

Supplemental Figure Legends

Figure S1: Effects of olaparib and niraparib treatment on CCA cell survival and proliferation

A) Cell viability analysis of CCA cell lines (KMCH-1, HuCCT1) after olaparib treatment for 72hr. B) Colony formation ability of HuCCT1 cells after niraparib treatment. Bar graph showing average colony number after different treatments. C) Spheroid formation of CHNG6 after treatment with various concentrations of niraparib. Cell cycle analysis of D) HuCCT1 or E) CHNG6 after niraparib treatment for 72hr. Bar graphs showing analysis of different cell cycle phases after vehicle or niraparib treatment. F) Cell cycle analysis of KMCH-1 cells treated with olaparib. * $P < 0.05$. P values were calculated using the two-sided Student's t test and data presented as mean+stdev.

Figure S2: Effects of niraparib treatment on apoptosis and caspase 3/7 activity

Apoptosis index of A) HuCCT1 or B) CHNG6 after niraparib treatment for 72hr. Bar graphs showing percentage of apoptotic cells after vehicle or niraparib treatment. Analysis of caspase3/7 activity in C) HuCCT1 or D) CHNG6 cells after niraparib treatment for 72hr. Bar graphs showing percentage of caspase3/7 positive cells after vehicle or niraparib treatment. E) Apoptotic index analysis of KMCH-1 cells after olaparib treatment. * $P < 0.05$. P values were calculated using the two-sided Student's t test and data presented as mean+stdev.

Figure S3: Effects of niraparib treatment on oxidative stress

Analysis of oxidative stress in A) HuCCT1 or B) CHNG6 cells after niraparib treatment for 72hr. Bar graphs showing percentage of ROS-VE and ROS+VE populations after drug treatment. C)

Oxidative stress analysis of KMCH-1 cells treated with olaparib. * $P < 0.05$. P values were calculated using the two-sided Student's t test and data presented as mean+stdev.

Figure S4: Niraparib induces DNA damage and replication fork stalling

Representative immunofluorescence images of A) γ H2AX, RAD51, B) pCHK2 and C) 53BP1 of HuCCT1 cells treated with niraparib for 72hr. D) Representative images of CldU and IdU positive HuCCT1 cells treated with niraparib for 48hr. E) Scatter plot showing ratio of IdU/CldU intensities in HuCCT1 cells treated with niraparib. Scale bar=20 μ m. * $P < 0.05$. P value for panel E was calculated using the two-sided Student's t test and data presented as mean+stdev.

Figure S5: Immunofluorescence quantification after niraparib treatment

Quantitative immunofluorescence quantification of several proteins in KMCH (A, C, E, G) and HuCCT1 cells (B, D, F, H) following niraparib treatment as indicated.

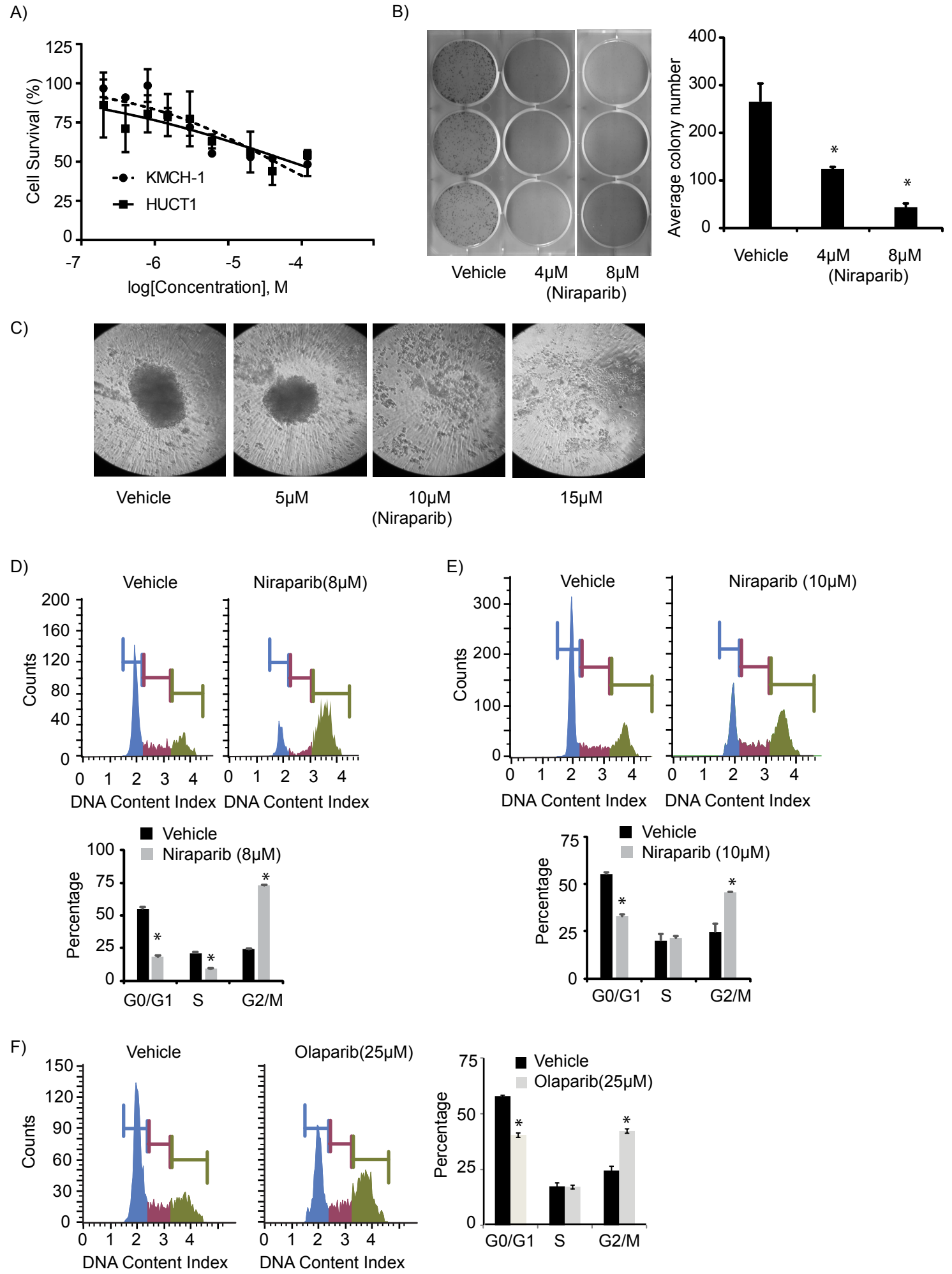
Figure S6: Original Western blots

Table S1

Genomic alterations in Cholangiocarcinoma samples (n=195) from cBioportal

Genes	Cases with mutations (%)
ARID1A	20.51
BAP1	13.3
ATM	7.7
ARID1B	2.6
ATR	2.1
BRCA1	2.1
BRCA2	1
FANCC	1
NBN	1
PALB2	1
ATRX	0.5
BARD1	0.5
BRIP1	0.5
RAD50	0.5
CHEK1	0.5
BLM	0
CHEK2	0
FANCA	0
FANCD2	0
FANCE	0
FANCF	0
FANCG	0
FANCL	0
MRE11	0
RAD51	0
RAD51B	0
RAD51C	0
WRN	0

Figure S1



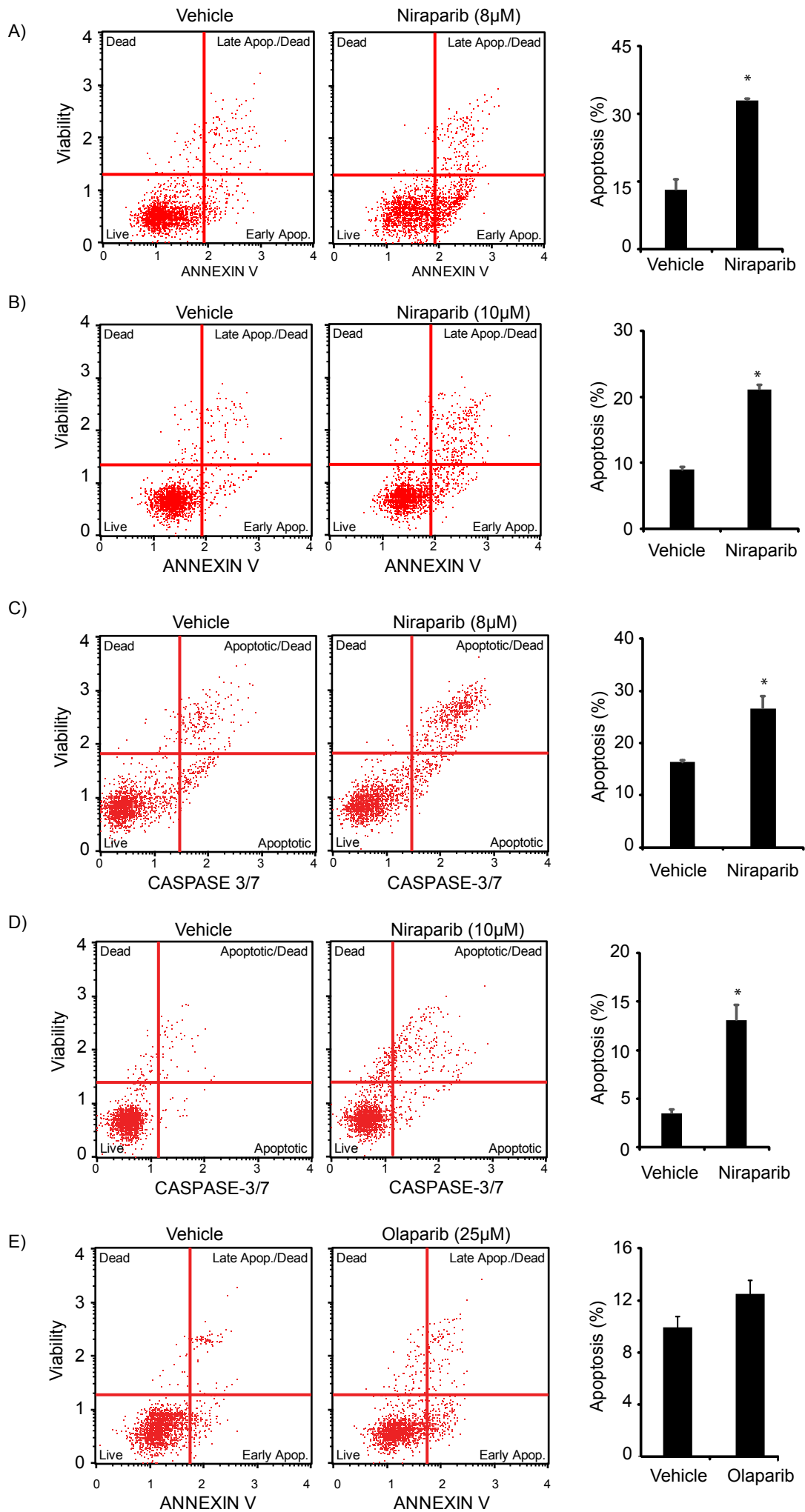


Figure S3

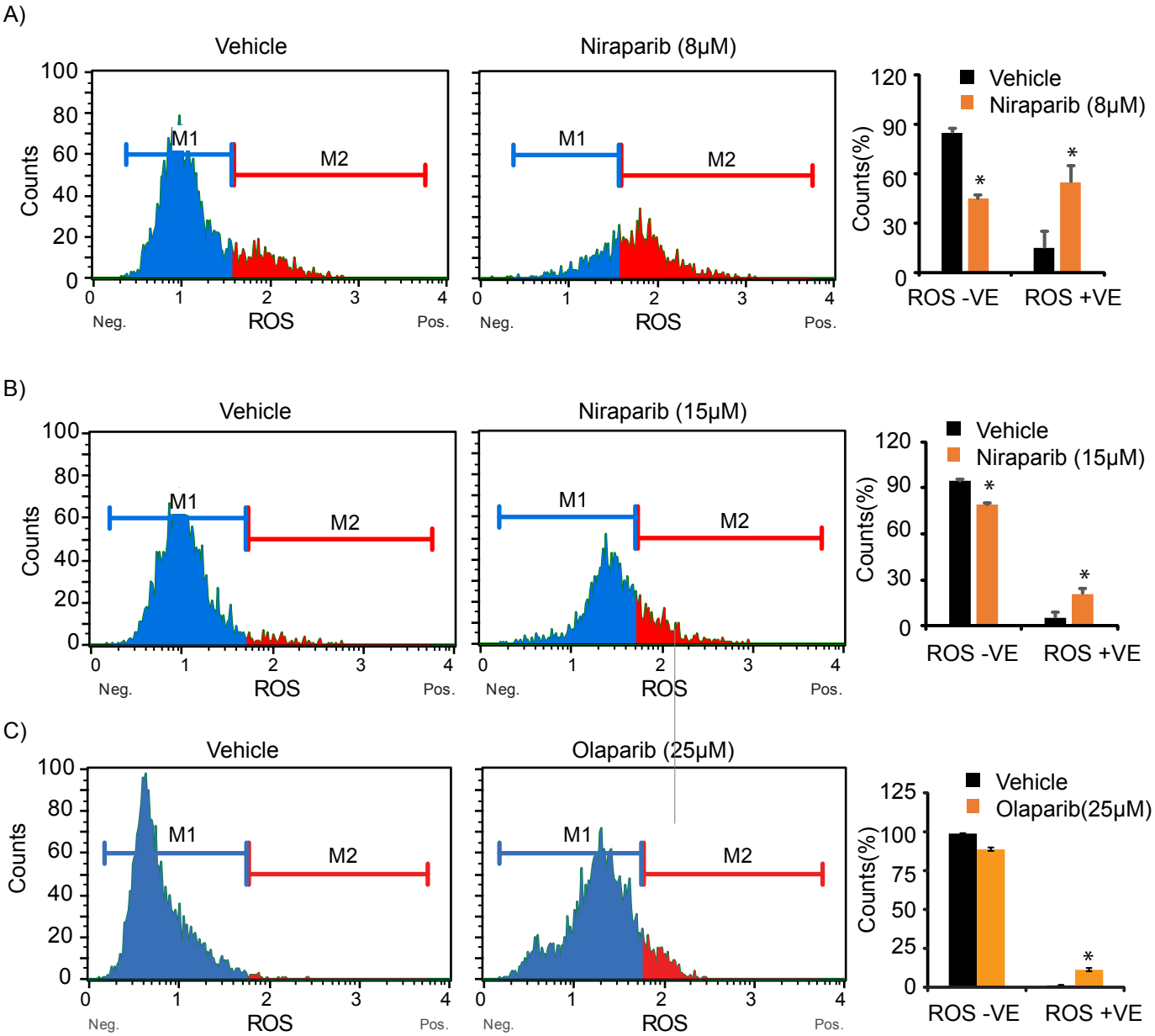


Figure S4

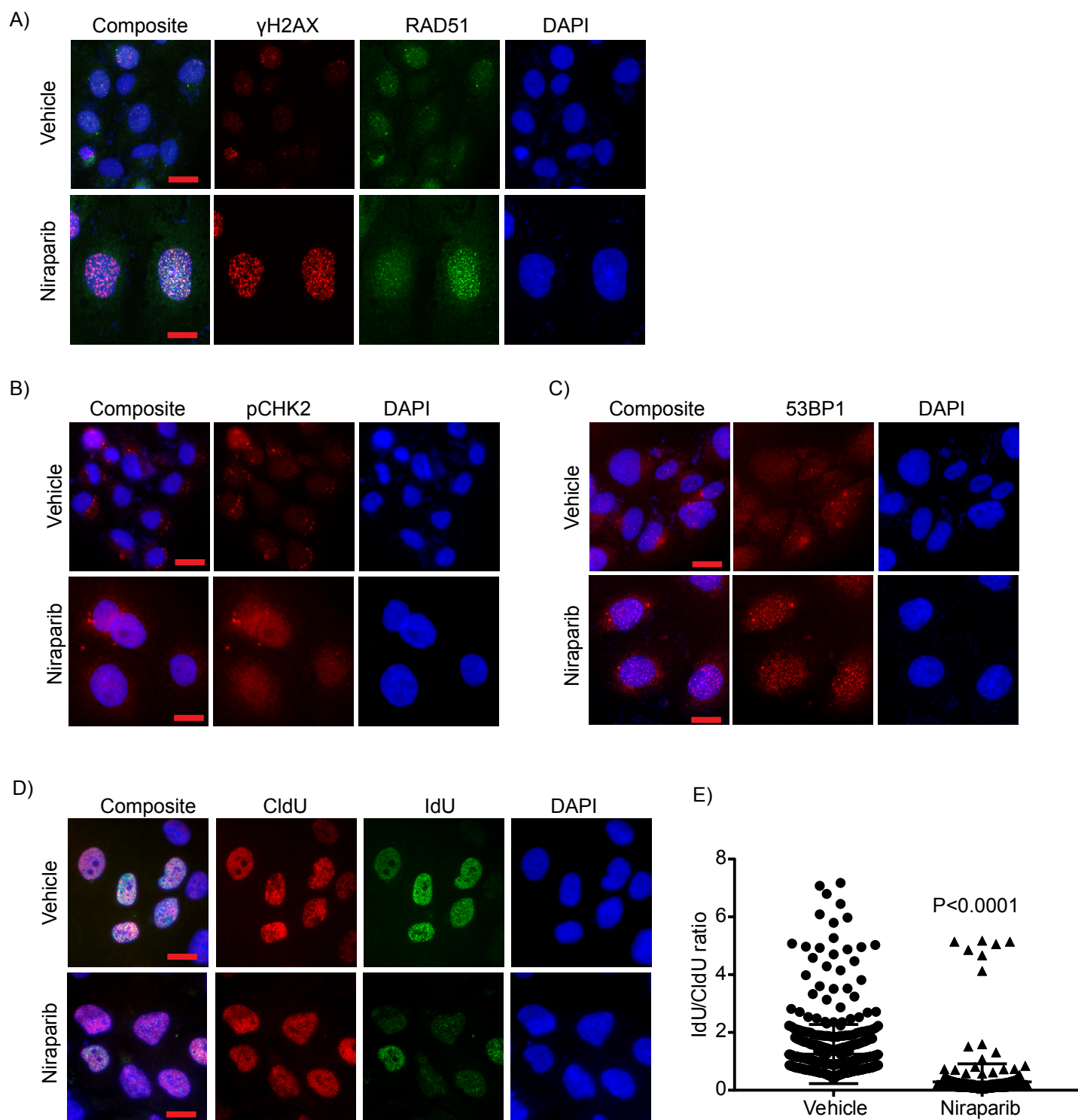


Figure S5

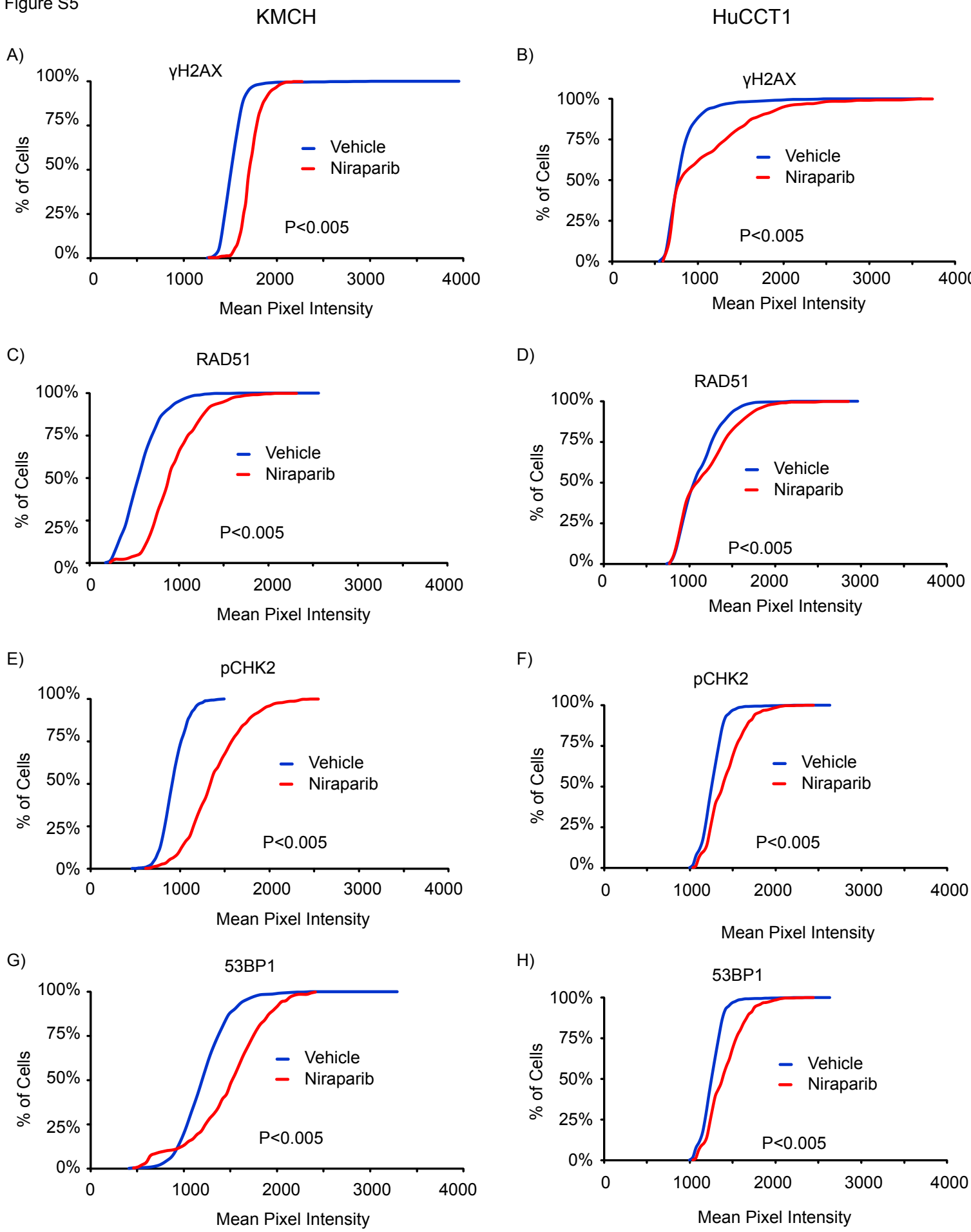


Figure S6

Blots for Figure 2E, KMCH-1

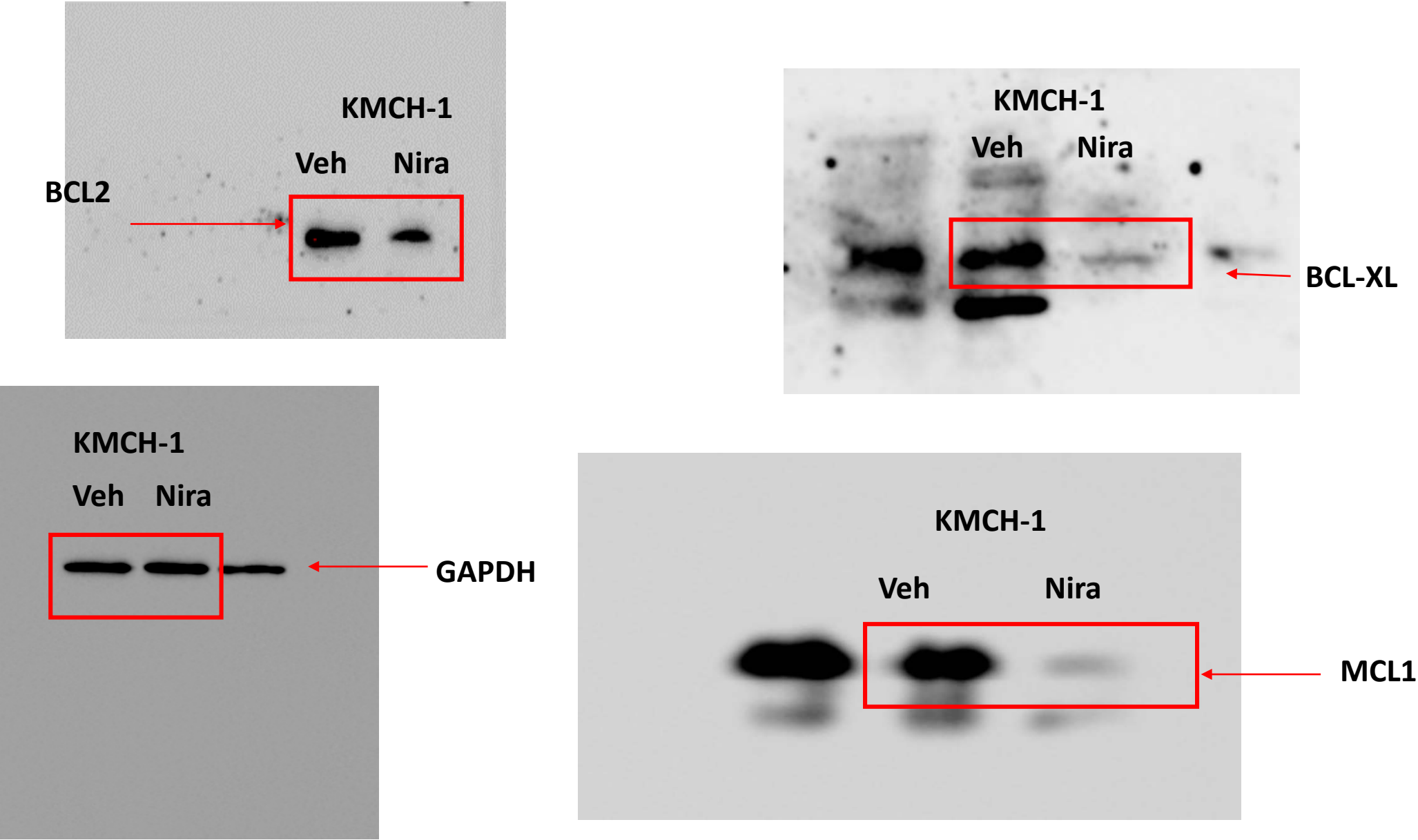


Figure S6

Blots for Figure 2F, HuCCT1

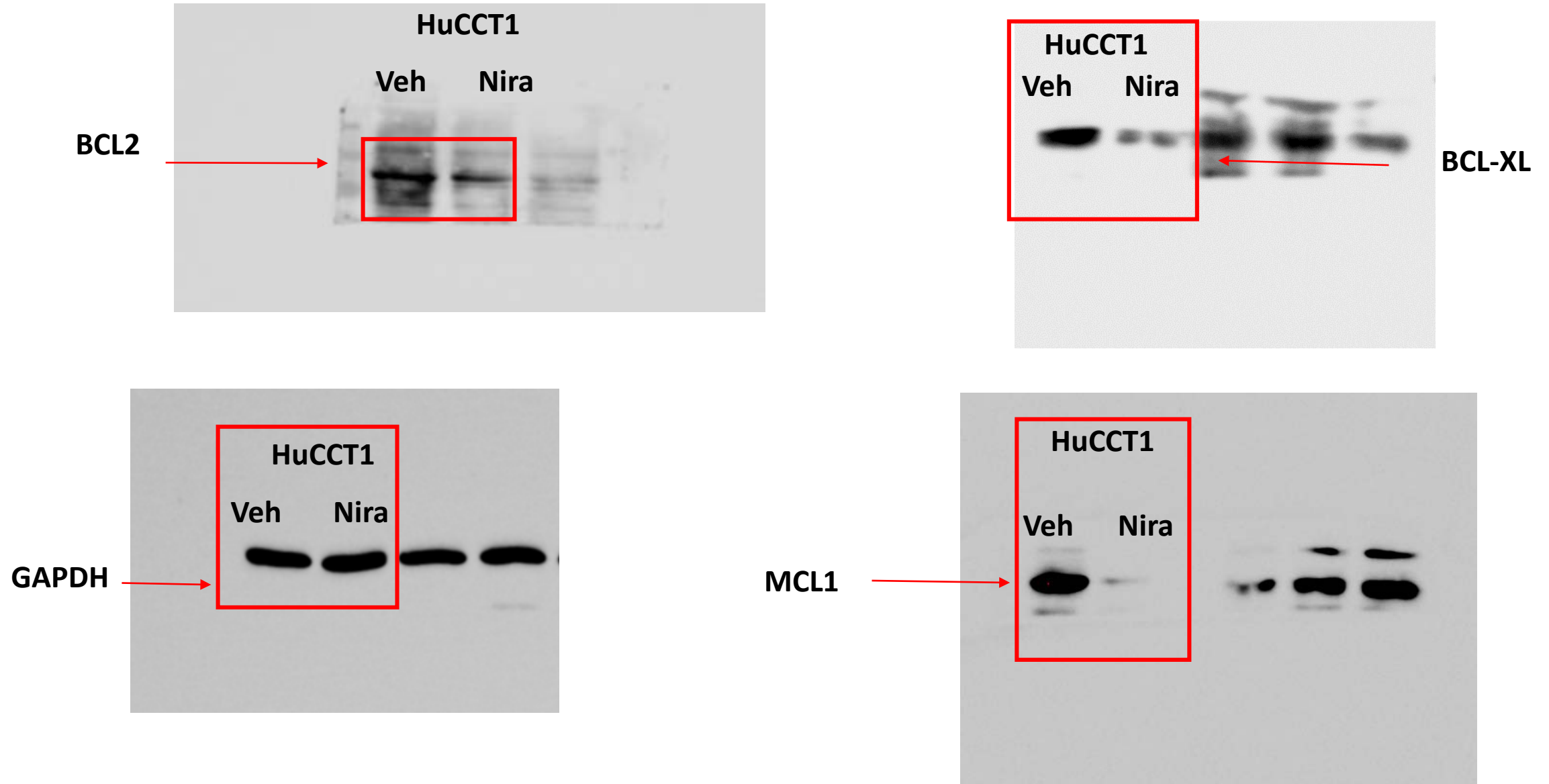


Figure S6

Blots for Figure 2G, CHNG6

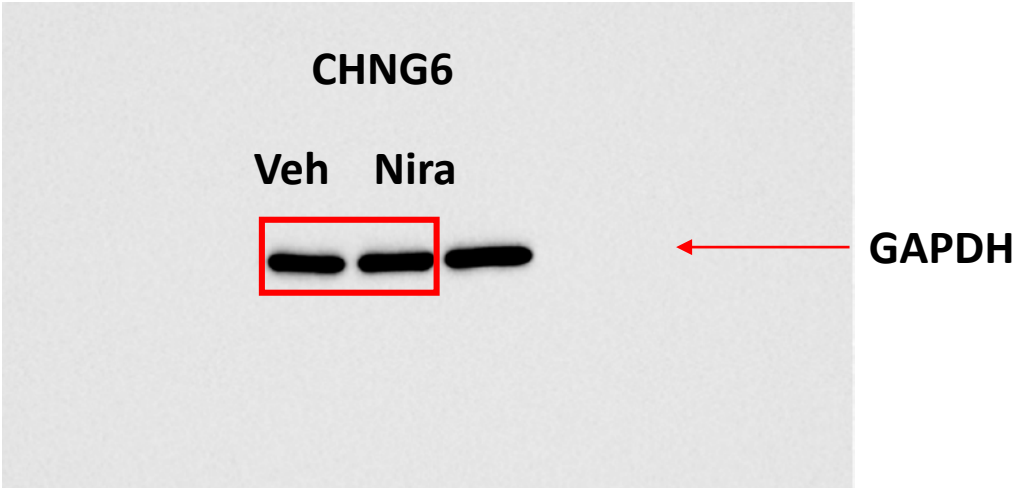
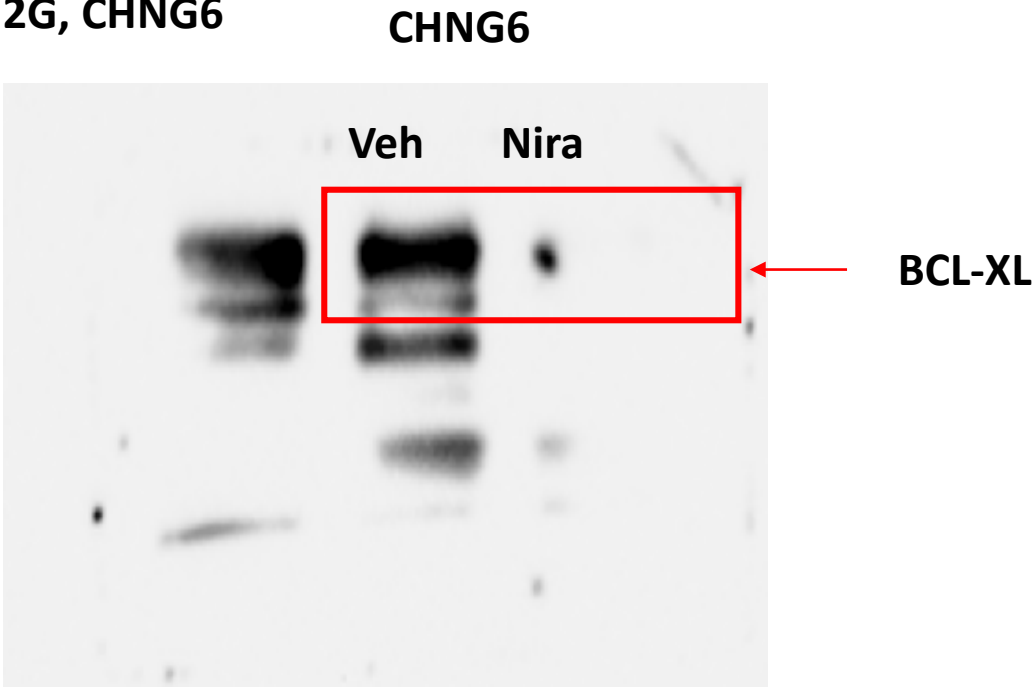
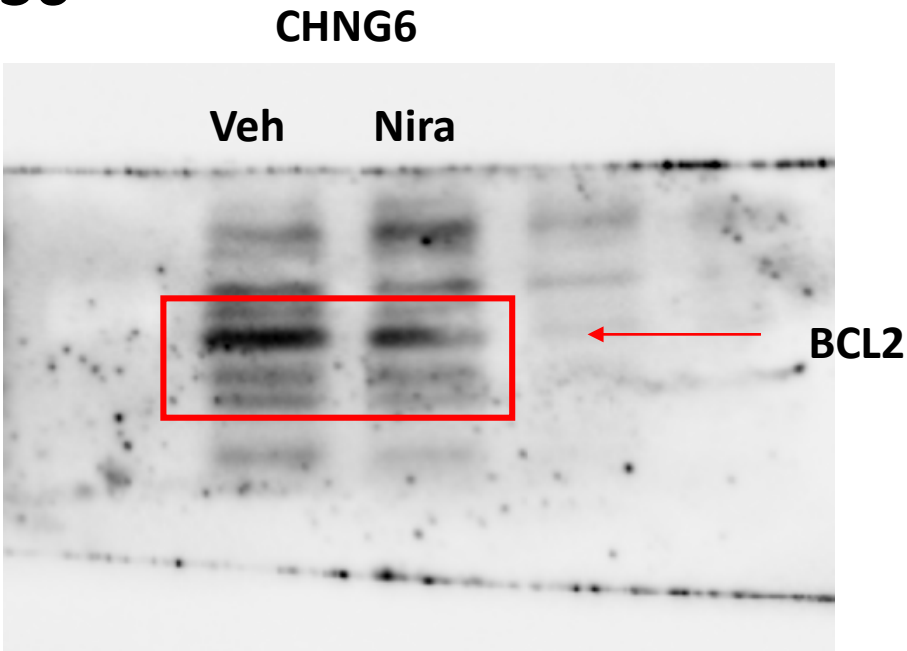


Figure S6

Blots for Figure 2H, CHNG31

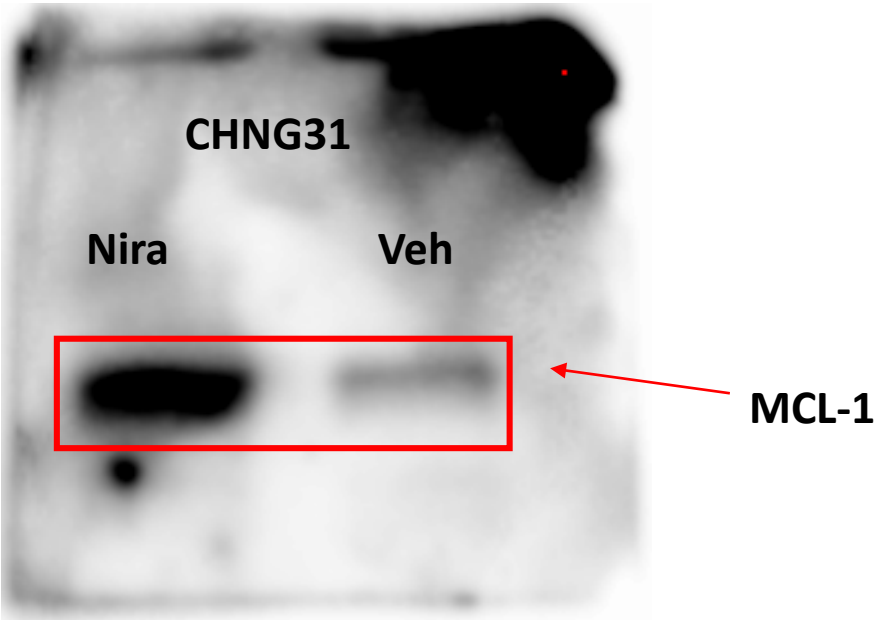
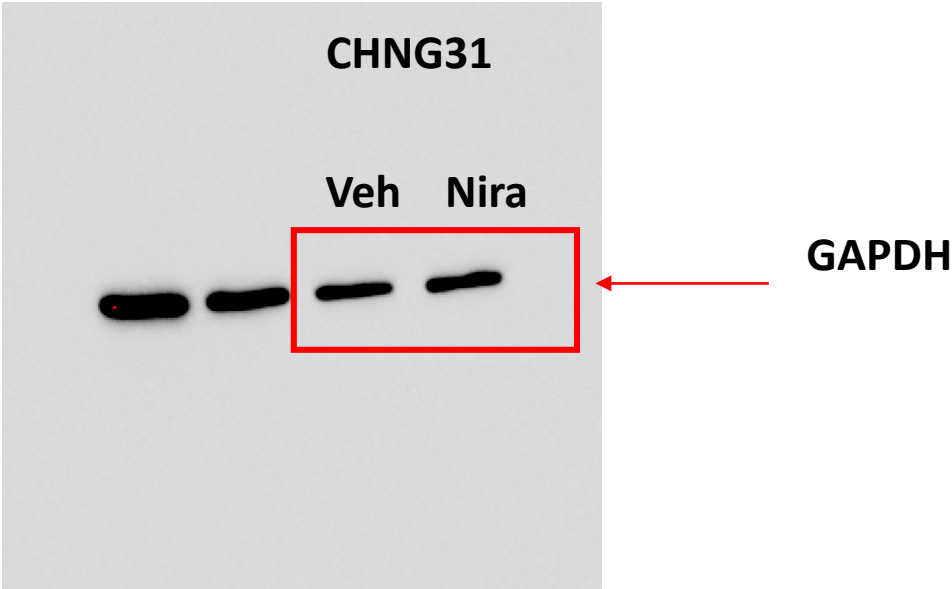
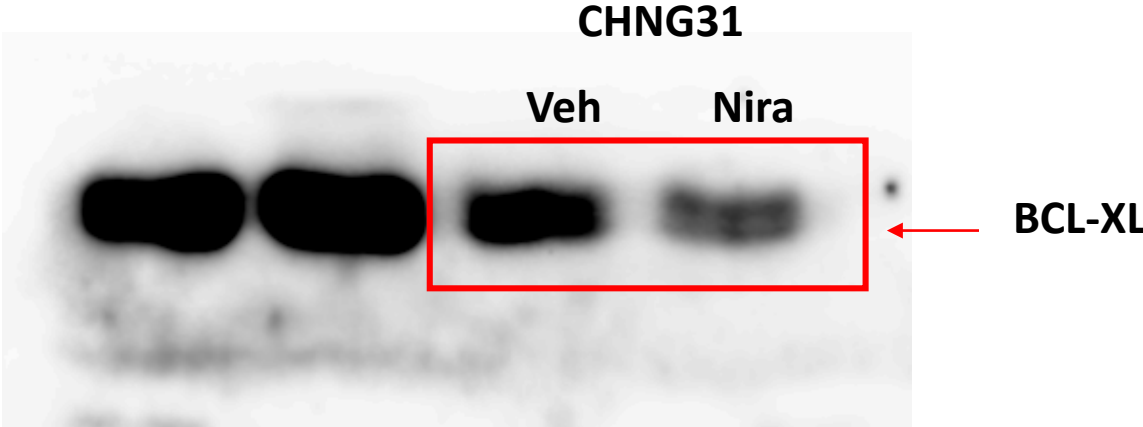
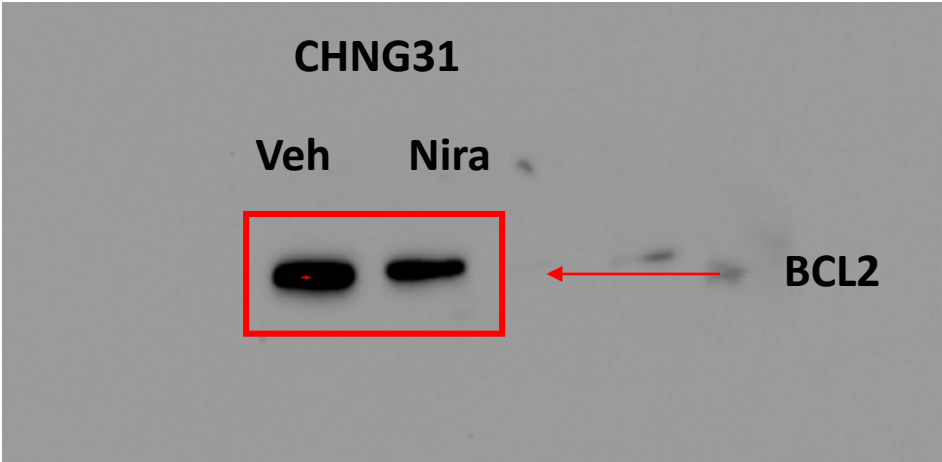


Figure S6

Blots for Figure 3C, KMCH-1

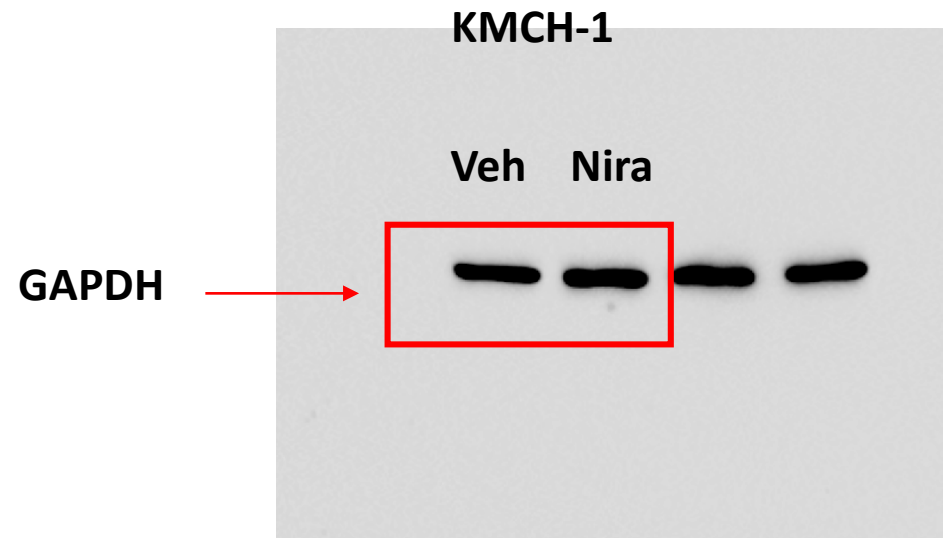
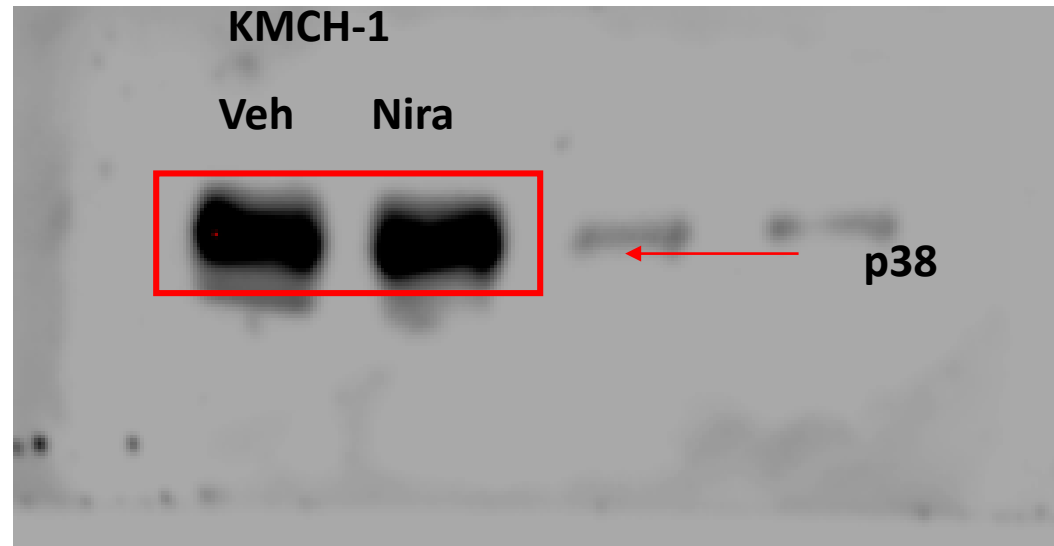


Figure S6

Blots for Figure 3D, HuCCT1

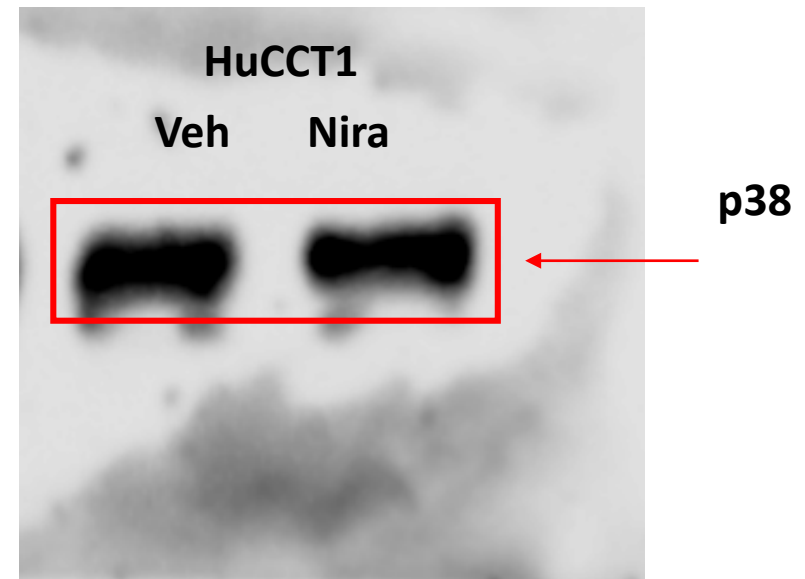
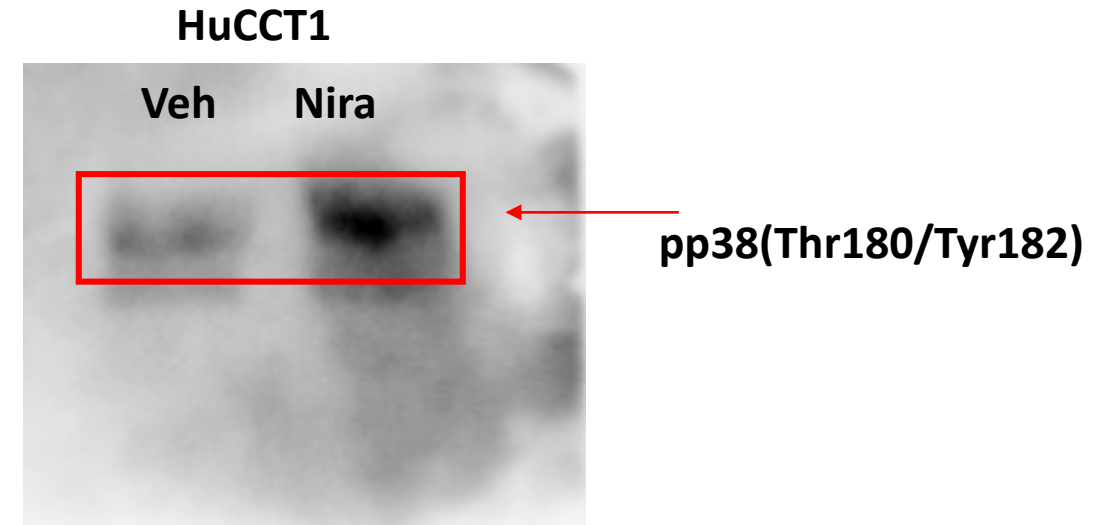
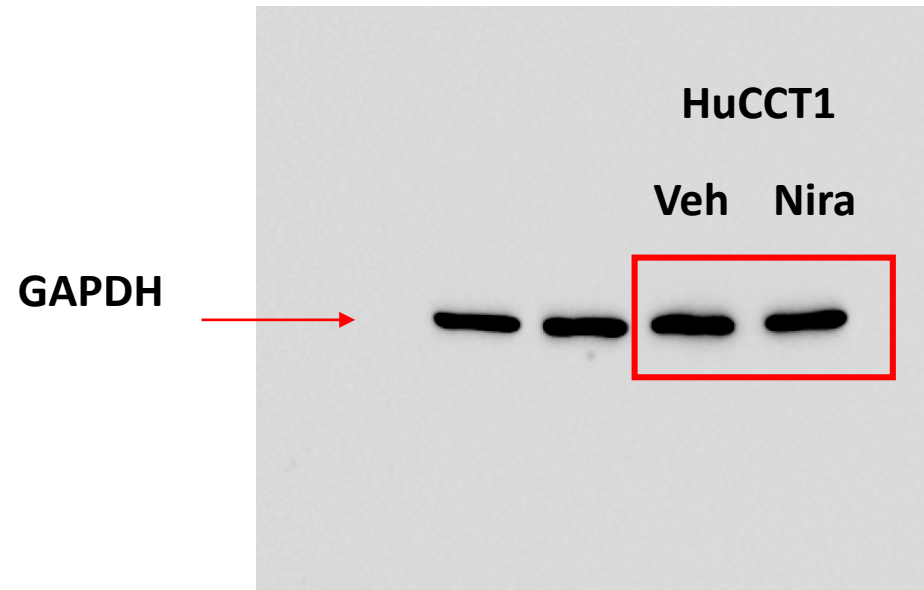


Figure S6

Blots for Figure 3E, CHNG6

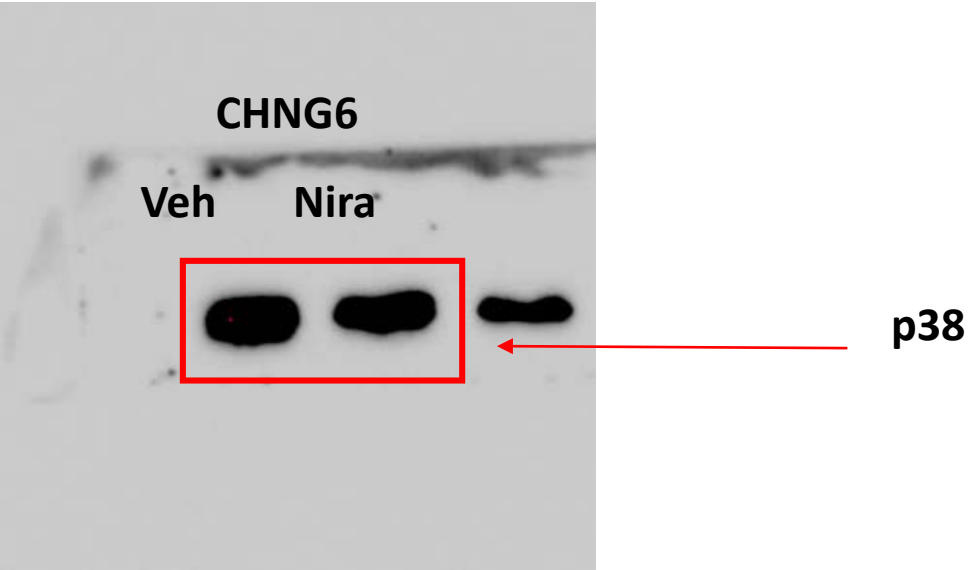
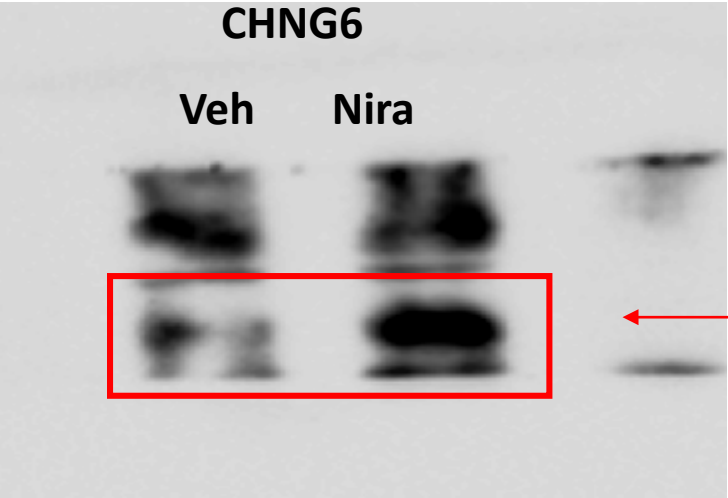
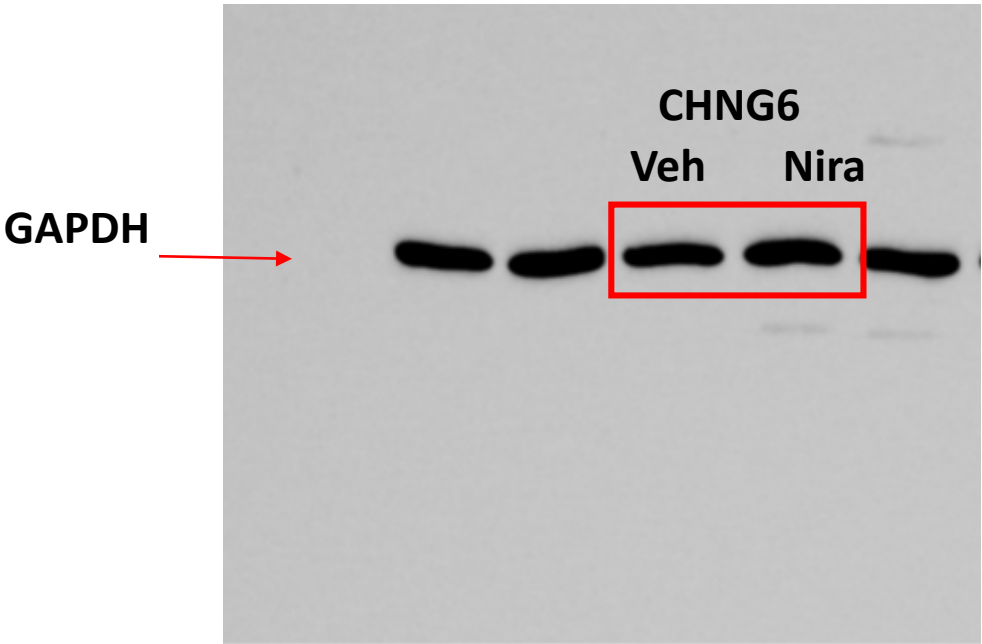


Figure S6

Blots for Figure 3F, CHNG31

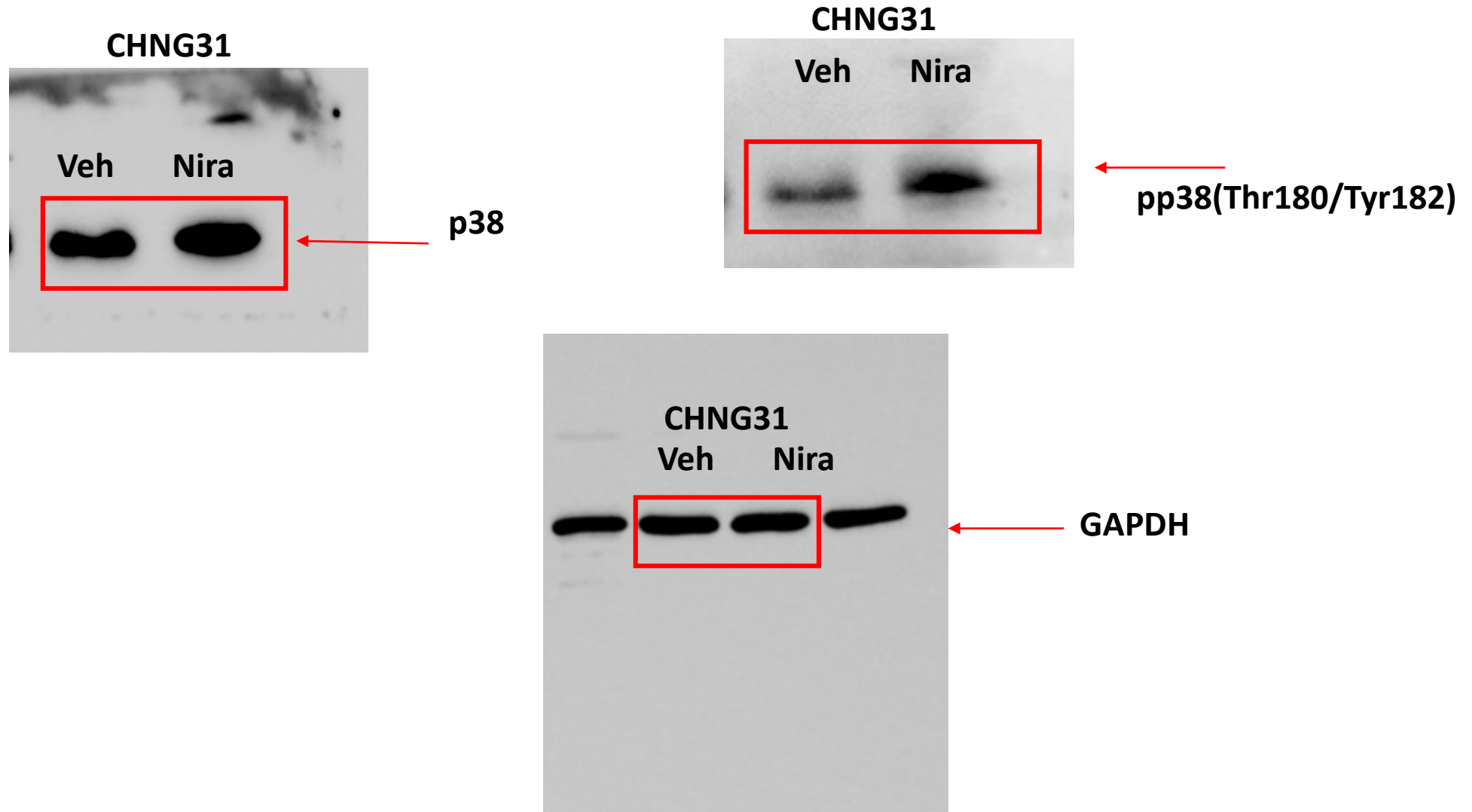


Figure S6

