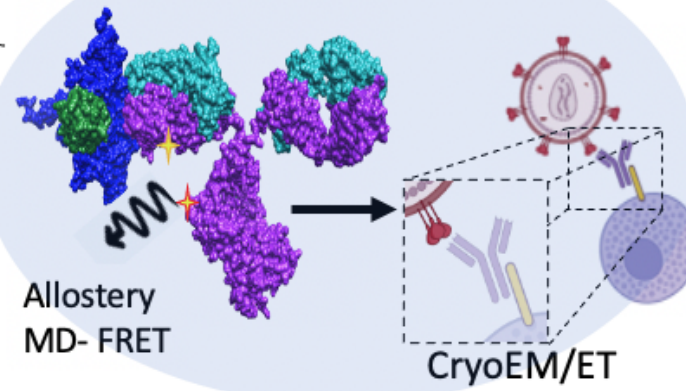
830A/FLSC



Novel protective Ab - FLSC



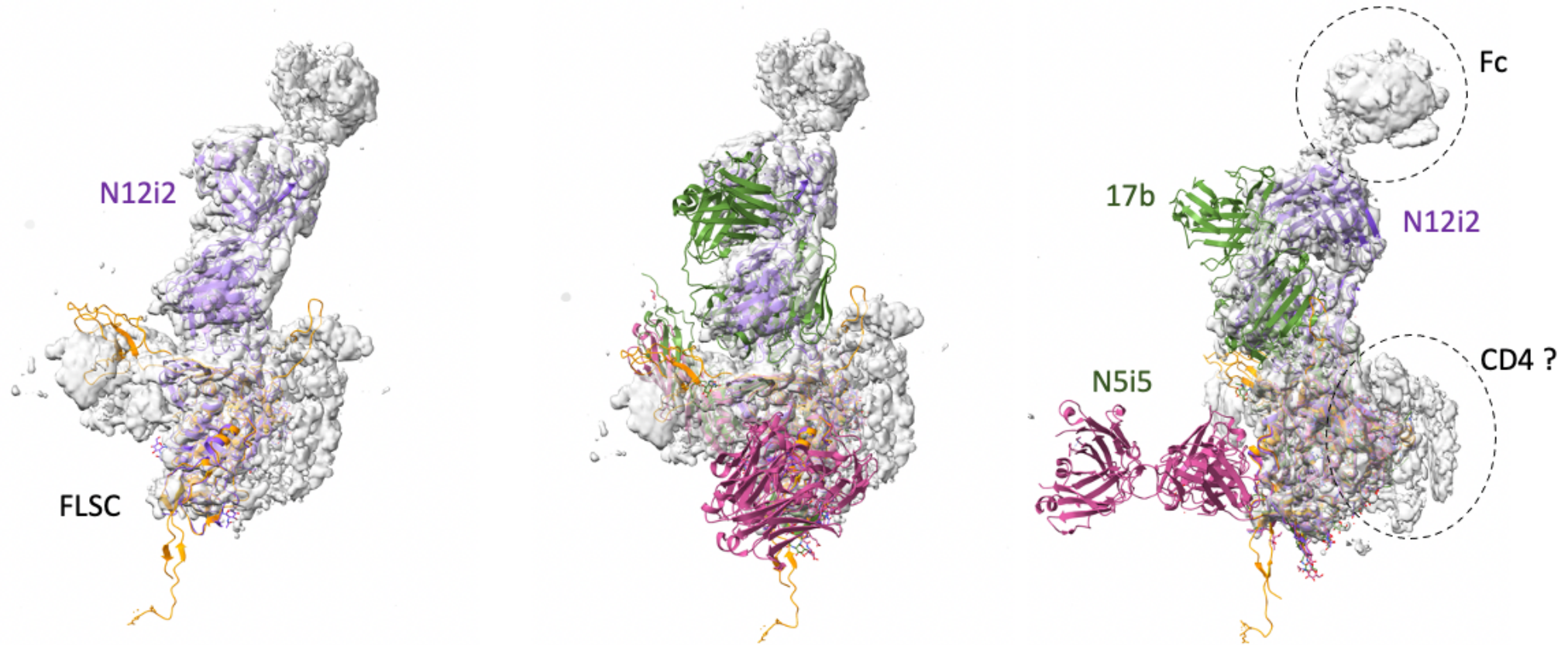
Ag-Ab-Fc dynamics



Ray, Sajadi, Lewis, Snyder unpublished

N12i2 – FLSC – Map 3.8Å –GSFSC (unmasked – map – docking)

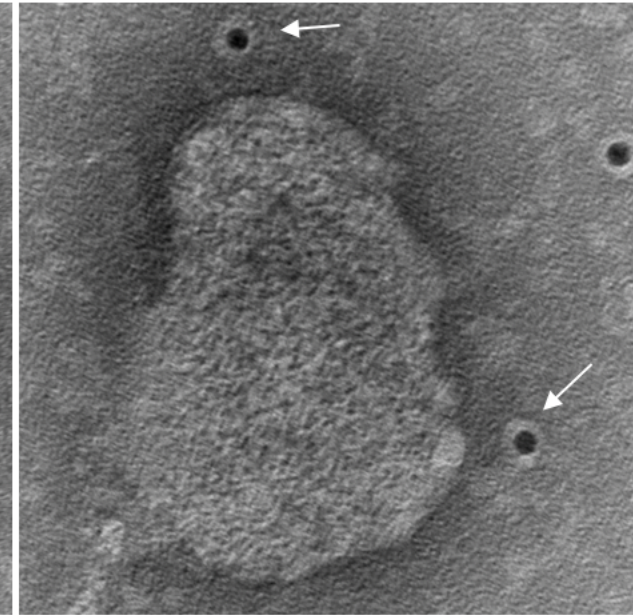
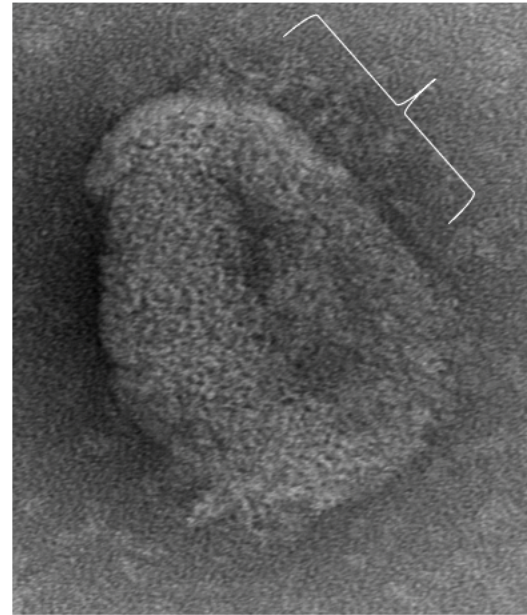
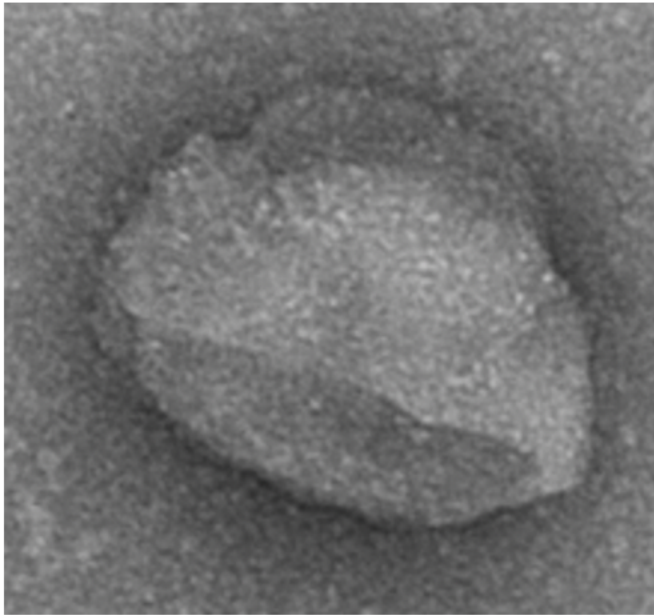
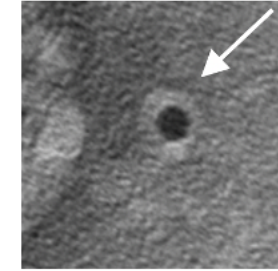
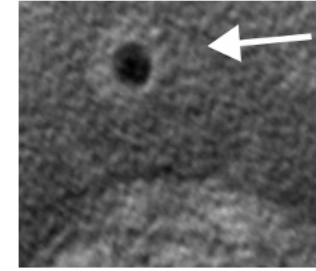
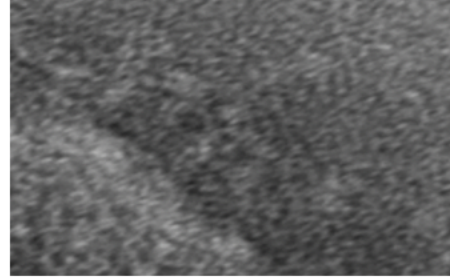
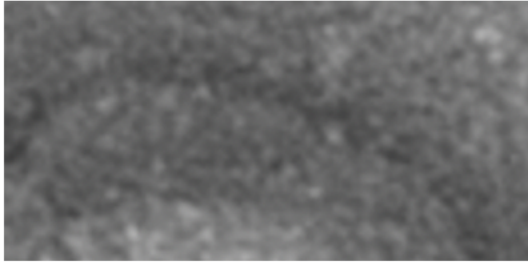
- 1) dock FLSC bal CD4i triggered model (GL)
- 2) independent docking of single H and L chain N12i2 but not control 17b or N5i5 (different epitope)
- 3) LSQ align 4H8W, 1rzj, 6w4M to map docked FLSC bal CD4i model only
- 4) CD4 D1/D2 linked docking fails in the absence of FLSC, FAB docked models – trying with pre-docked FLSC/FAB,
- 5) evaluate and check for inversions
- 6) morph/rebuild of loops (V1/V2, V3, CD4



4h8w- N5i5 - Crystal structure of non-neutralizing and ADCC-potent antibody N5-i5 in complex with HIV-1 clade A/E gp120 and sCD4.
1rzj – 17b - HIV-1 HXBC2 GP120 ENVELOPE GLYCOPROTEIN COMPLEXED WITH CD4 AND INDUCED NEUTRALIZING ANTIBODY 17B
6w4m – N12i2 + HIV-1 CLADE A/E GP120 + M48U1

Negative stain

AT-2 Inactivated virus + PGT121 Ab + 5nm Au – Protein A/G



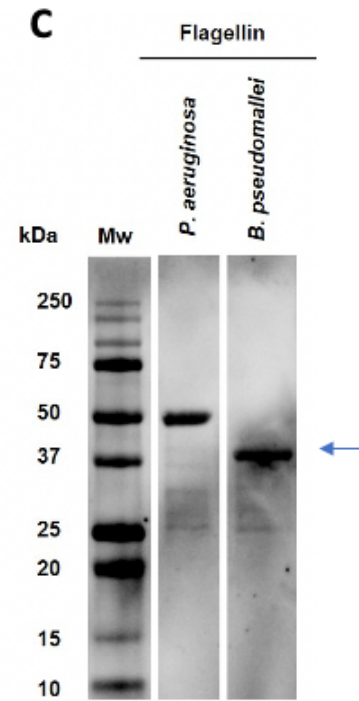
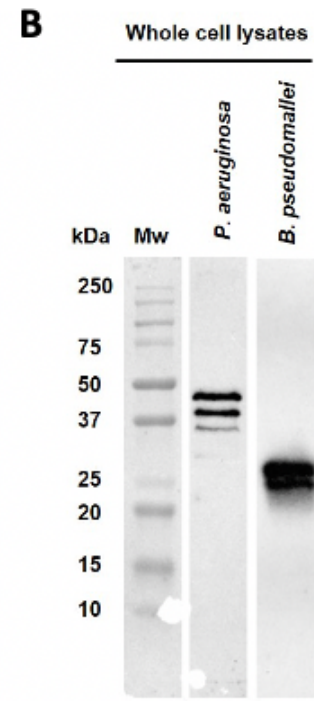
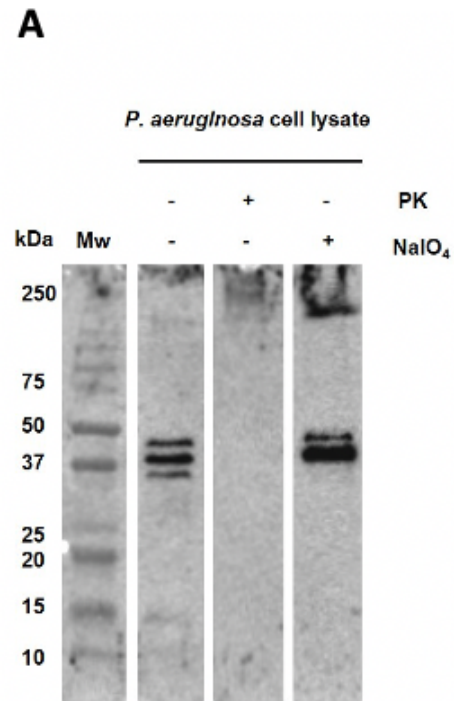
AT2 + Protein A/G – Au
(Ctrl)

AT2 + PGT121-Plant

AT2 + PGT121-Plant + ProA/G-
Au 5nm

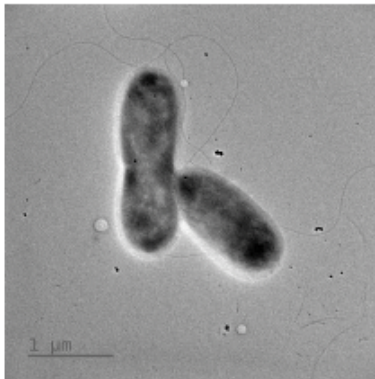
Uranyl Formate

Project 2 Bacterial-Ab interaction

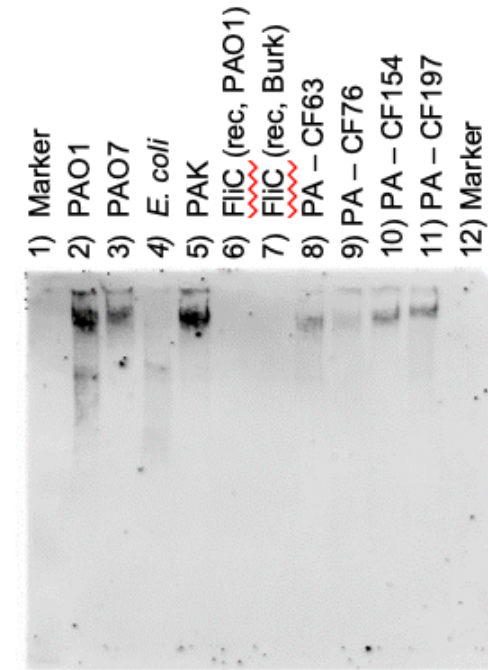
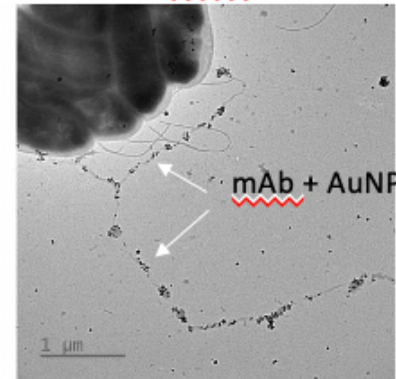
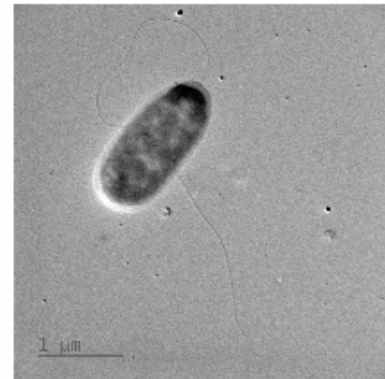


SDS-PAGE
mAb

D PBS



Isotype control



mAb (1: 500)

Native PAGE
(7.5% gel BIORAD)