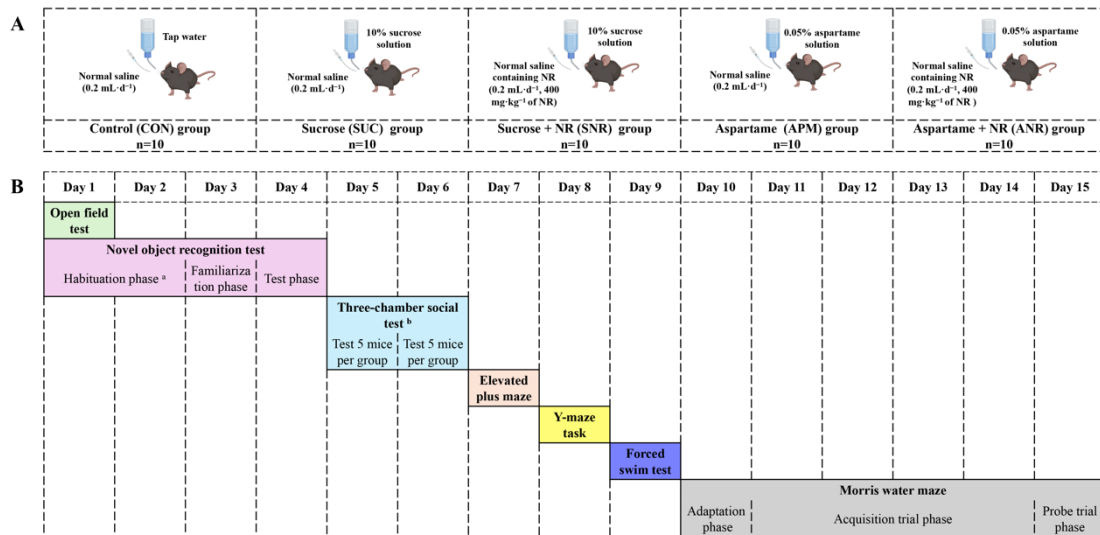
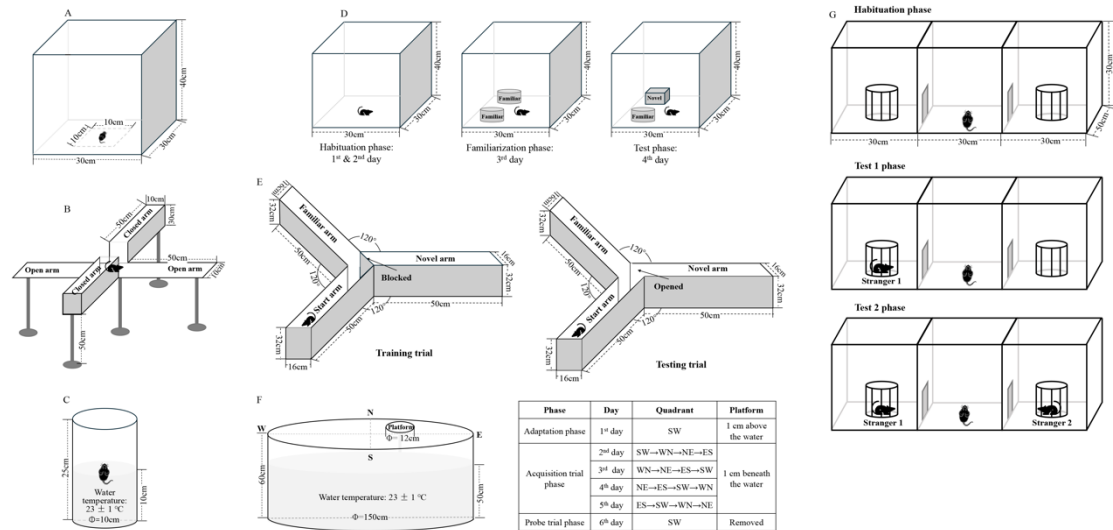


**Supplemental Figure 1.** (A) The chemical structure of NR. (B) The process of NR boosting NAD<sup>+</sup> biosynthesis in cells. Nicotinamide adenine dinucleotide (NAD<sup>+</sup>); nicotinamide riboside (NR); nicotinamide mononucleotide (NMN); nicotinamide (NAM); nucleoside phosphorylase (NP); nicotinamide phosphoribosyltransferase (NAMPT); nicotinamide ribose kinases (NRK); NMN/NaMN adenylyltransferases (NMNAT).



**Supplemental Figure 2.** (A) The specific exposure process of sweeteners and intervention strategy of NR in mice. (B) The specific time schedule of behavioural tests. <sup>a</sup> Since the open field test and the novel object recognition test were conducted in the same open bin, the open field test in Day 1 was also considered as the first day test for the habituation phase of the novel object recognition test. <sup>b</sup> Due to the long duration of each mice of the three-chamber social test, the whole test was conducted over two days, with 5 mice in each group tested on each day.



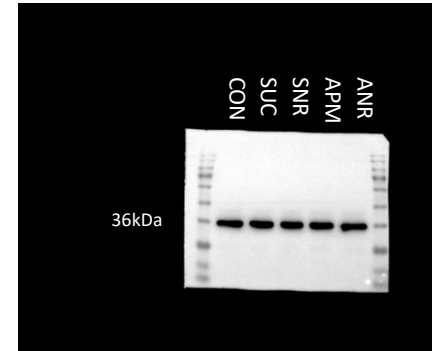
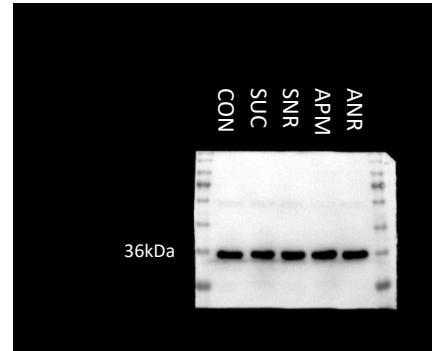
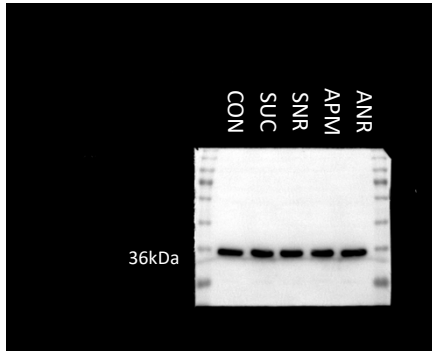
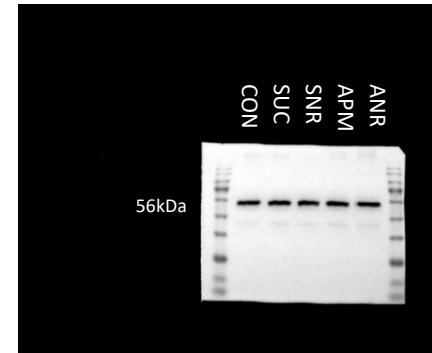
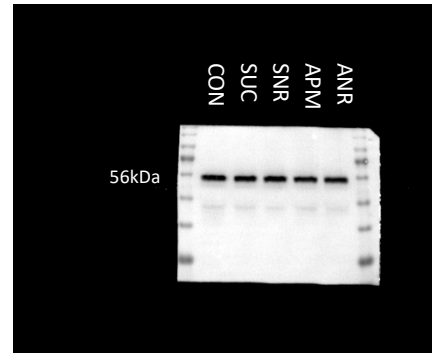
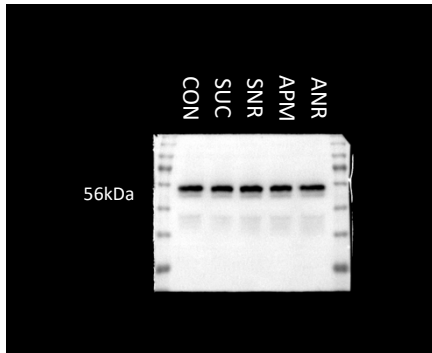
**Supplemental Figure 3. Schematic diagram of behavioral tests equipment and process.** (A) Open field test. (B) Elevated plus maze. (C) Forced swim test. (D) Novel object recognition test. (E) Y-maze task. (F) Morris water maze. (G) Three-chamber social test.

**Supplemental Table 1. Primers for real-time PCR**

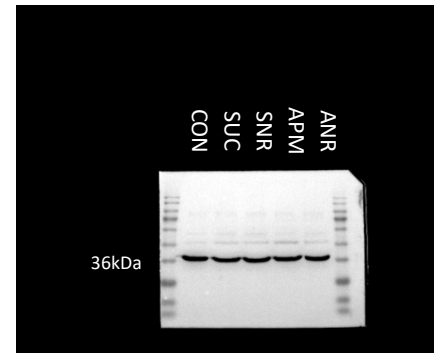
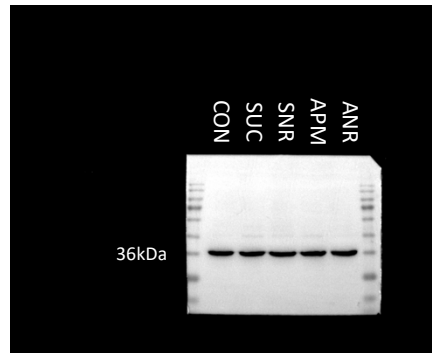
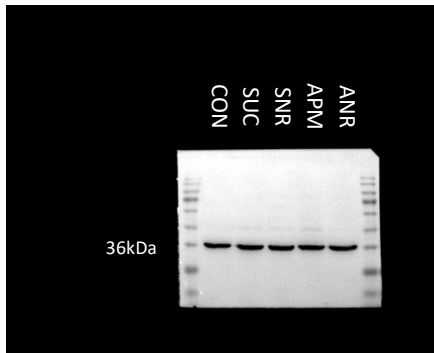
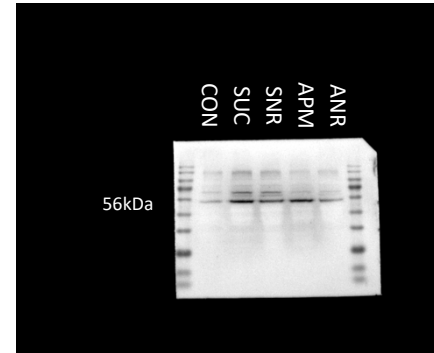
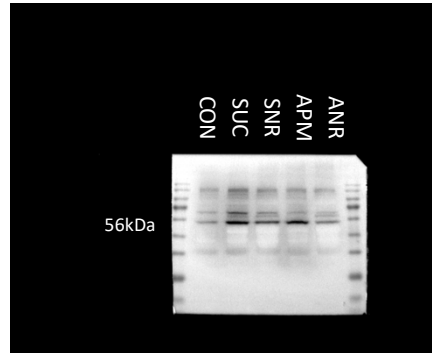
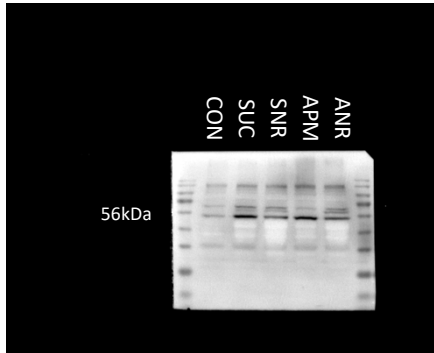
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Reverse	TGCCCACTCTCCCCACAT
<b>Beclin1</b>	
Forward	CTGGGGACCTTTTTGACATC
Reverse	TTGCGGTTCTTTCCACGTC
<b>LC3</b>	
Forward	CCACACCCATCGCTGACA
Reverse	AAAGAGCAACCCGAACAT
<b>GAPDH</b>	
Forward	TGTTTCCTCGTCCCGTAG
Reverse	CAATCTCCACTTTGCCACT
<b>Caspase-3</b>	
Forward	ACTGGAAAGCCGAAACTC
Reverse	GTCCCACTGTCTGTCTCAAT
<b>BCL-2</b>	
Forward	CRACTTCTTCAGCATCAGGA
Reverse	TGAGCCACAGGGAGGTTCT
<b>Bax</b>	
Forward	CGCGTGGTTGCCCTTCTTA
Reverse	TTCCCAGCCACCCTGGTCTT

Brain

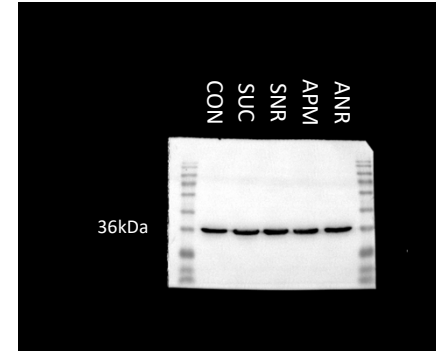
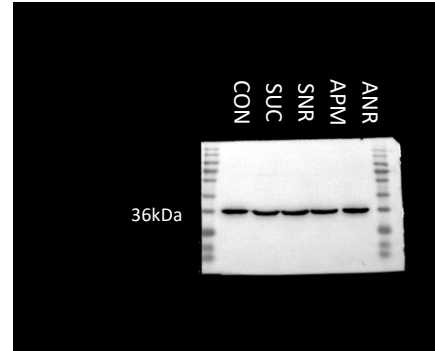
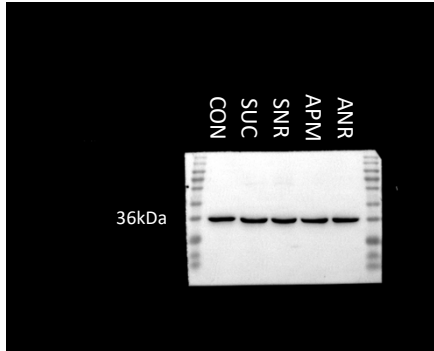
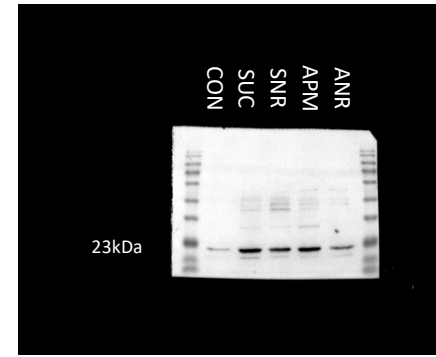
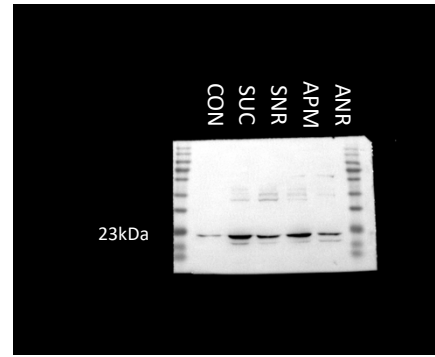
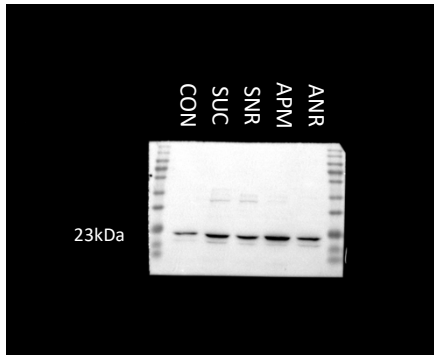
Akt (1)	Akt (2)	Akt (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



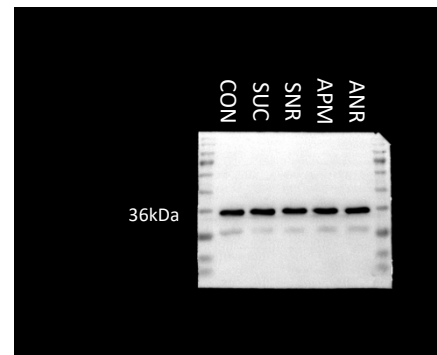
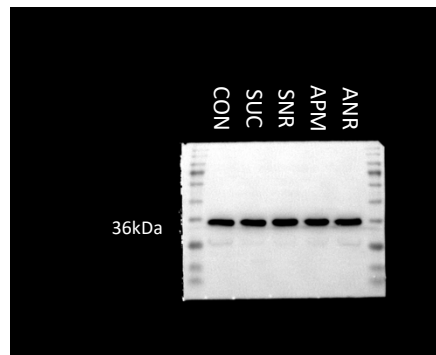
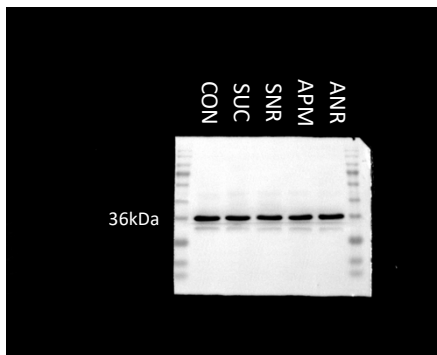
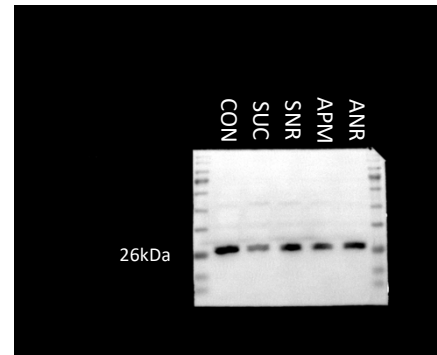
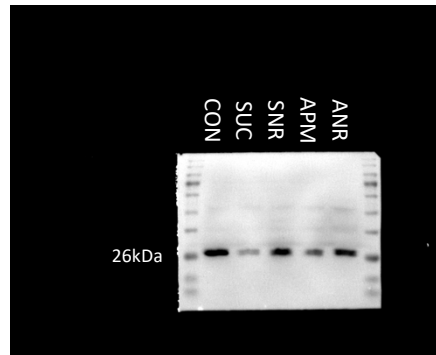
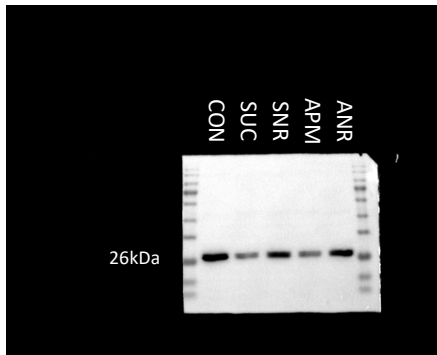
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GAPDH (1)	GAPDH (2)	GAPDH (3)



BAX (1)	BAX (2)	BAX (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)

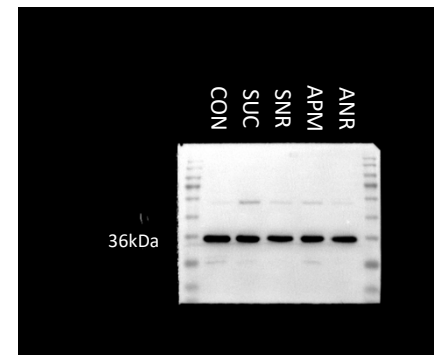
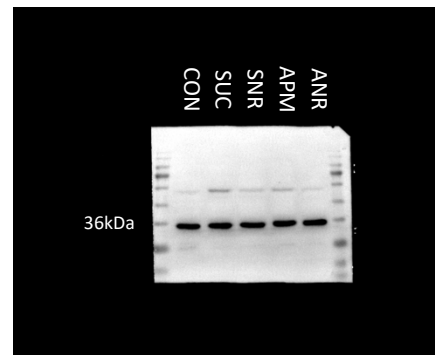
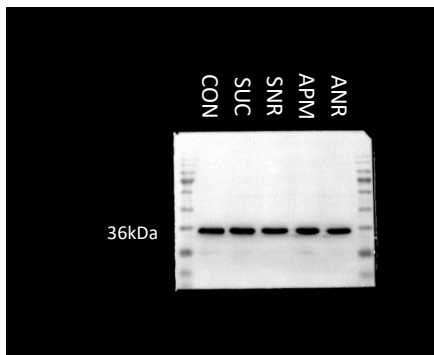
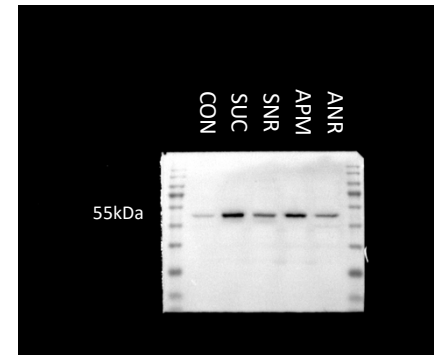
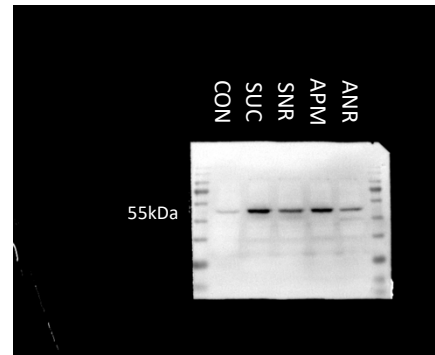
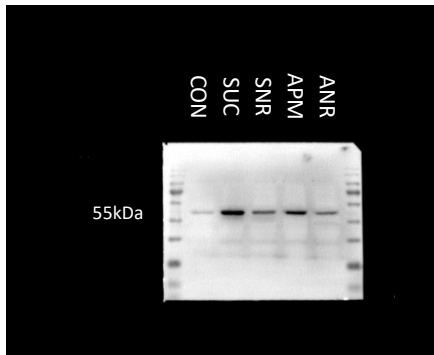


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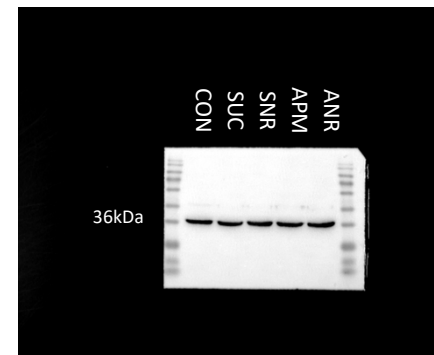
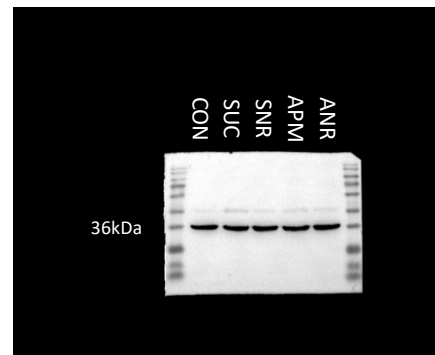
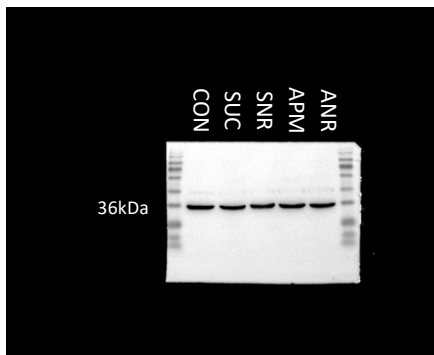
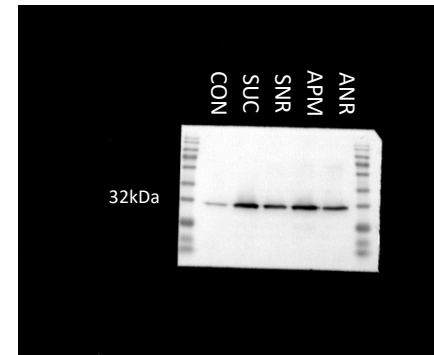
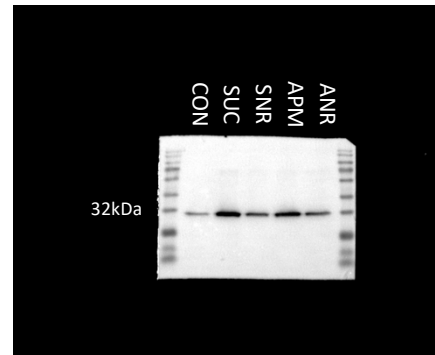
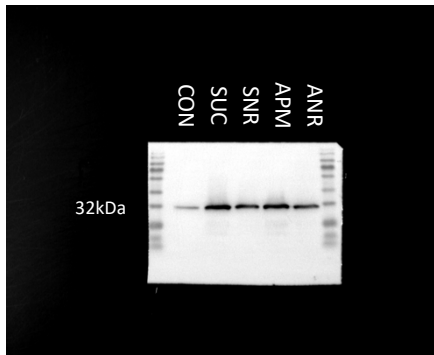




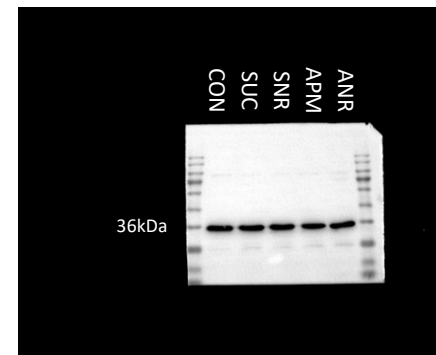
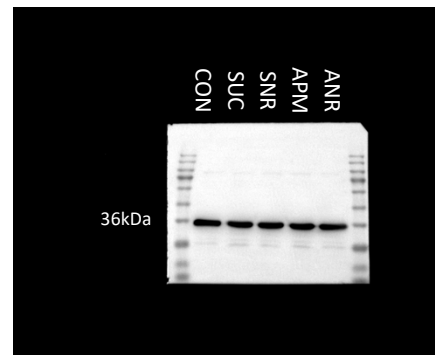
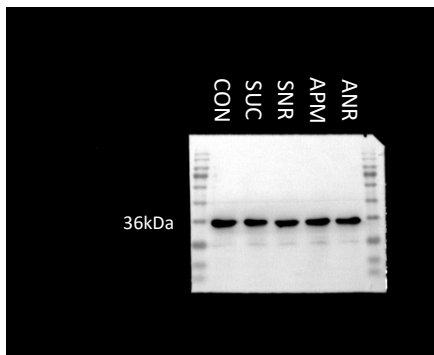
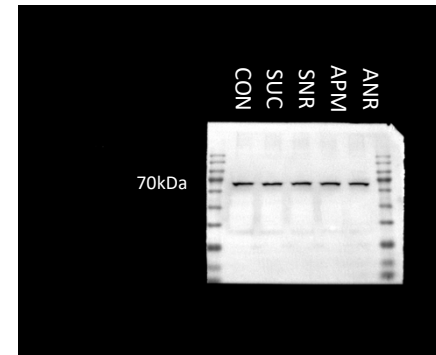
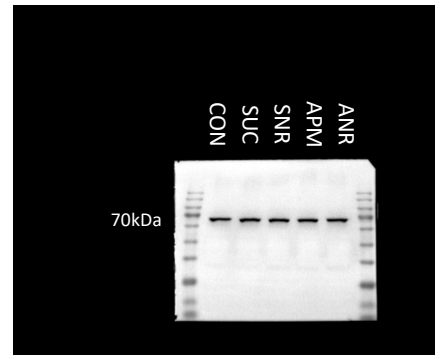
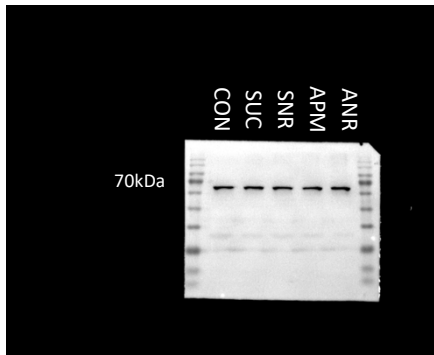
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GAPDH (1)	GAPDH (2)	GAPDH (3)



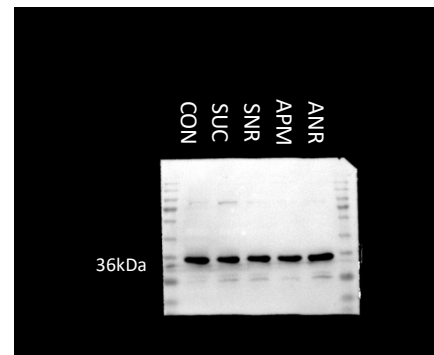
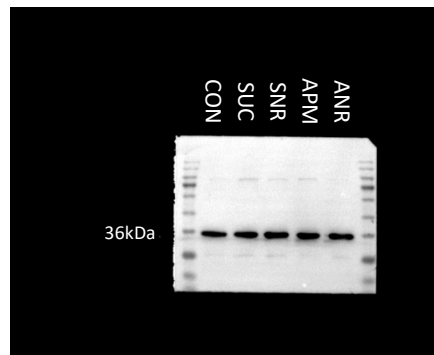
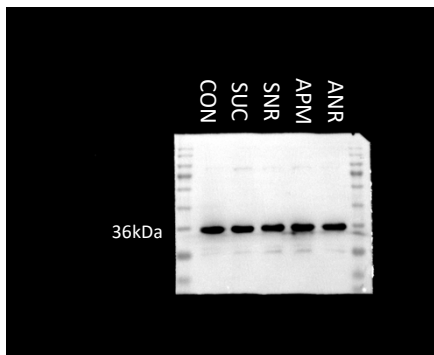
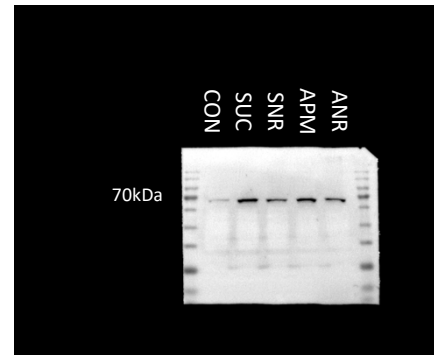
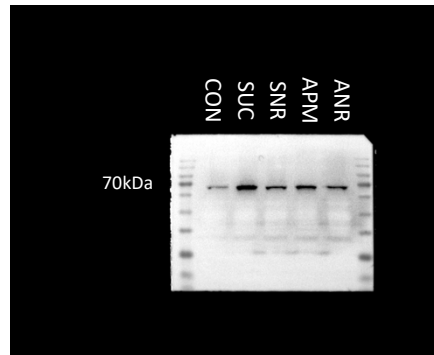
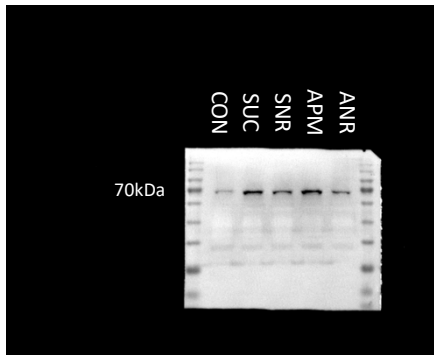
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GAPDH (1)	GAPDH (2)	GAPDH (3)



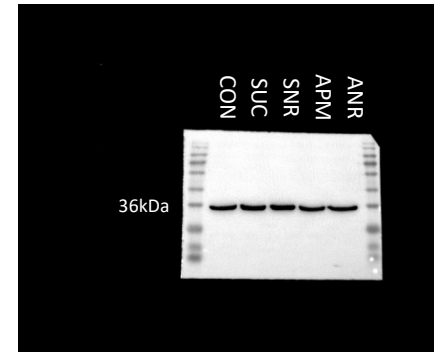
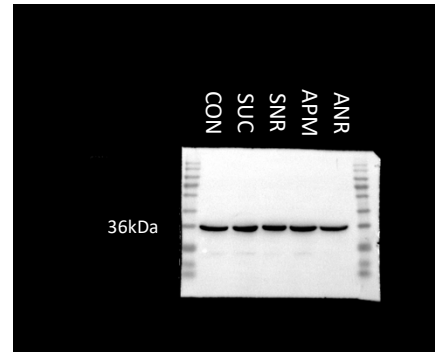
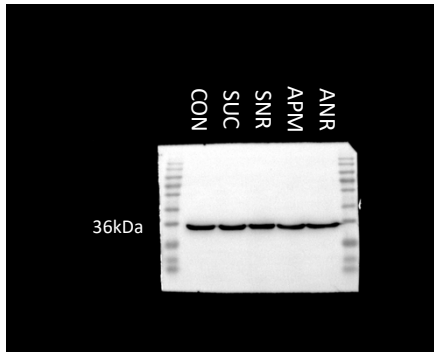
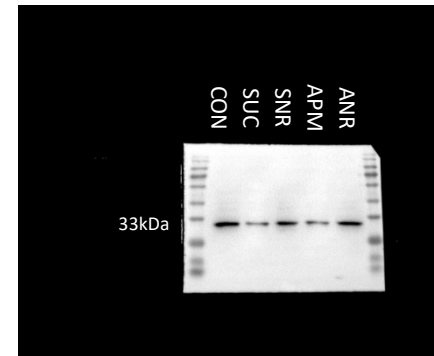
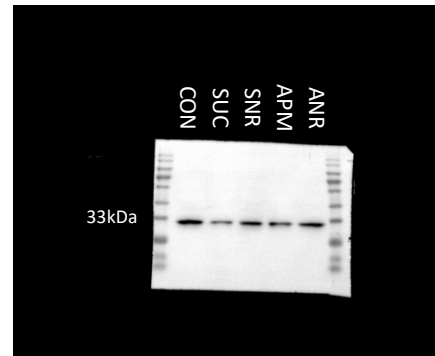
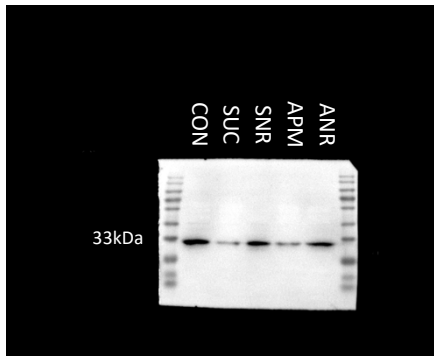
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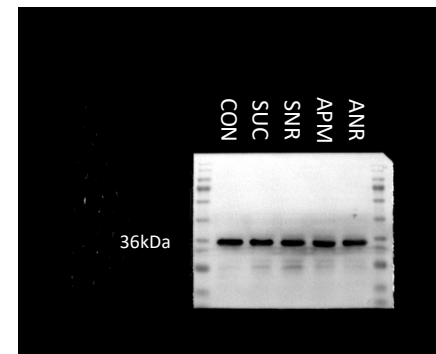
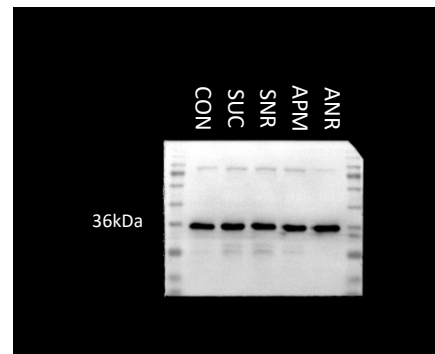
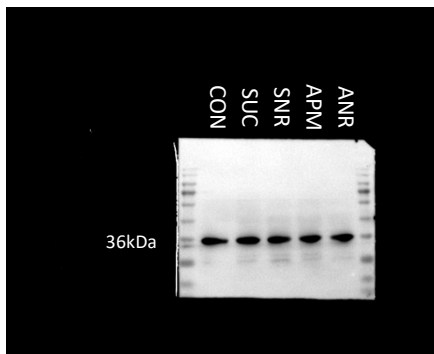
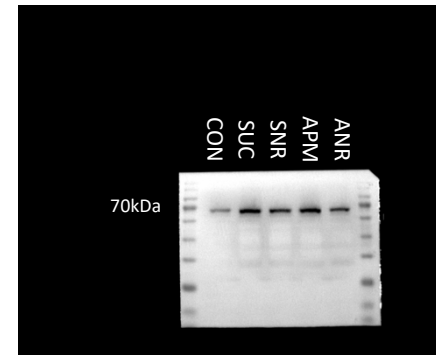
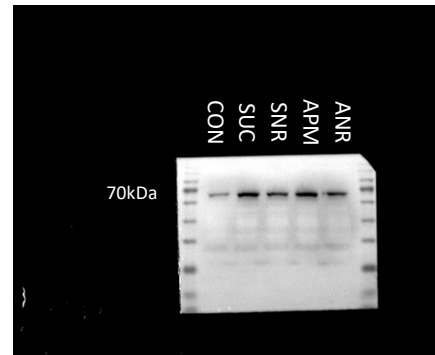
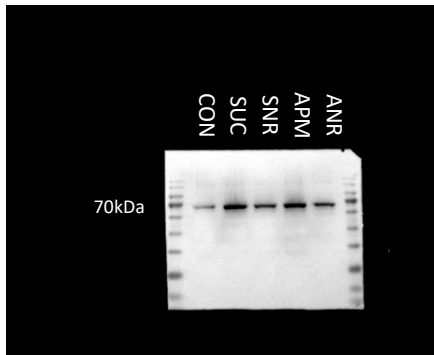
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GAPDH (1)	GAPDH (2)	GAPDH (3)



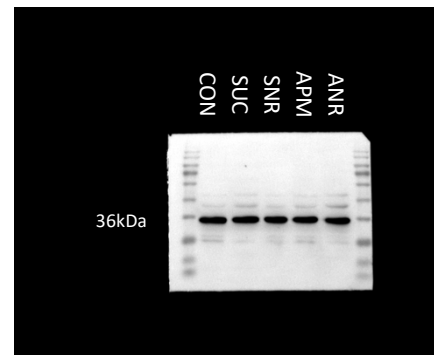
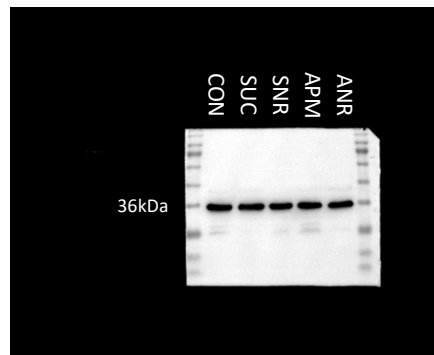
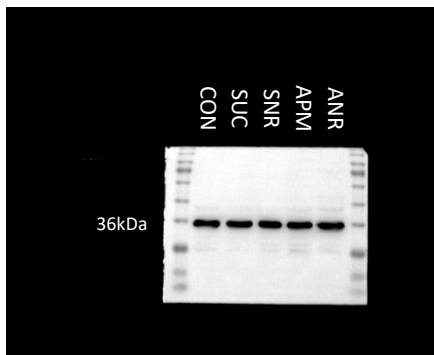
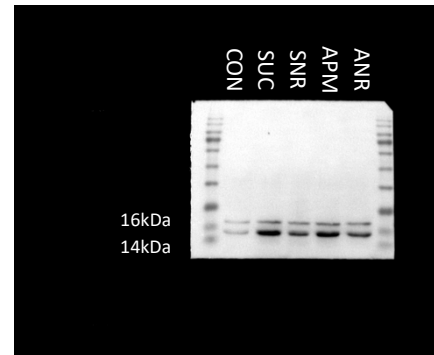
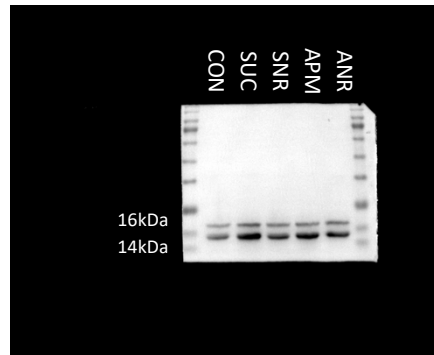
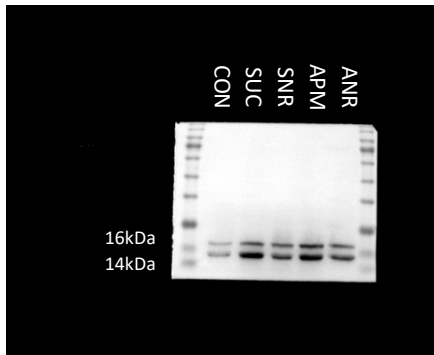
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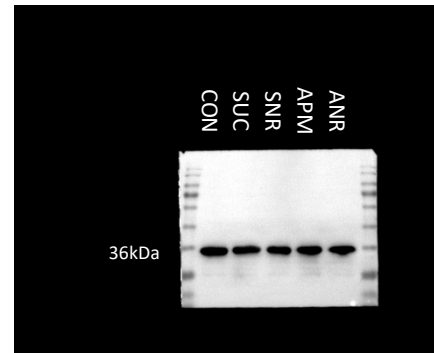
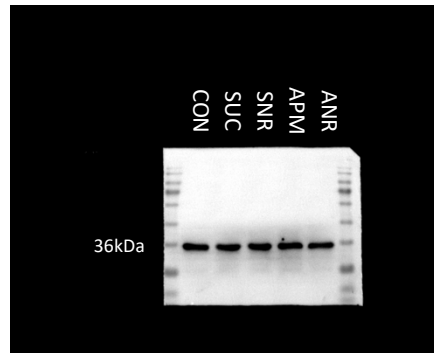
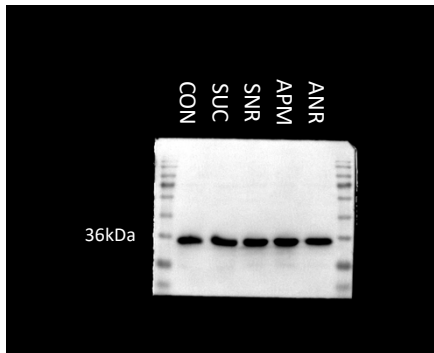
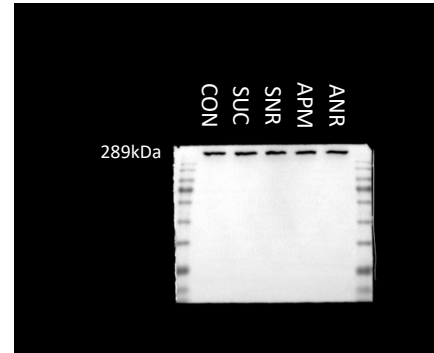
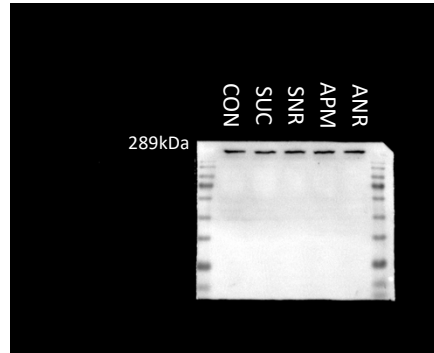
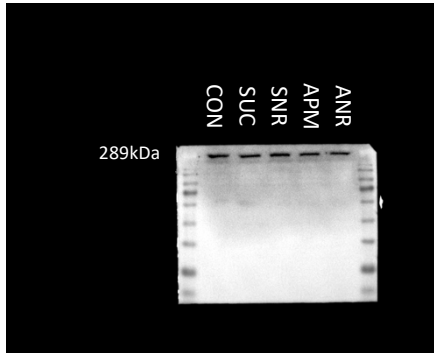
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GAPDH (1)	GAPDH (2)	GAPDH (3)



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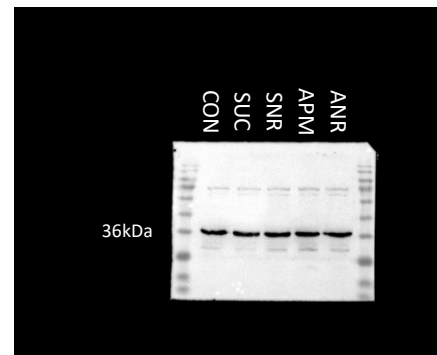
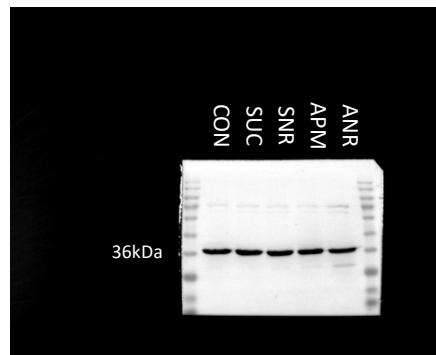
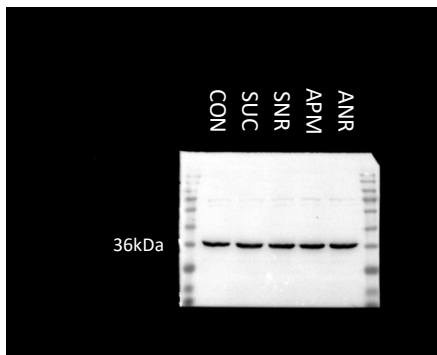
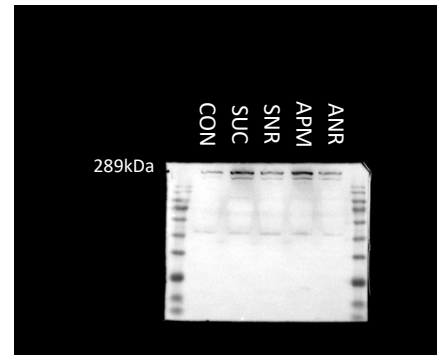
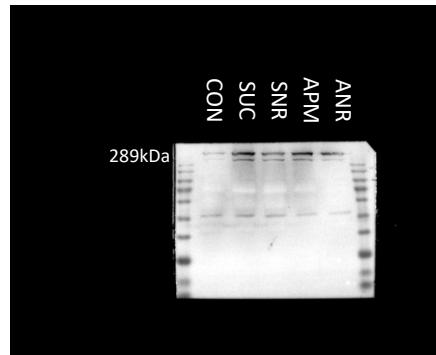
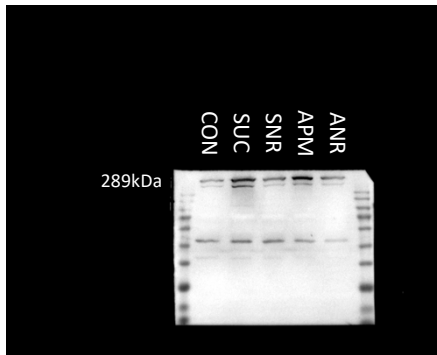


mTOR (1)	mTOR (2)	mTOR (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)

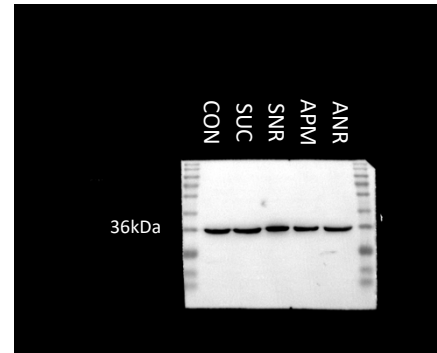
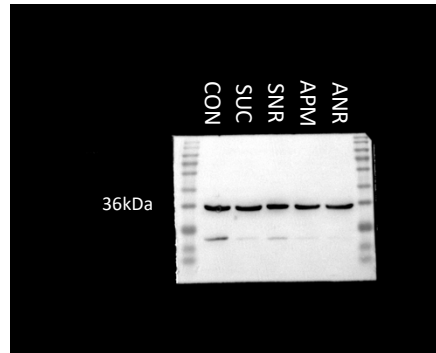
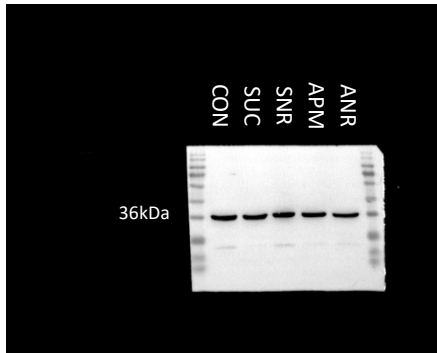
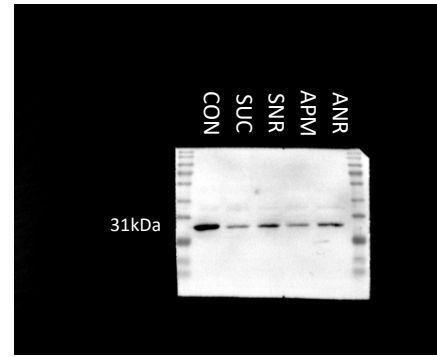
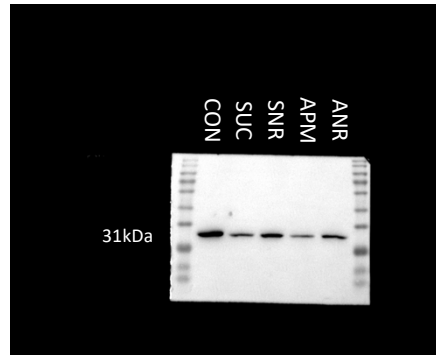
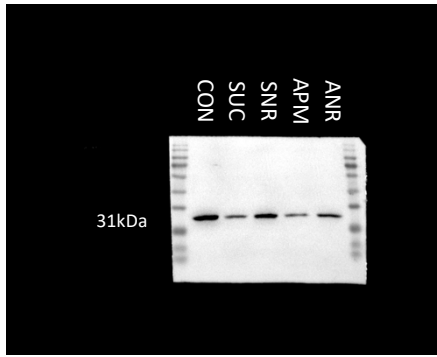




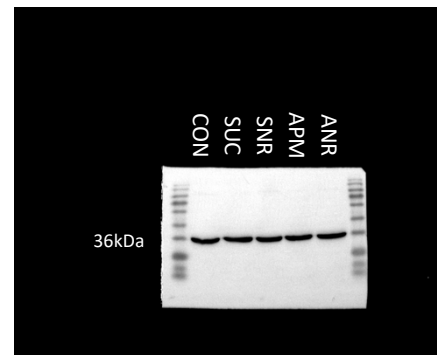
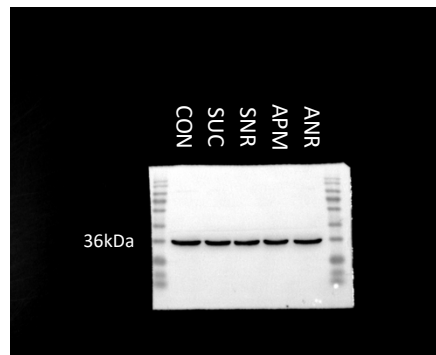
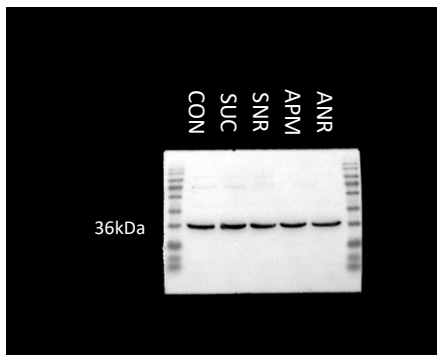
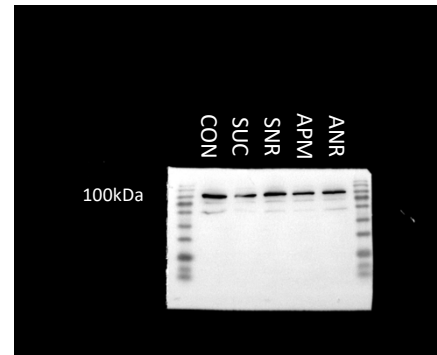
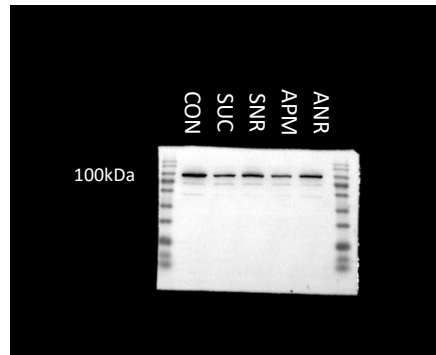
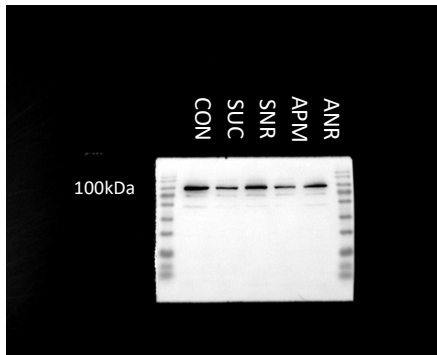
p-mTOR (1)	p-mTOR (2)	p-mTOR (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



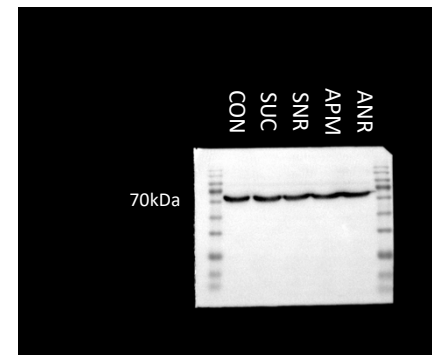
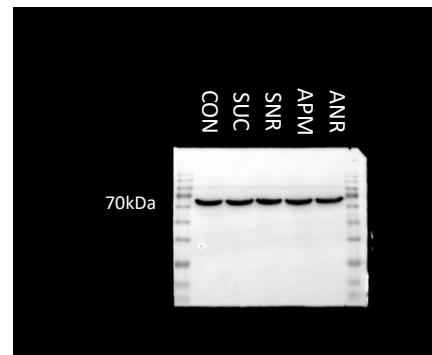
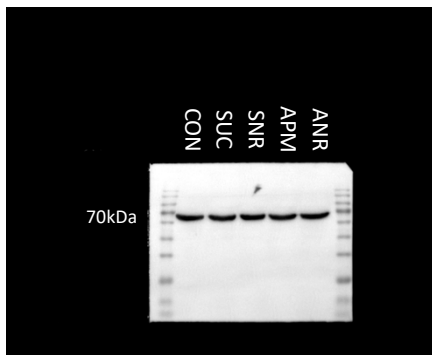
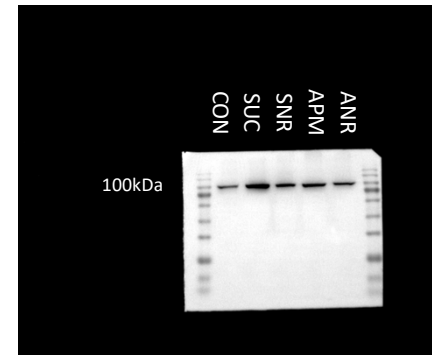
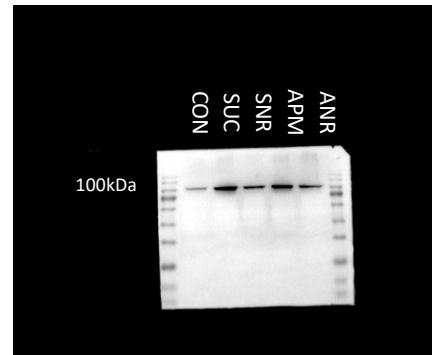
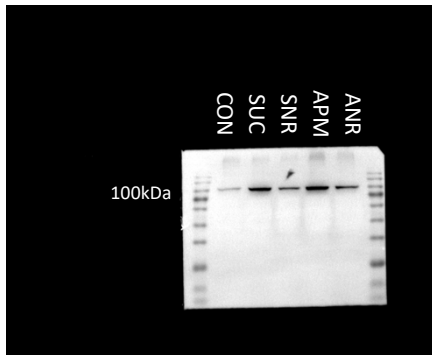
NQO-1 (1)	NQO-1 (2)	NQO-1 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



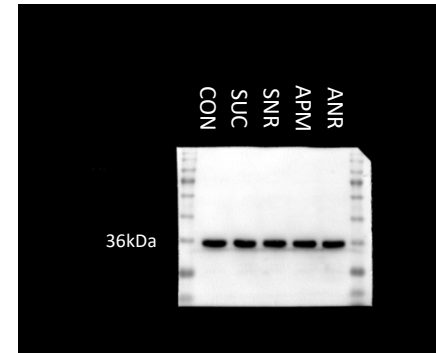
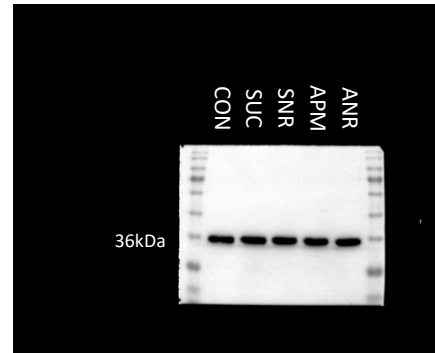
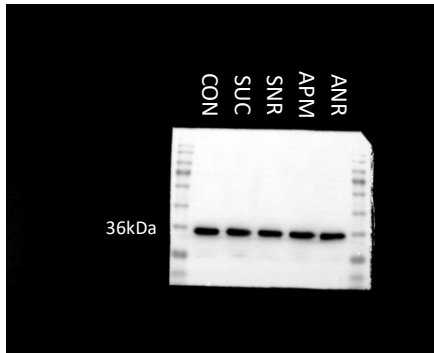
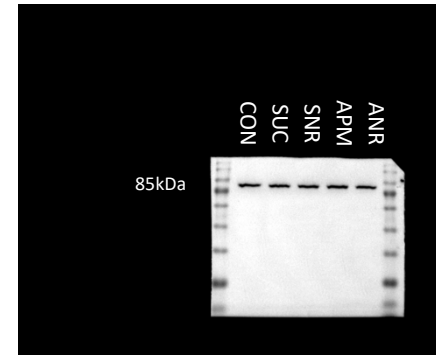
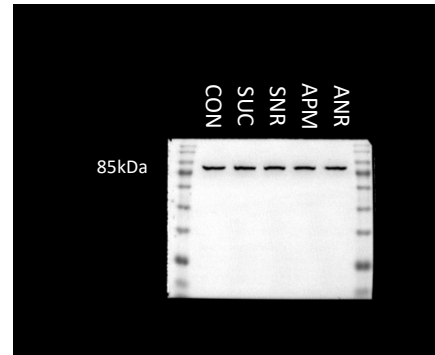
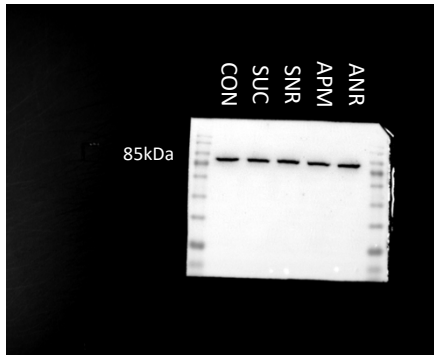
T-Nrf2 (1)	T-Nrf2 (2)	T-Nrf2 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



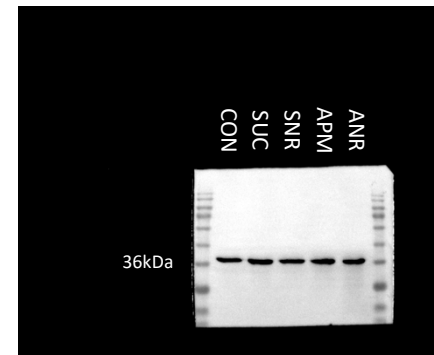
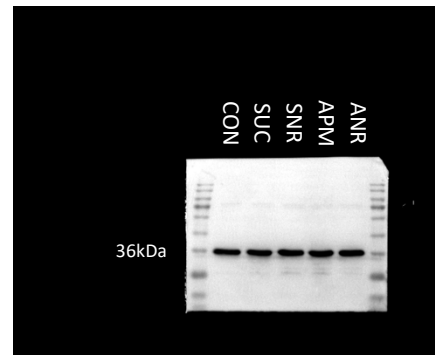
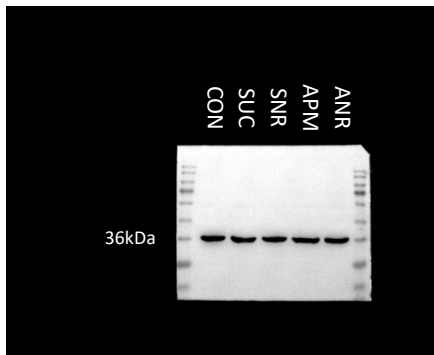
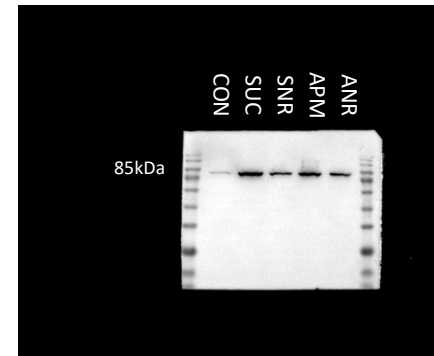
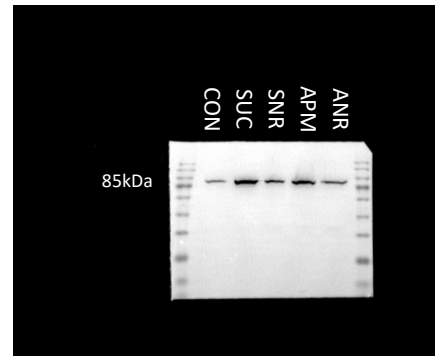
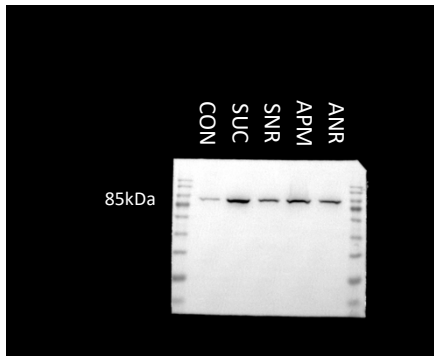
N-Nrf2 (1)	N-Nrf2 (2)	N-Nrf2 (3)
Lamin B1 (1)	Lamin B1 (2)	Lamin B1 (3)



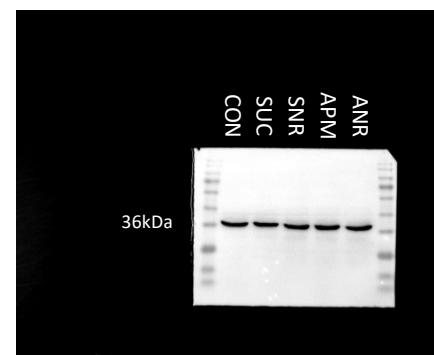
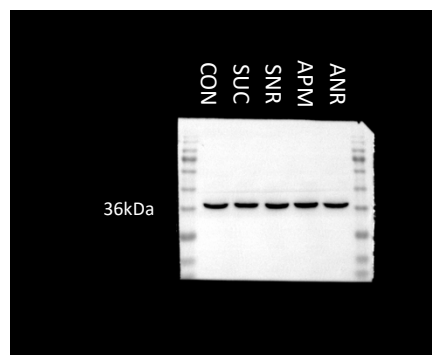
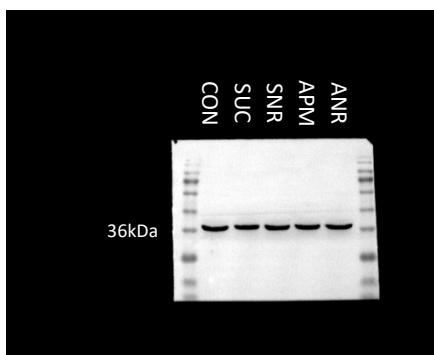
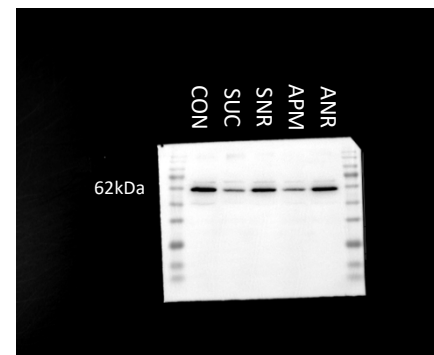
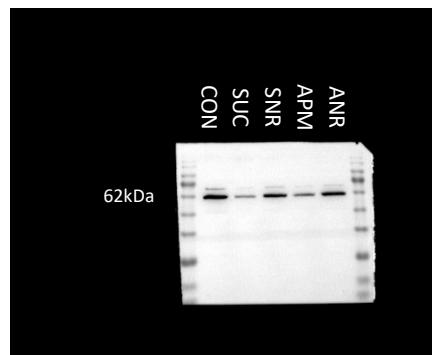
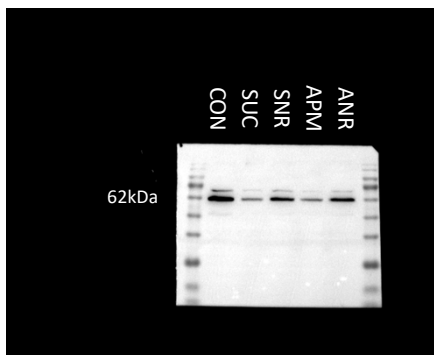
PI3K (1)	PI3K (2)	PI3K (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



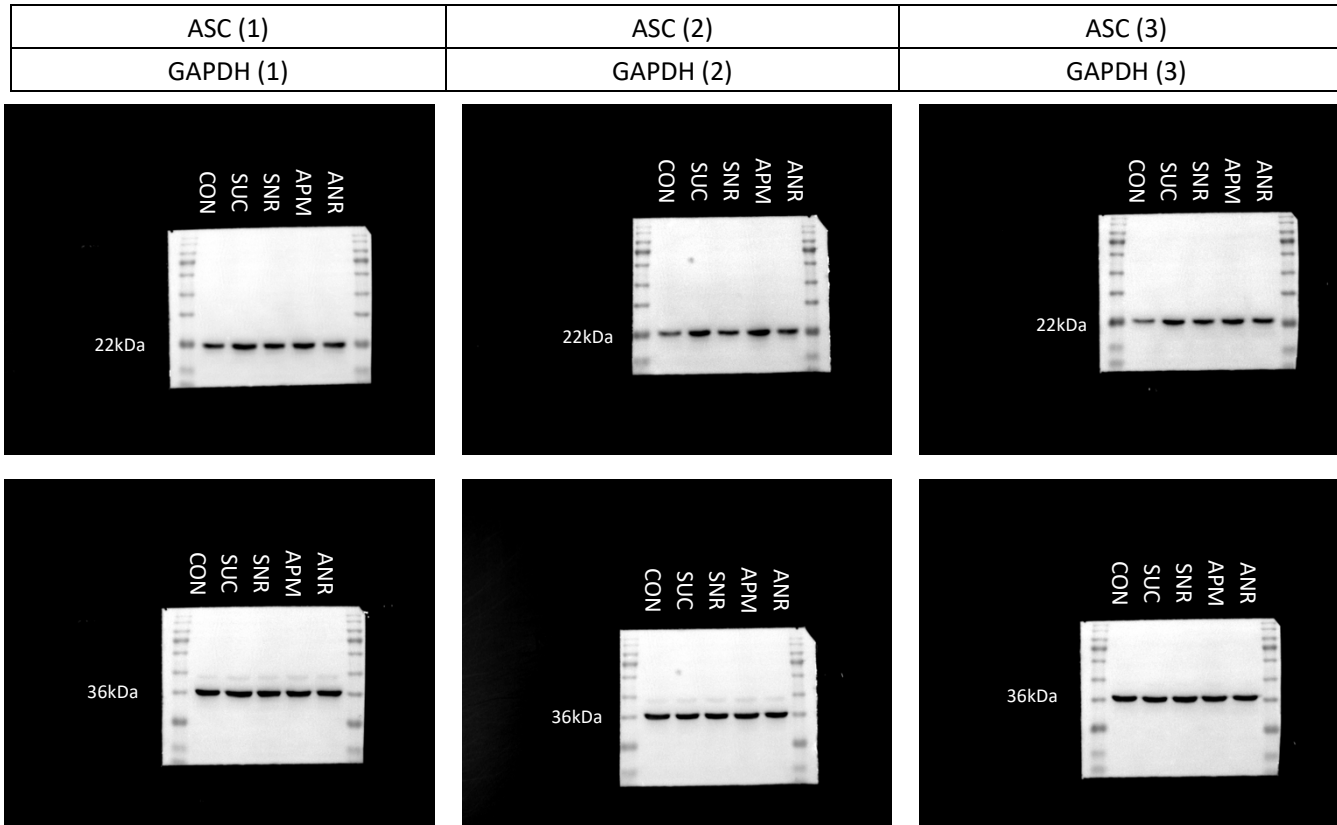
p-PI3K (1)	p-PI3K (2)	p-PI3K (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



P62 (1)	P62 (2)	P62 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)

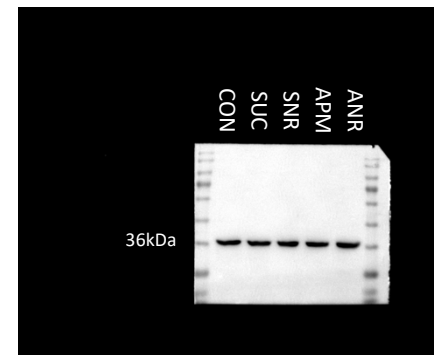
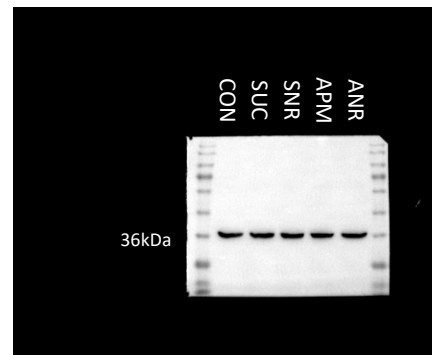
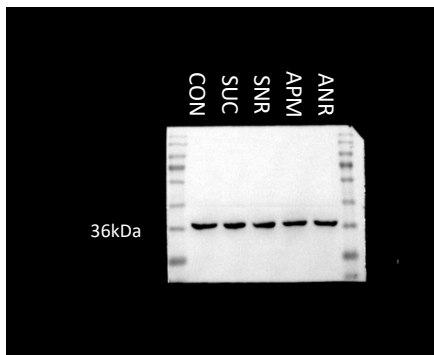
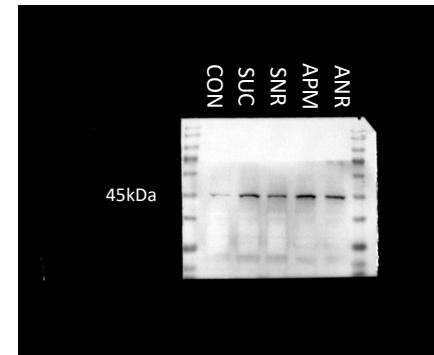
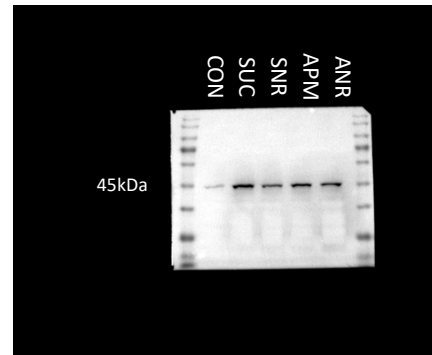
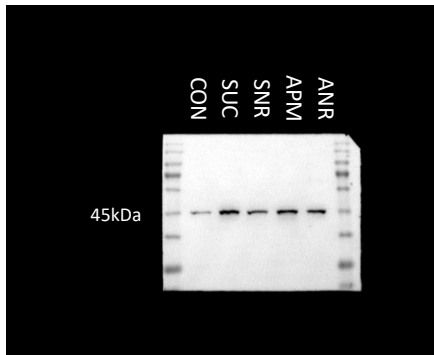


Hippocampus

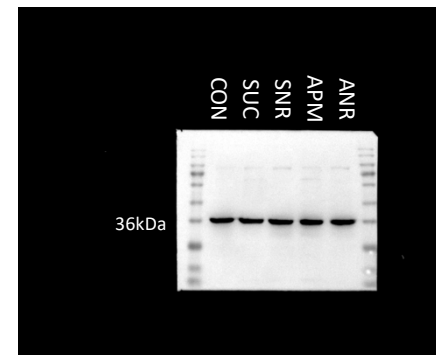
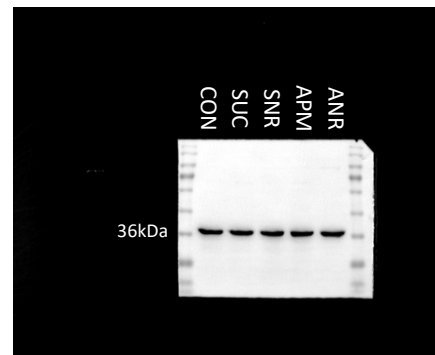
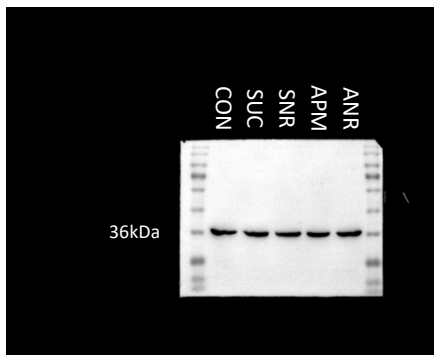
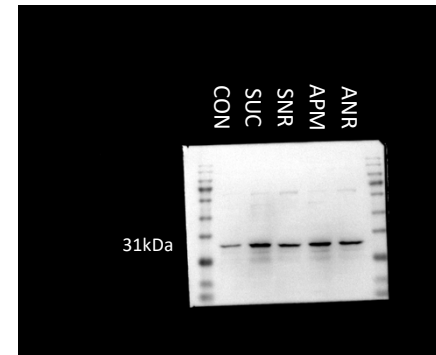
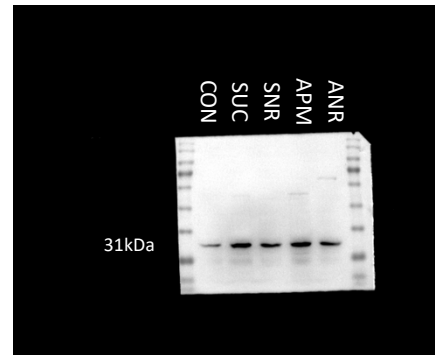
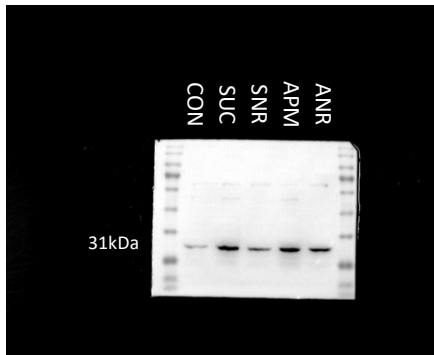




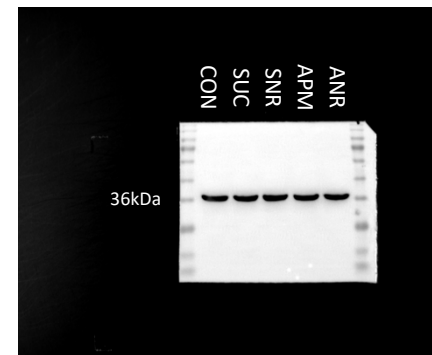
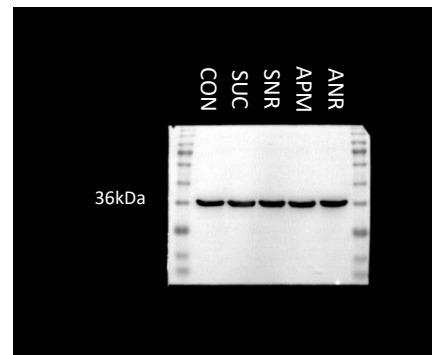
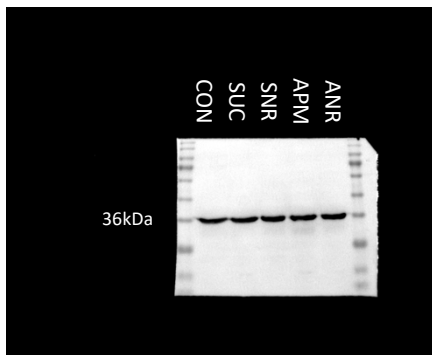
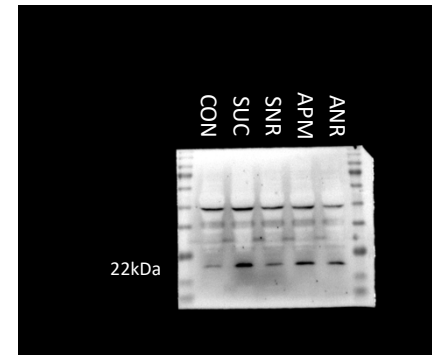
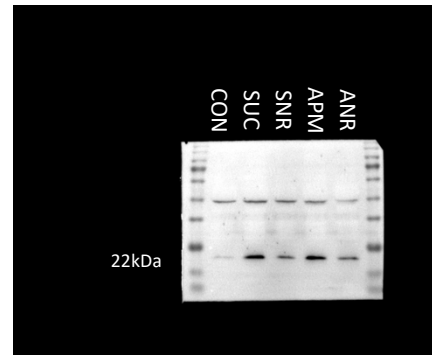
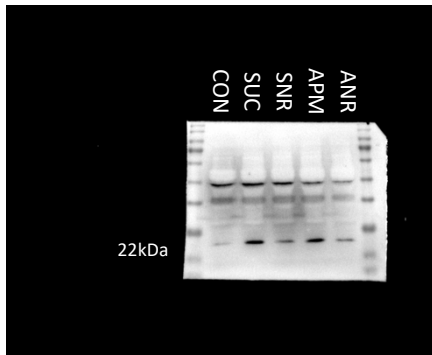
Caspase 1 (1)	Caspase 1 (2)	Caspase 1 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



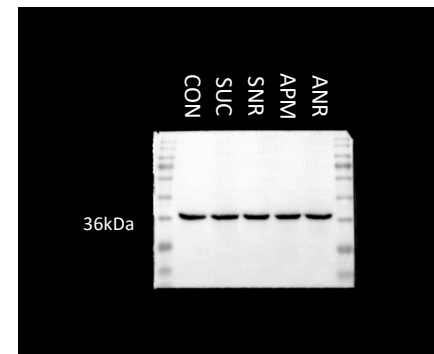
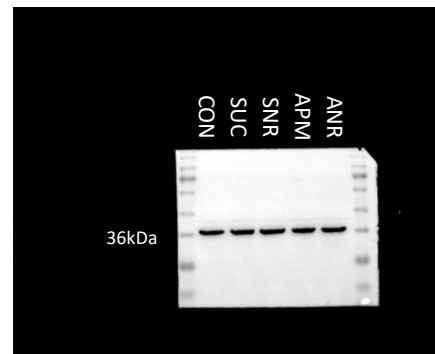
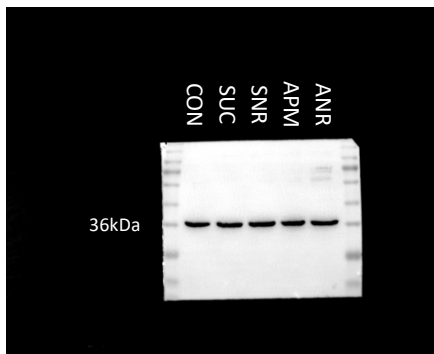
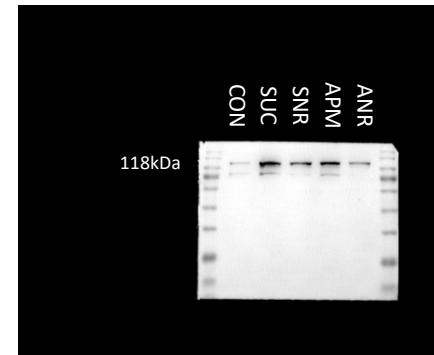
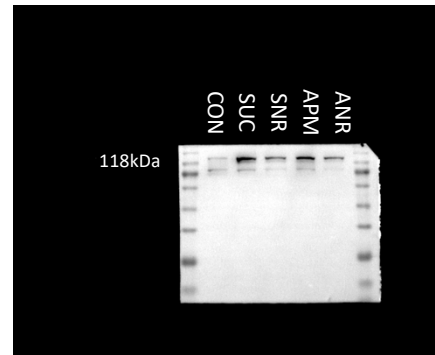
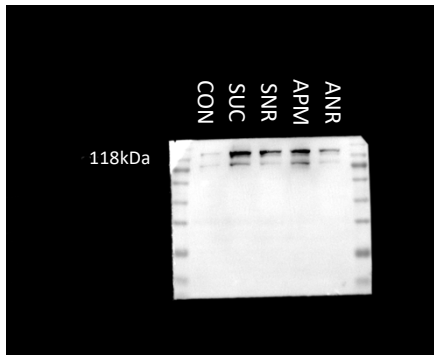
IL-1 $\beta$ (1)	IL-1 $\beta$ (2)	IL-1 $\beta$ (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



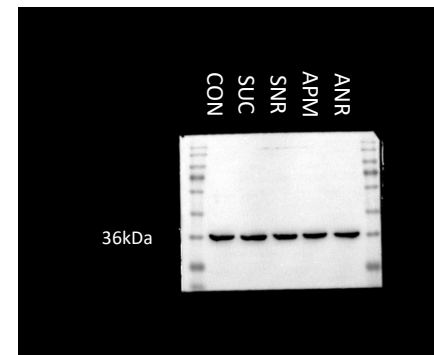
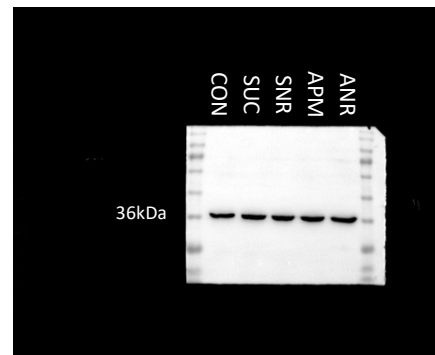
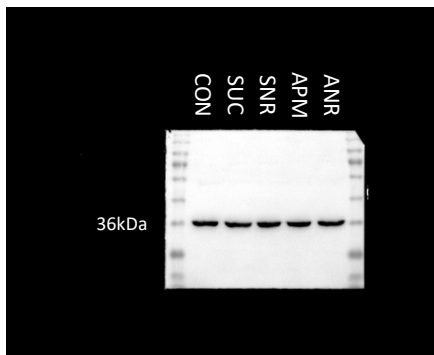
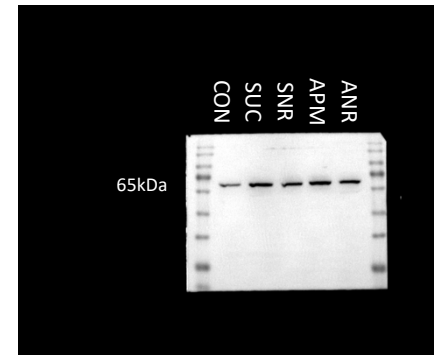
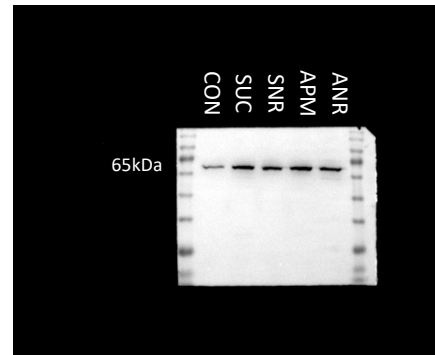
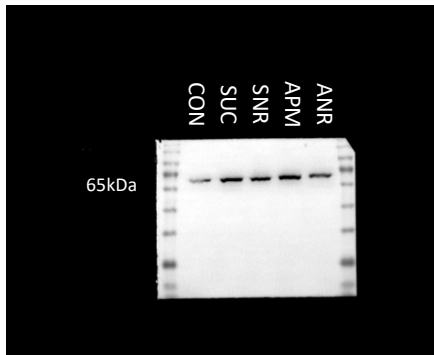
IL-18 (1)	IL-18 (2)	IL-18 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



NLRP3 (1)	NLRP3 (2)	NLRP3 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



NF- $\kappa$ B (1)	NF- $\kappa$ B (2)	NF- $\kappa$ B (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)



TLR4 (1)	TLR4 (2)	TLR4 (3)
GAPDH (1)	GAPDH (2)	GAPDH (3)

