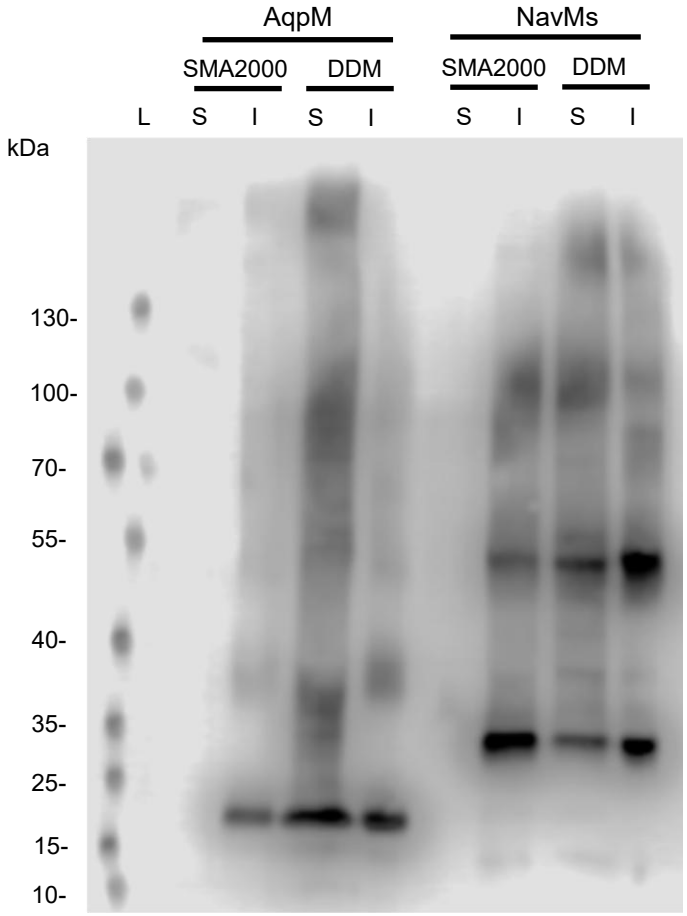


Figure 1. Western blot of soluble (S) and insoluble (I) fractions of AqpM and NavMs solubilised with SMA2000, and the traditional detergent, DDM. No bands are seen in the S fraction for SMA2000, while the total band intensity (S + I) is higher in DDM samples than in the SMA2000 samples.

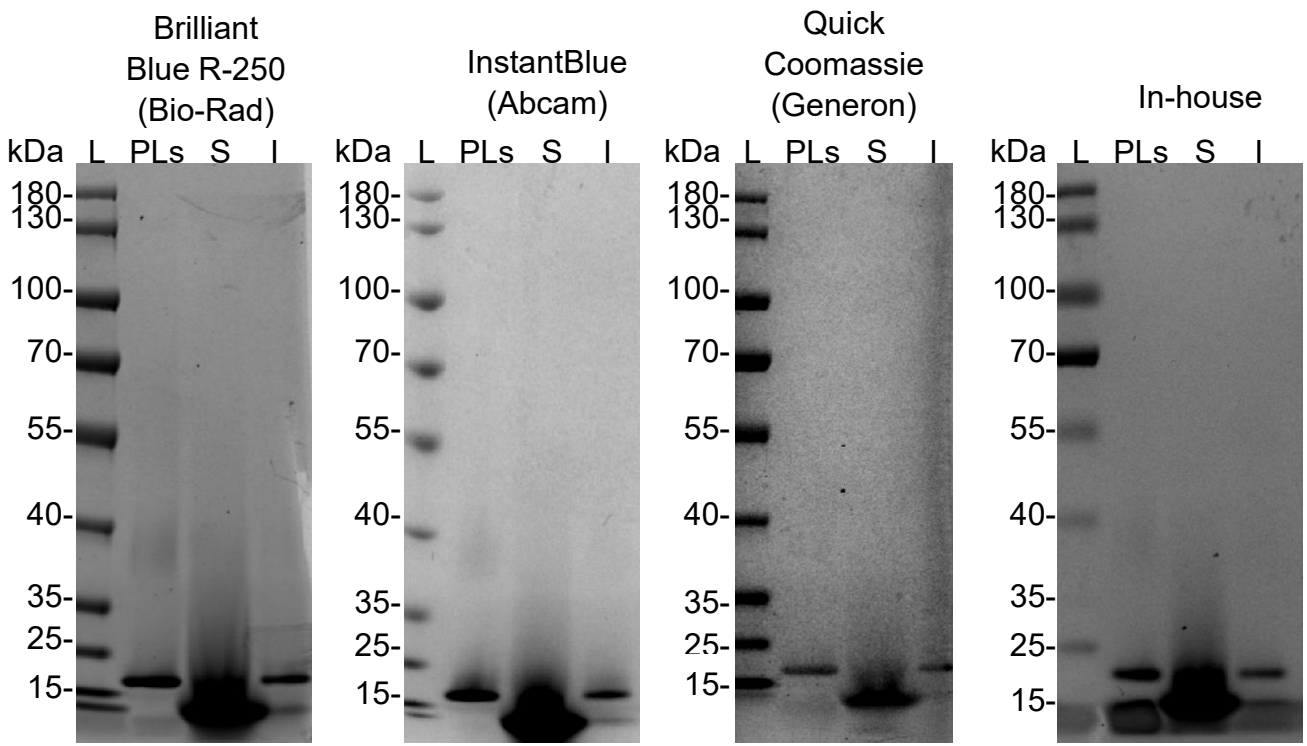


Figure 2. A Comparison of Coomassie Stains. POPE:POPG (75:25 w:w) AqpZ proteoliposomes were solubilised with 2.5% w/v SMA2000. Proteoliposome (PLs), soluble (S), and insoluble (I) fractions were separated on a 12% SDS-PAGE gel and were stained with one of three commercial Coomassie stains (Brilliant Blue R-250 Bio-Rad, InstantBlue® Abcam, Quick Coomassie Generon) or a stain made in-house. A smear is seen in the soluble fraction for SMA2000, but not in the PL or I lanes irrespective of the stain used.

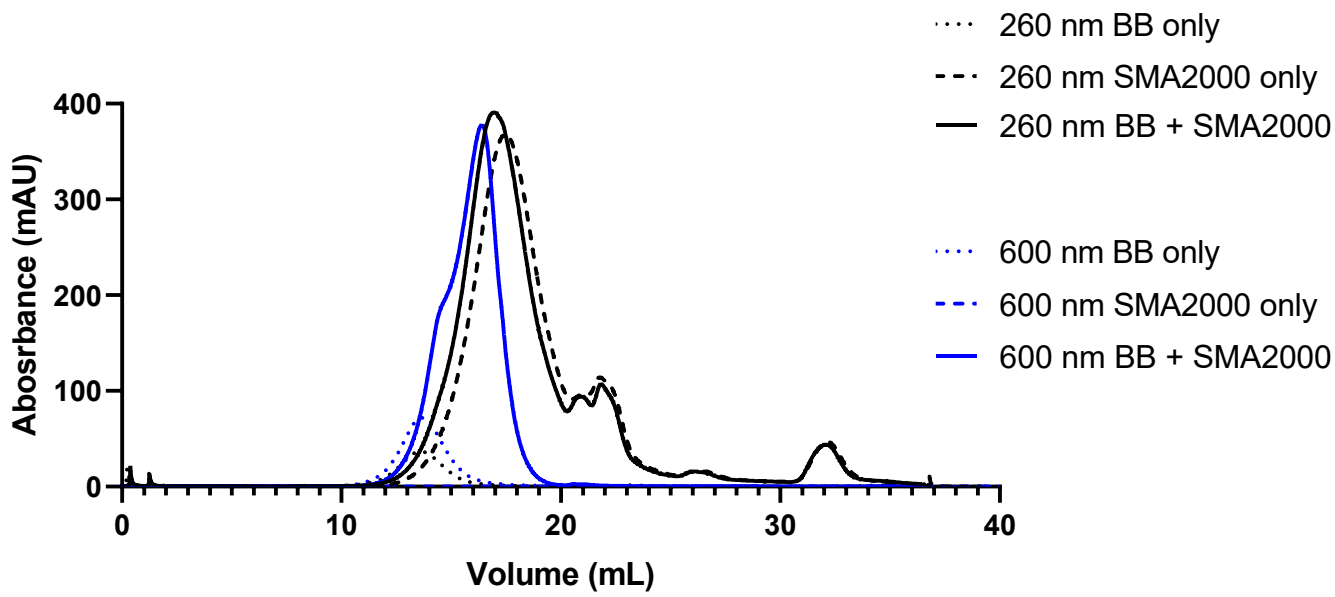


Figure 3. Size exclusion chromatogram of Coomassie Brilliant Blue (BB), SMA2000, and Coomassie Brilliant Blue mixed with SMA2000. Samples were separated on a Superdex 200 increase 300/10 GL (Cytiva). A difference in the elution profile is seen for samples containing both Coomassie Brilliant Blue and SMA2000 compared to when analysed individually.

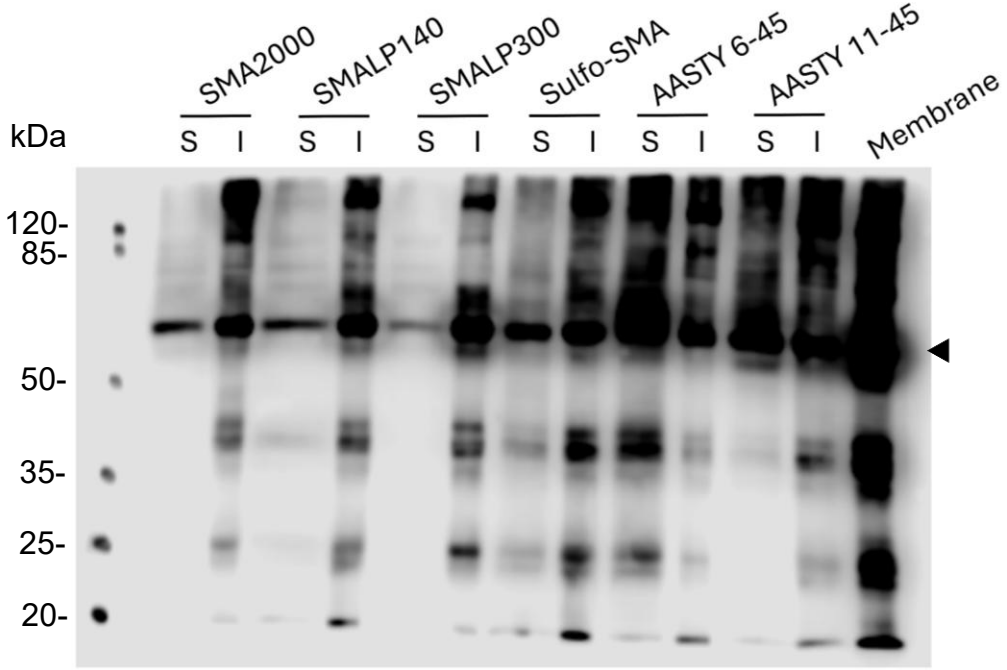


Figure 4. Soluble (S) and insoluble (I) fractions of tcPho89 solubilised with SMA2000 and a range of commercially available polymers. A seemingly constant banding pattern is seen across all the insoluble fractions, but varying banding patterns are seen across the soluble fractions.

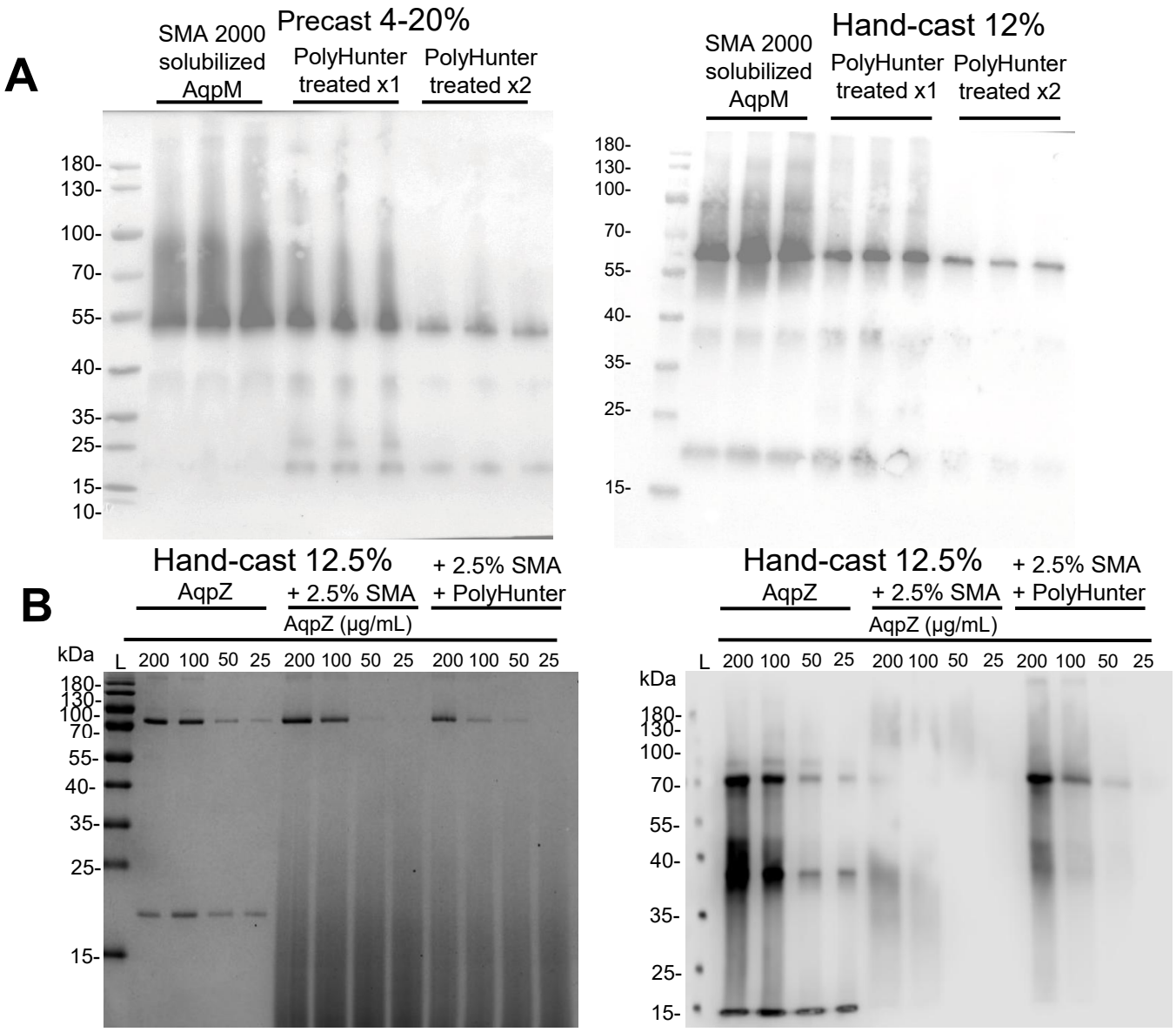


Figure 5. The effect of PolyHunter resin on SMA2000-containing samples. (A) Western blots of AqpM solubilised with SMA2000 and treatm PolyHunter resin. (B) Western blot and Coomassie stained SDS-PAGE of DDM-purified AqpM, with a final concentration of 2.5% SMA2000 bef after treatment with PolyHunter resin. Removal of free polymer using PolyHunter resin reduced background smearing and improved quality of electrophoresis analysis

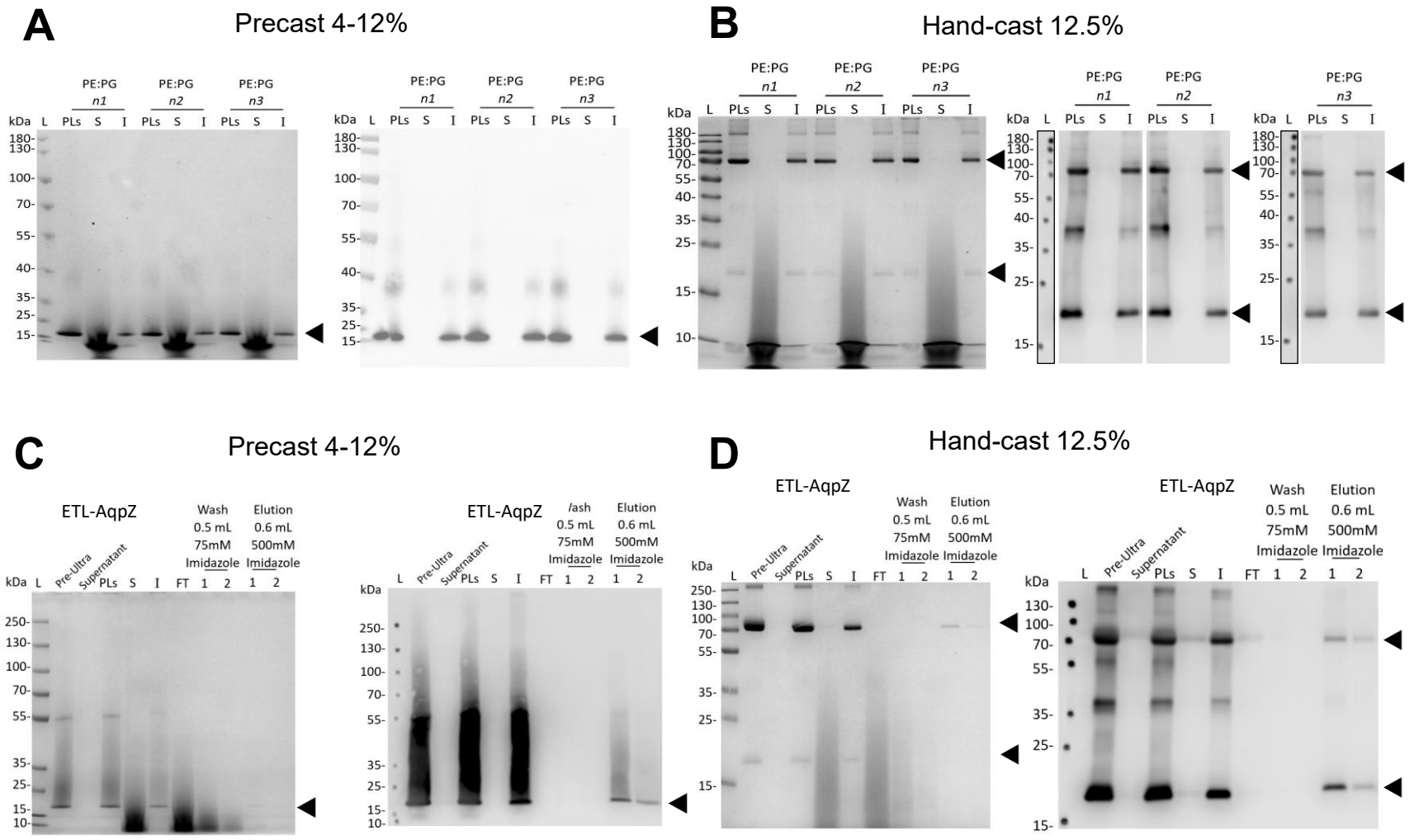


Figure 6. A comparison of Pre-cast and Hand-cast Gels. AqpZ proteoliposomes (PLs) made with POPE:POPG (75:25 w:w) (top) or *E. coli* tota were solubilised with 2.5% w/v SMA2000 and separated into soluble (S) and insoluble (I) fractions. The soluble fraction from *E. coli* total lipid extra purified by Ni^{2+}-IMAC. Samples were separated on both precast 4-12% gradient gels and 12.5% hand-cast gels; gels were Coomassie stained an blot probed with an anti-His antibody. Arrows indicate the AqpZ monomer (25 kDa) and the AqpZ tetramer (100 kDa). PE:PG liposomes, S and I fr 12% precast gel or (B) 12.5% hand-cast gel stained with Coomassie and analysed by Western blot (For whole western blot images, see Supplem liposomes, S and I fractions analysed on a (C) 4-12% precast gel or (D) 12.5% hand-cast gel stained with Coomassie and analysed by Western bl

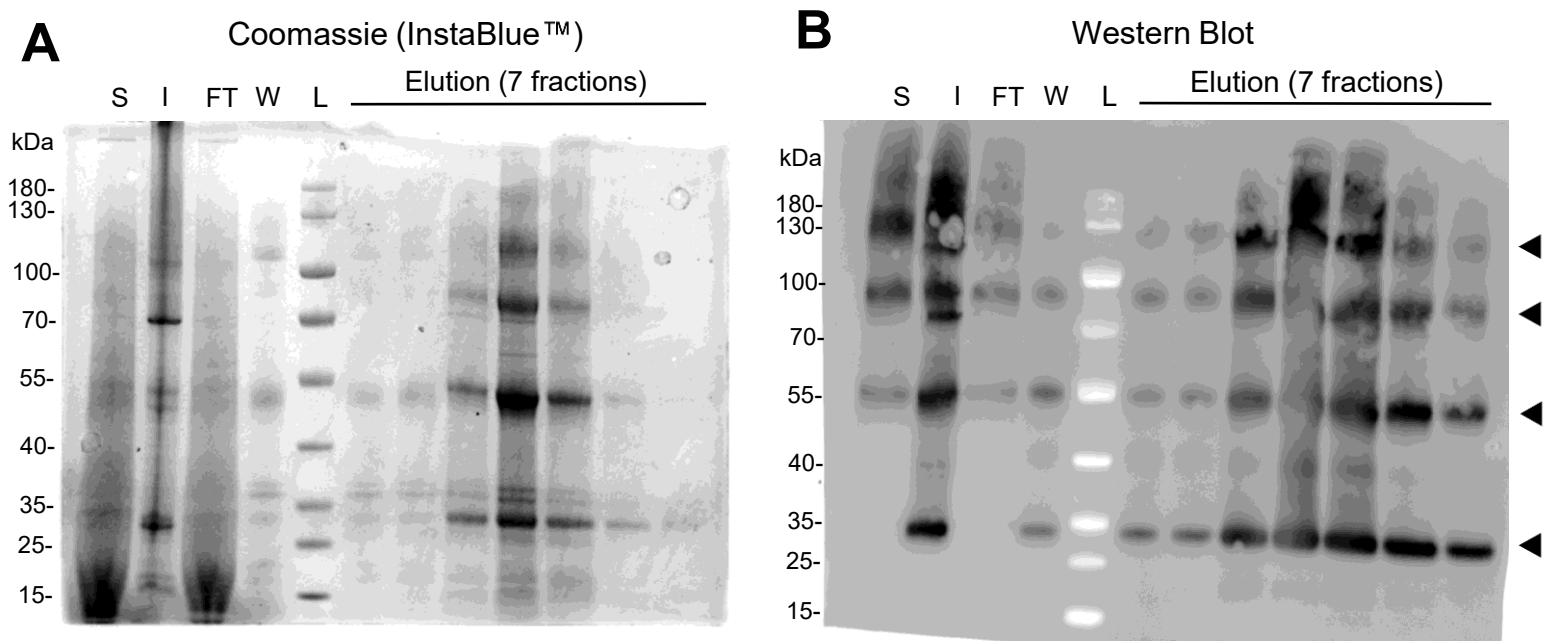


Figure 7. Soluble and insoluble fractions, and subsequent purification fractions of NavMs SMA2000 PLPs. (A) Coomassie stain. (B) Western Blot analyses are shown. Soluble (S), insoluble (I), flow through from IMAC (FT), 20 mM imidazole wash (W) and 7 sequential elution fractions with 500 mM imidazole are shown. NavMs monomers are can only be visualised in samples that have undergone IMAC purification.

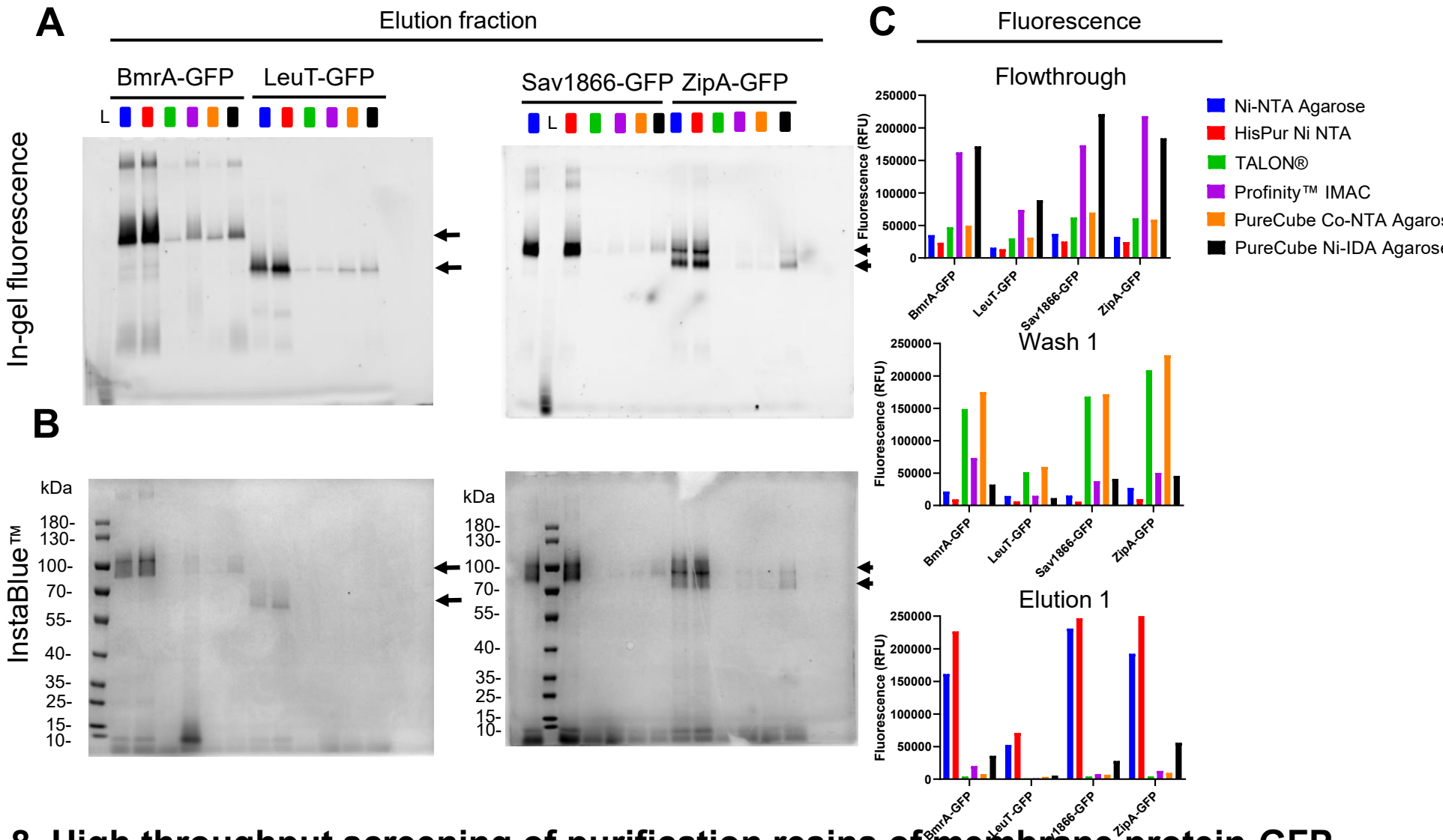


Figure 8. High throughput screening of purification resins of membrane protein-GFP PLPs. (A) In gel fluorescence. (B) Coomassie staining of samples following purification in a 96 well plate format using filter plates. Protein was eluted directly into black 96 well plates enabling the rapid analysis of purification yields using a plate reader to analyse the fluorescence of the GFP tag (C). Each step of the purification can be analysed to determine the location of the PLPs. Fluorescence was analysed at 485 nm excitation and 520 nm emission.

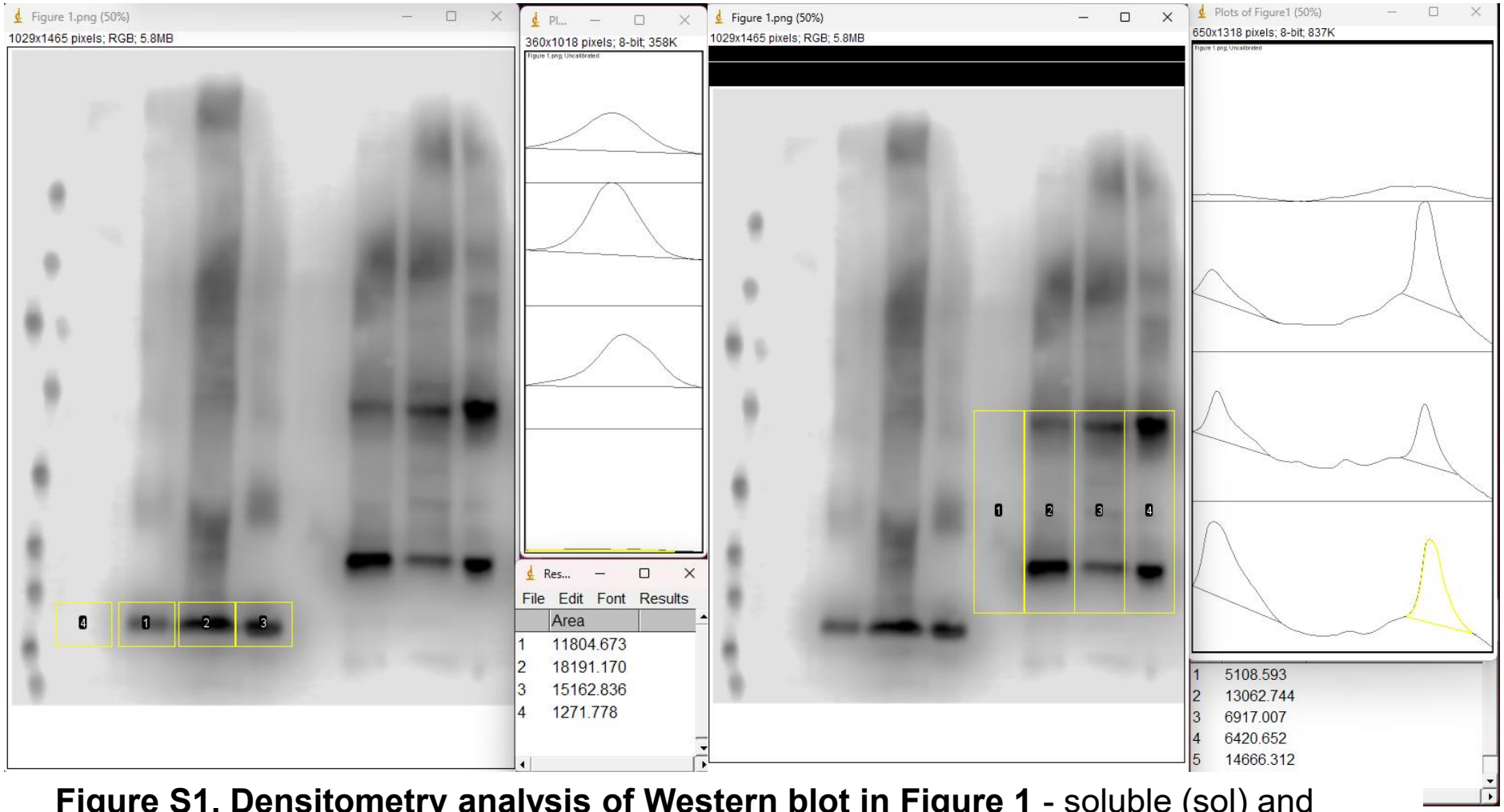


Figure S1. Densitometry analysis of Western blot in Figure 1 - soluble (sol) and insoluble (insol) fraction of AqpM and NavMs solubilised with SMA2000. Image analysis was carried out using ImageJ

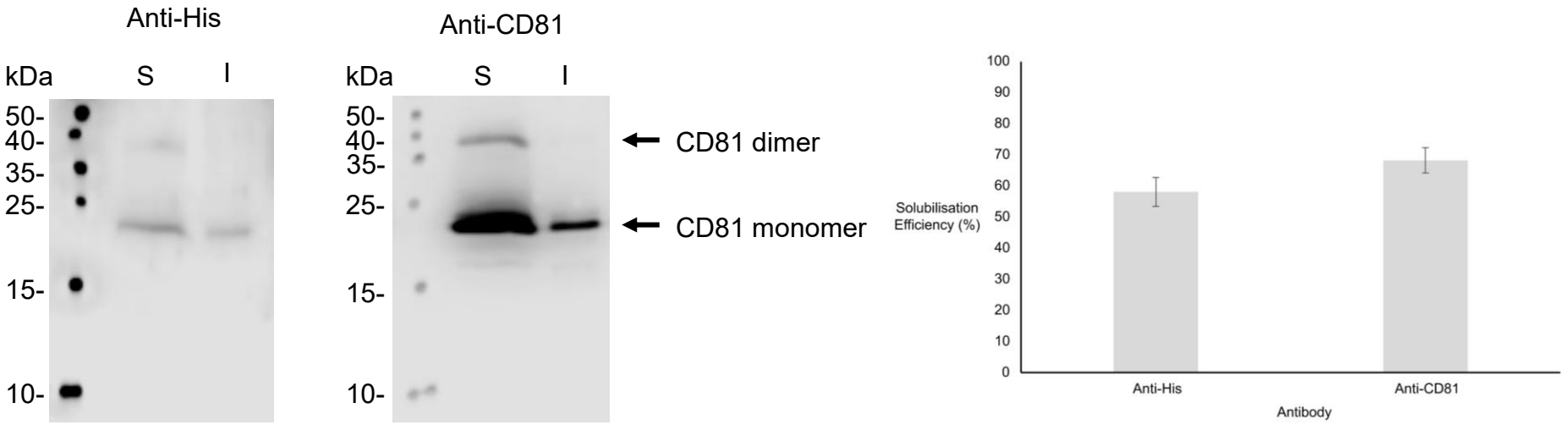


Figure S2. Soluble and insoluble fractions of CD81 solubilised with SMA2000 analysed by Western Blot. An anti-His antibody was used for detecting the poly Histidine purification tag, and is compared with a CD81 specific antibody.

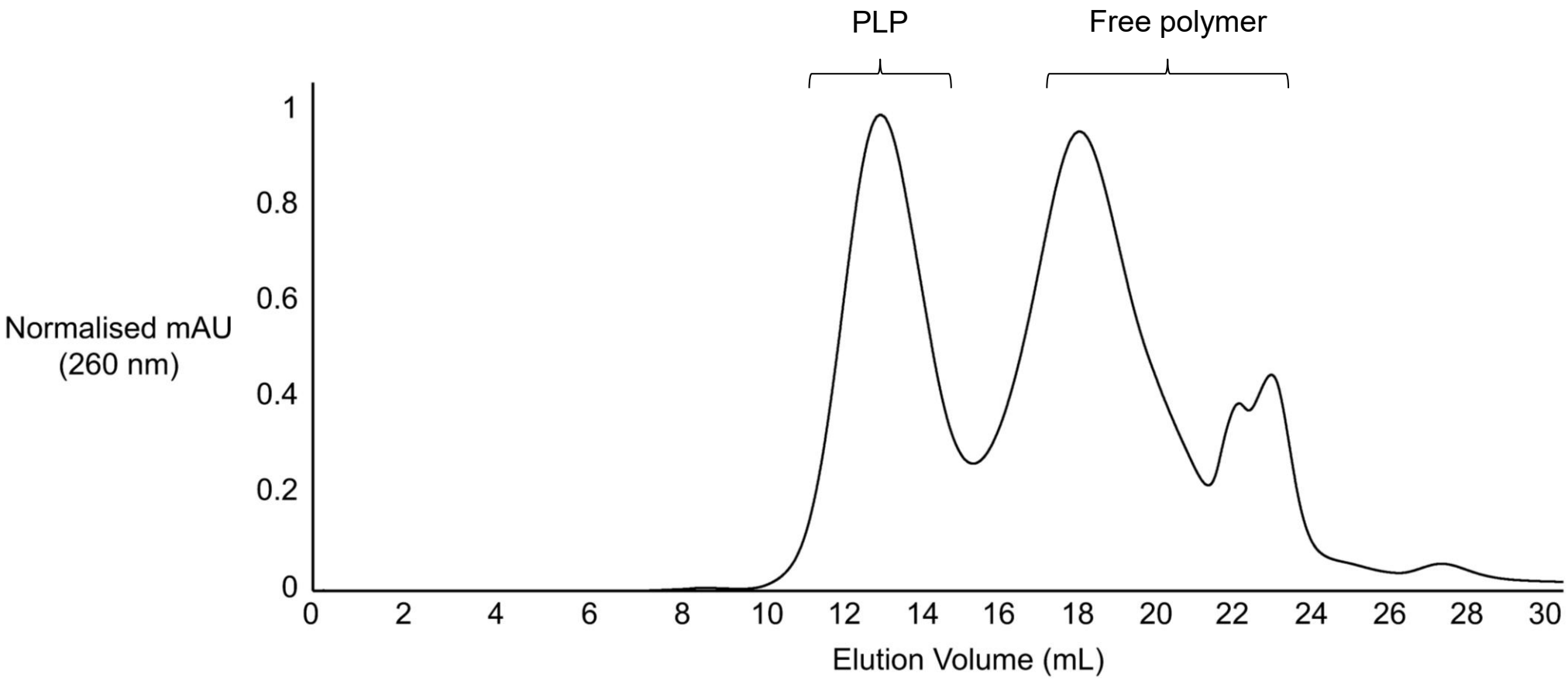


Figure S3. Size exclusion chromatogram of SMA2000 1,2-dimyristoyl-sn-glycero-3-phosphocholine (DMPC) discs. Size exclusion chromatography can be used to remove excess free polymer, primarily used for lipid-only polymer-lipid particles (PLPs) which cannot be purified by IMAC.

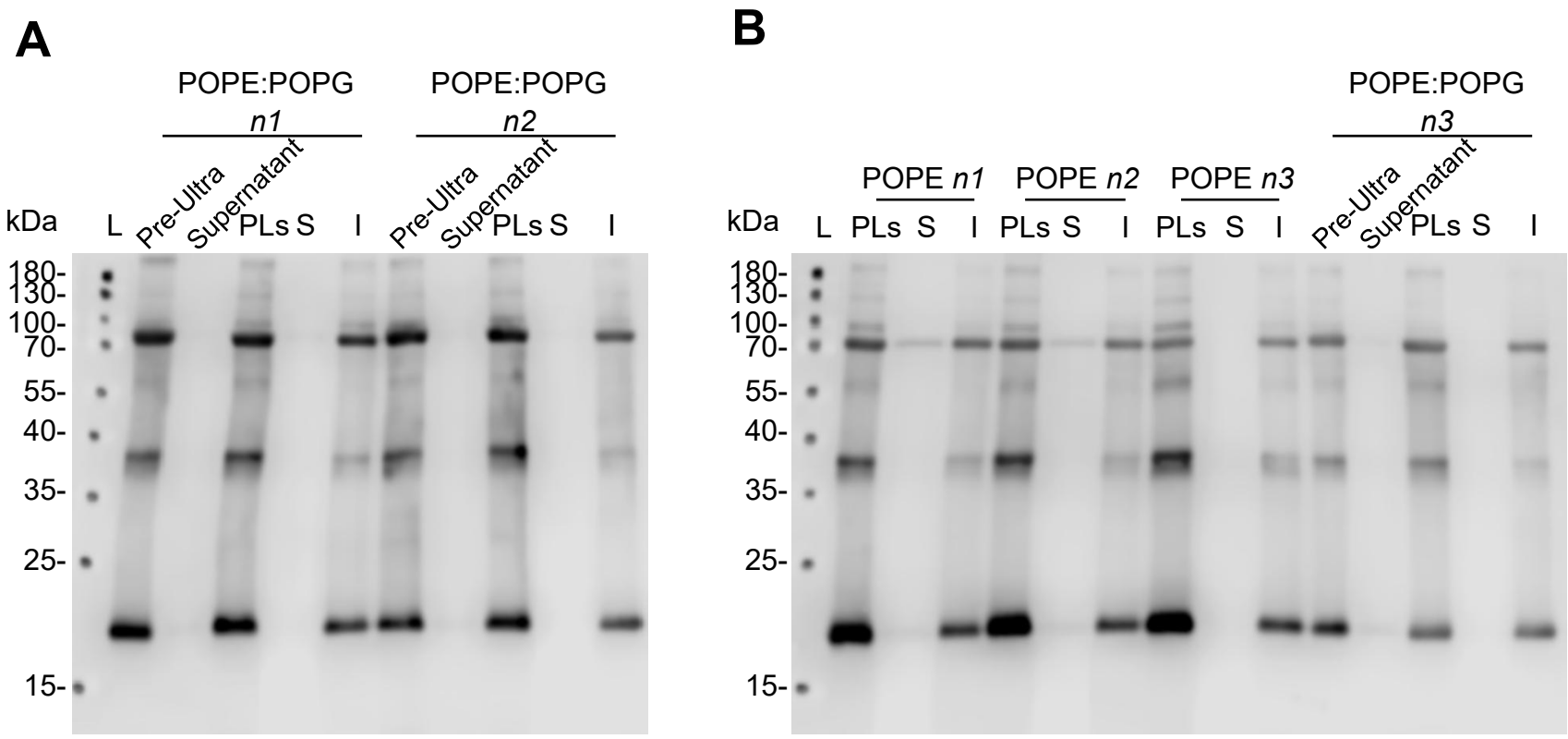


Figure S3. Western Blot Images of POPE:POPG AqpZ Proteoliposomes. Proteoliposomes were generated of AqpZ with POPE:POPG (75:25 w:w). (**A**) (**B**) Samples of proteoliposomes were taken before ultracentrifugation (Pre-Ultra), after ultracentrifugation to pellet proteoliposomes (PLs), as well as waste supernatant fraction; PLs were solubilised with SMA2000 2.5% w/v final and soluble (S) and insoluble (I) fractions were analysed on a 12.5% handcast SDS-PAGE gel and western blot with anti-His primary antibody (1:5000), and anti-mouse HRP-conjugated secondary antibody (1:5000). POPE-AqpZ proteoliposomes were generated and analysed in parallel in (**B**), however these are not relevant to this work.

Figure 1

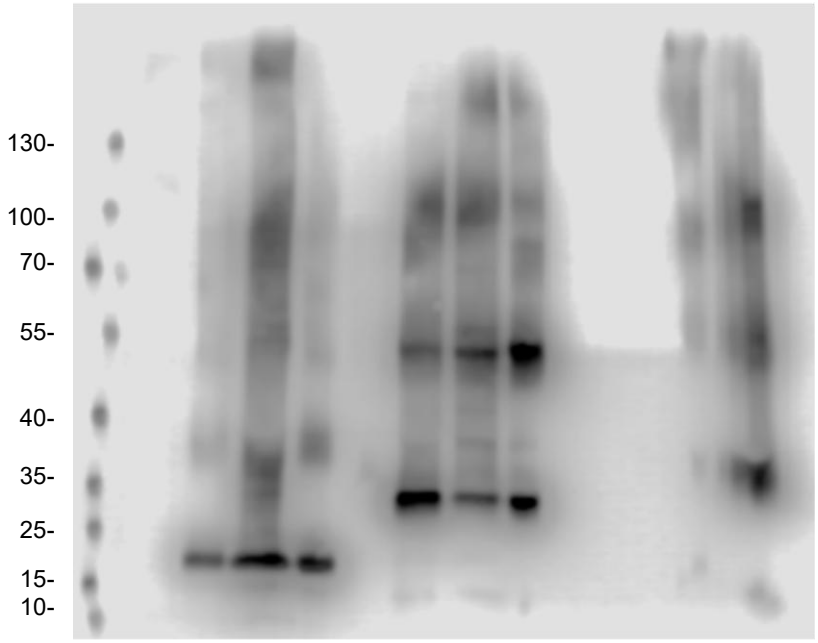


Figure 4

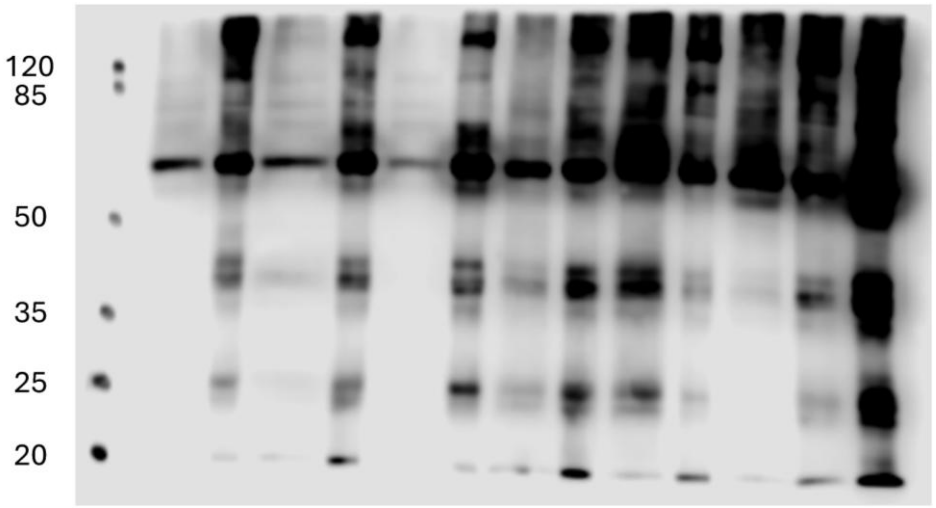
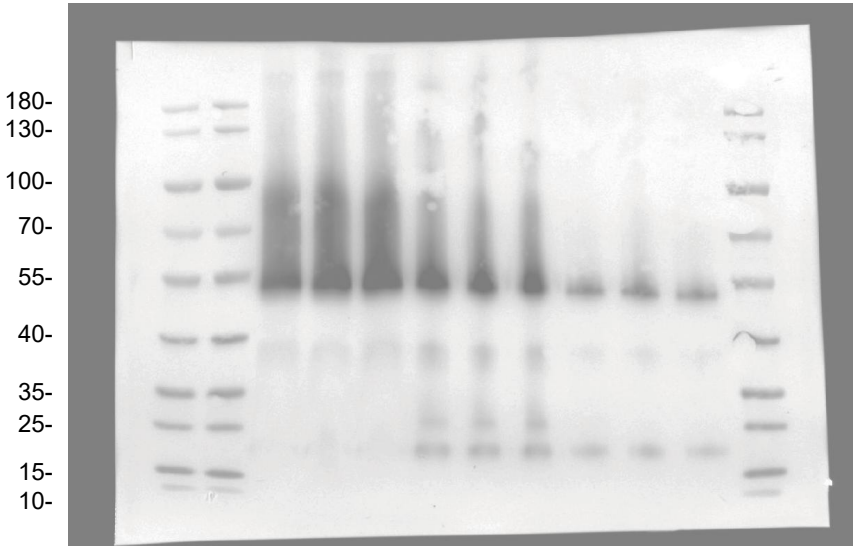
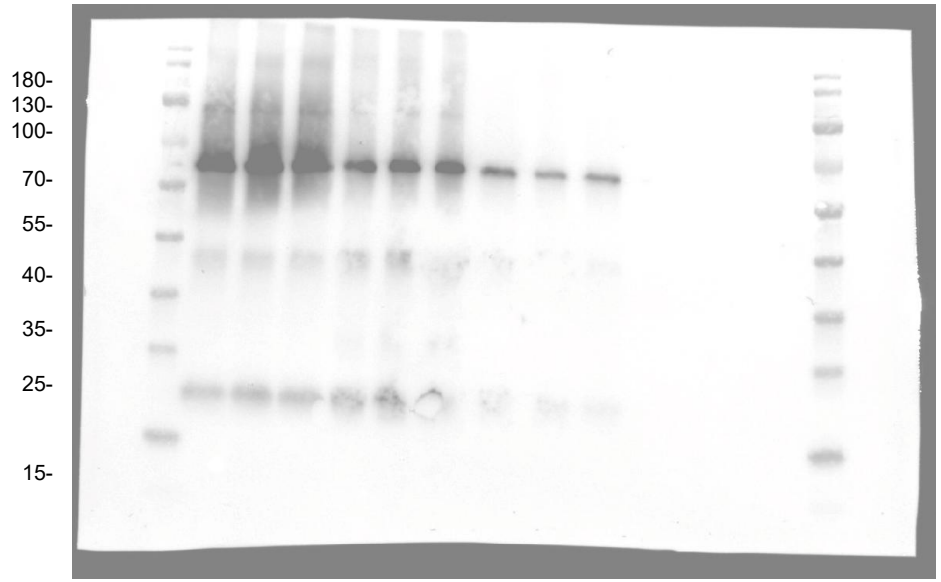
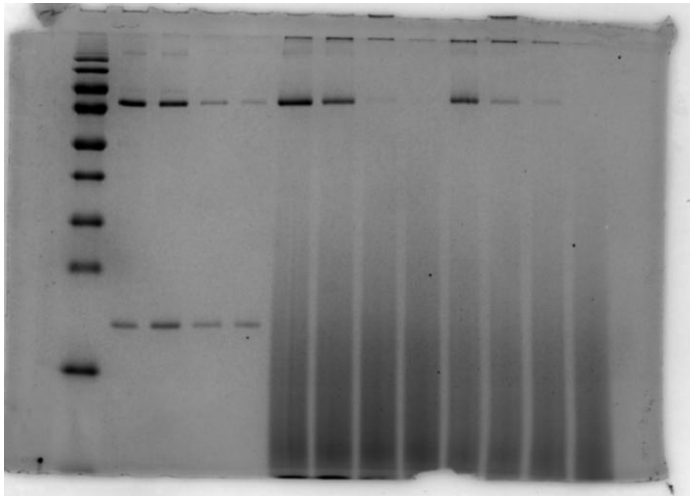


Figure 5


180-
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180-
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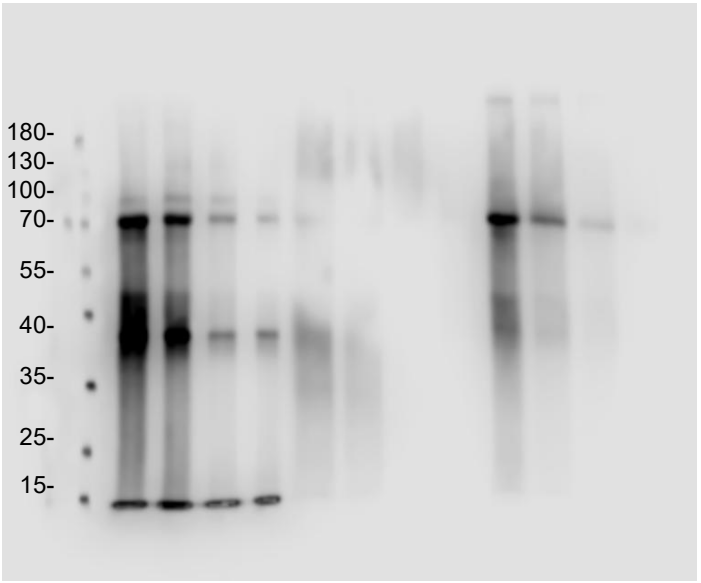
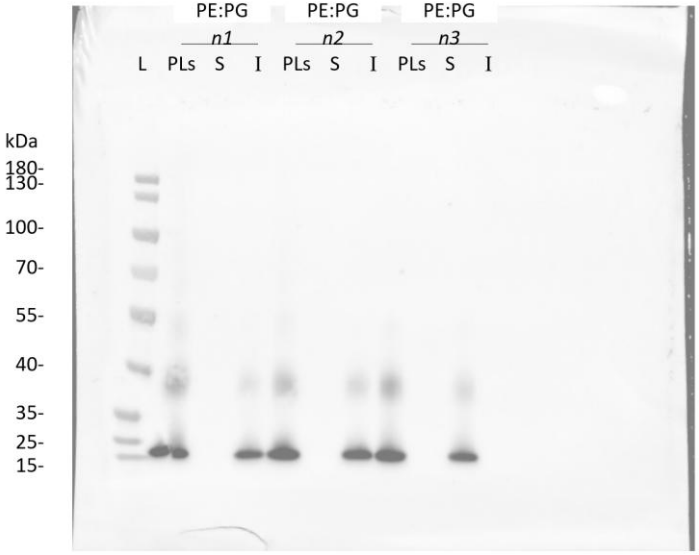
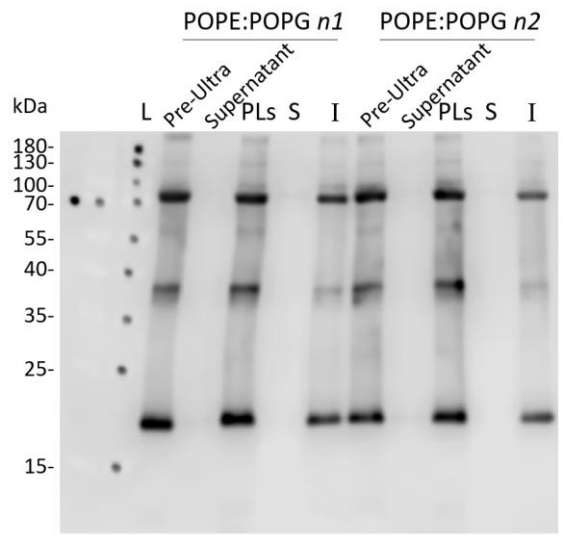
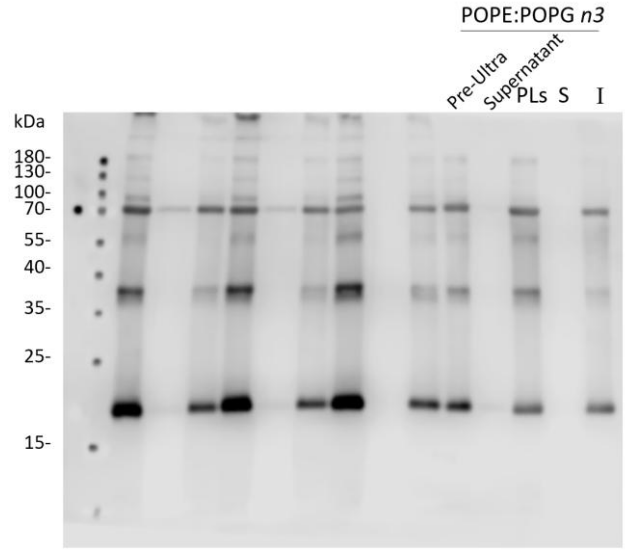
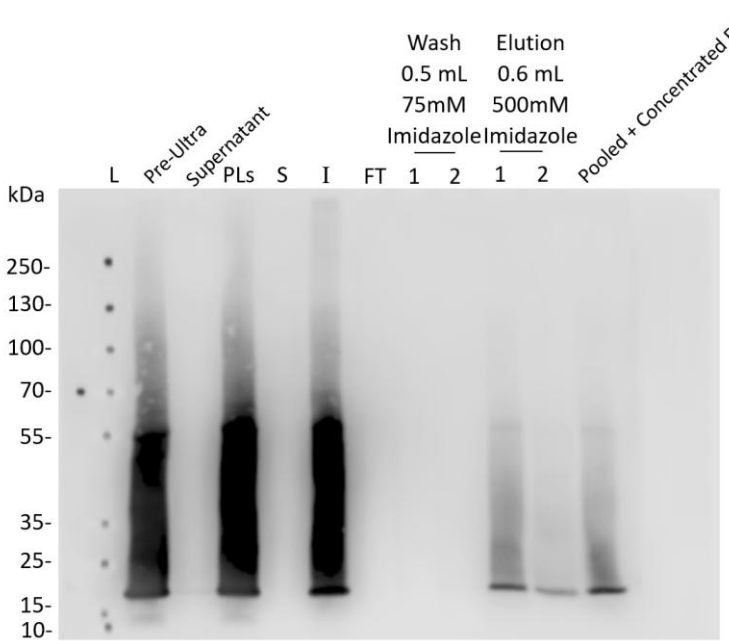

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Figure 6


PE:PG
n1
PE:PG
n2
PE:PG
n3
L PLs S I PLs S I PLs S I
kDa
180-
130-
100-
70-
55-
40-
35-
25-
15-


POPE:POPG n1
POPE:POPG n2
L
Pre-Ultra
Supernatant
PLs S I
Pre-Ultra
Supernatant
PLs S I
kDa
180-
130-
100-
70-
55-
40-
35-
25-
15-


POPE:POPG n3
Pre-Ultra
Supernatant
PLs S I
kDa
180-
130-
100-
70-
55-
40-
35-
25-
15-


Wash
0.5 mL
75mM
Imidazole
Elution
0.6 mL
500mM
Imidazole
Pooled + Concentrated E1 E2
L
Pre-Ultra
Supernatant
PLs S I FT 1 2 1 2
kDa
250-
130-
100-
70-
55-
35-
25-
15-
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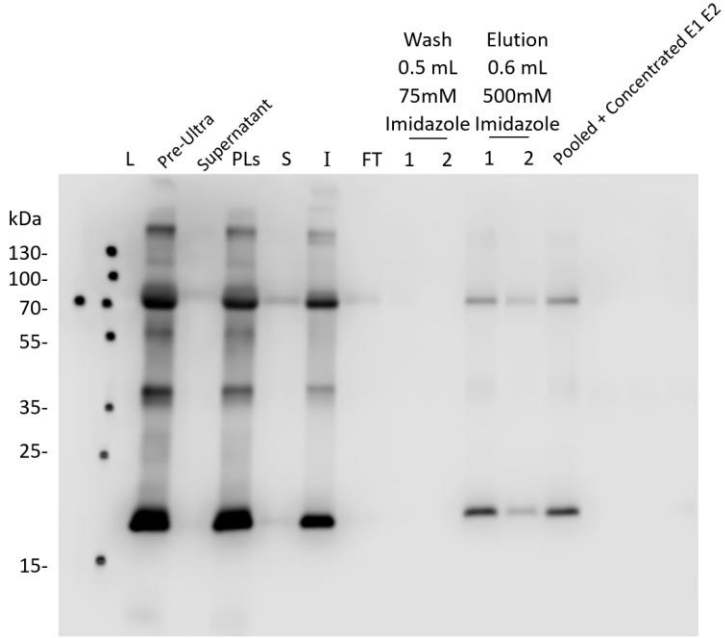

Wash
0.5 mL
75mM
Imidazole
Elution
0.6 mL
500mM
Imidazole
Pooled + Concentrated E1 E2
L
Pre-Ultra
Supernatant
PLs S I FT 1 2 1 2
kDa
130-
100-
70-
55-
35-
25-
15-

Figure 7

