



A.

1 10 20 30 40 50 60 70 80 90

CAPN7 **M D A T A L E R D A V Q F A R L A V Q R D H E G R Y S E A V F Y Y K E A A Q A L I Y A E M A G S S L E N I Q E K I T E Y L E R V Q A L H S A V Q S K S A D P L K S K H O L D L E R A H F L V T Q A F D**

100 110 120 130 140 150 160 170 180 190

CAPN5 ----- **M F S C V K P Y E D Q N Y S A L R R D C R R R K V L F E D P L** -----

CAPN2 M A G I **A A K L A K Q R E A A E G L G S H D R A I K Y L N O D Y E A L R N E C L E A G T L F C D P S** -----

CAPN7 **E D E K E N V E D A I E L Y T E A V D L C L K T S Y E T A D K V L Q N K L Q L A R Q A L D R A E A L G E P L T K P V G K I S S T S V K P K P P P E R A H F L P L G A N P F L E R Q S F I S P Q S C D**

CAPN10 M R A G R G A T P A R E L F R **D A A** -----

200 210 220 230 240 250 260 270 280 290

CAPN5 ----- **F P A T D D S L Y Y K G T** ----- P G P A V R **N K R P K G I C E D P R L F V D G I S S H D L H Q G Q V G N C W F V A A C**

CAPN2 ----- **F P A I P S A L G P K E L G P Y S S K T R G I E W K R P T E I C A L P Q F I I G G A T R T D I C C G A L G D C W I L A A I**

CAPN7 **A Q G Q R Y T A E E I E V L R T T S K I N G I E Y V P F M N V D L R E R F A Y P M P F C D R W G K L P L S P K Q K T F S K W V R P E D T T N N E T M I Y T - V S F S I K C T I V S D C S E V A S L**

CAPN10 ----- **F P A A D S S L F C D L S T P L A Q F R E D I T W R R P O E I C A T P R L F P D D P R E G Q V K O G L L G D C W I L A C**

300 310 320 330 340 350 360 370 380 390

CAPN5 **S S L A S R E S L W Q K V I P D W K** --- E Q E W D P E K P N A Y A C I **E H F H W R F G E W V D V V I D D R L P T V N - N O L I Y C H S N S R N E F W C A L V E K A Y A K I A G C Y Q A L D G G N T**

CAPN2 **A S I T L N E E I L A R V V P L N Q** --- S F Q E N --- Y A C I **E H F Q F W Q Y G E W V E V V D D R L P T K D - G E I L L F V H S A E G S E F W S A L L E R A Y A K I N G C Y E A L S G G A T**

CAPN7 **A I S A A Y E R R F N K K I T G I I Y P Q N K D G - E P E Y N P C E K Y M V K L H L N G V P R K V I I D D O L P V D H K G E I L L C S Y S N N K S E L W S L I E K A Y M K V M G G Y D F P - G S N S**

CAPN10 **A A L Q K S R H L L Q V I P P G P S W A D** --- Q E Y R C S **E T C R I W Q F G R W V E T T D D R L P C L A - G R I C F S R C Q R E D V F W L P L L E R V A K V H G S Y E H L W A G Q V**

400 410 420 430 440 450 460 470 480 490

CAPN5 **A D A L V D F T G G V S E P I D I T E G D F A N D E T K R N Q L F E R M L K V H S R G G I I S A S I K A V T A A D M E A R L A C G L V K C H A Y A V T D V R K V R L G H G L L A F F K S E K I D M I R**

CAPN2 **T E G F E D F T G G I A E W Y E L K K** --- P P P N L F K I I Q R A L Q **K G S L I G C S I D I T S A A D S E A I T F Q K L V K C H A Y S V T G A E E V E S** --- N G S L Q K L I R

CAPN7 **N I D L H A L T G W I P E R I A M H S** --- D S Q T F S K D N S F R M L Y Q R F H **K G D V I T A S T G M M T E A E G E K - W G L V P T H A Y A V L D I R E F K G** --- L R F I Q

CAPN10 **A D A L V D L T G G L A E R W N L K G - V A G S G G Q D R P G R W E H R T C R L L H L K D Q C L I S C C V L S P R A G A R E L G E F H A F I V S D L R E L O G** --- Q A G Q C I L L R

500 510 520 530 540 550 560 570 580 590

CAPN5 **L R N P W G E R E W N C P W S D T - S E E W Q V K S K S E R - E K M G V T V Q D D G E F W M T F E D V C R Y F T D I I K C R - V I N T S H L S - I H K T W E E A R** --- L H G A W T L H E D P R Q N

CAPN2 **L R N P W G E V E W I C R W N D N - C P S W N T I D P E E R - E R L - T R R H E D G E F W M S F S D F L R H Y S R I E L C N - L T P D T L T S D T Y K K W K L T K** --- M D G N W R --- R G S

CAPN7 **L K N P W S H L R W K C R Y S E N D V E N W T P E L Q K Y L N F D P R T A Q K I D N G I F W I S W D D L C Q Y V D V I Y L S W N P G L F K E S T C I H S T W D A K Q G** --- P V K

CAPN10 **L O N P W G R R C W Q C L W R E G - G E G N S O V D A A V A - S E L S Q L O E - G E F V V E E E F L R E F E I V G Y P V T E A G H L Q S L Y T E R L L C H T R A L P G A W V** --- K G Q

600 610 620 630 640 650 660 670 680 690

CAPN5 **R G G G C I N** --- H K D T F F Q --- N P Q Y I F E V K K P E D E --- V I I C I Q Q R P K R S T R R E G K G E N L A I G F D I Y K V E E N R Q --- Y R M H S L Q

CAPN2 **T A G G C R N** --- Y P N T F W M --- N P Q Y L I K L E E E D E D E D G E S G C T F L V G L I Q K H R R R Q R K M G - E D M H T I G F G I Y E V P E L S G Q T N I H L S K N F L T N R

CAPN7 **D A Y S L A N** --- N P Q Y K L E V Q C P Q G G --- A A V W V L L S R H I T D K D D F A N N R E E I T M V V Y K T D G K K V Y --- Y P A D P

CAPN10 **S A G G C R N N S G F P S N P K F W L R V S E F S E V Y I A V L O R S R L H A A D W A G R A R A L V G D S H T S W S P A S I P G - K H Y Q A V G L H L W K V E K R R V N** --- L P R V L S M P

700 710 720 730 740 750 760 770 780 790

CAPN5 **H K A A S S I Y I N S R S V F I R T D Q P E G** --- R Y V I I P T E F E P G H T G E F L L R V F T D V P S N C R E I R --- L D E P P H T C W S S L C G Y P Q L V T Q V H V

CAPN2 **A R E R S D T F E I N L R E V L N R F K L P P G** --- E Y I L V P S T E F E P N K D G D F C I R V F S E K K A D Y Q A V D D E I E A N L E E F D I S E D D I D D G F R R L F A Q L A G E D A E I S A F E L

CAPN7 **P P Y I D G I R I N S P H Y L T K I K L T T P G T H T F T L V V S C Y E K Q N T I H Y T V R V Y S A C S F T F S R I P** --- S P Y T L S K R I N G K W S G Q S A G G C G N F

CAPN10 **P V A G T A C H A Y D R E V H L R C E L S P G** --- Y Y L A V P S T E L K D A P G E F L L R V F S T G R V S L S A I R --- A V A K N T P P G A A L P A G E W G T V Q L R G S W R V

800 810 820 830 840 850 860 870 880 890

CAPN5 **L G A A G** --- L K D S --- P T G A N S Y V I I K C E G D K V R --- S A V Q K G T S T P E Y N V K G I F Y R K K L S Q P - I T V Q V N H R V L K D

CAPN2 **Q T I L R R V L A K R Q D I K S D G F S I E T C K I M V D M L D S D G S G K L G L K E F Y I L W T K I Q K Y Q** --- K I Y R E I D V D R S G T M N S Y E M R K A L E E A G F K M P C Q L H Q V I V A

CAPN7 **Q E T H K** --- N N P I Y Q F H I E K T G P L L I E L R G P R Q Y S --- V G F E V V T V S T L G D P G P H G F L R K S S G D --- Y R C G F C Y L E T E N

CAPN10 **G Q T A G G S R N F A S Y P T N P C F P** --- F S V P E G P G P R C V R I T L H Q H C R P S D T E F H P I G F H I F O V P E G G R S Q D A P P L L L Q E P L S C V P H R Y A Q E V S R I C L

900 910 920 930 940 946

CAPN5 **E F L G Q V H L K A D P D N L Q A L H T L H L R D R N S R Q P S - N L P G T V A V H I L S S T S L M A V**

CAPN2 **R F A D D Q L I I D F D N F V R C L V R L E T L F K I F K Q L D P E N T G T I E L D L I S W L C F S V L**

CAPN7 **I P S G I F N I I P S T F L P K Q E G P F F L D F N S I I P I K I T Q L Q**

CAPN10 **L P A G T Y K V V P S T Y L P D T E G A F T V T I A T R I D R P S I H S Q E M L G Q F L Q E V S I M A V M K T**

B.

118 Amino Acids



1 10 20 30 40 50 60 70 80 90 100

M G M F S C V K P Y E D Q N Y S A L R R D C R R R K V L F E D P L F P A T D D S L Y Y K G T P G P A V R W R K P K G I C E D P R L F V D G I S S H D L H Q G Q V G N C W F V A A C S S L A S R E S L W Q K V I

110 120 130 140 150 160 170 180 190 200

P D W K E Q E W D P E K P N A H N N N N N P I D L T E G D F A N D E T K R N Q L F E R M L K V H S R A A H N N K V S K S E R E K M G V T V Q D G G G G H I F E V K K P E D E V L I C I Q Q R P K R S T R R E G

210 220 230 240 250

K G E N N N N N N K A D P D N L Q A L H T L H L R D R N S R Q P S N L P G T V A V H I L S S T S L M A V

Figure S1. CAPN5 mutations present in cancerous tissues. CAPN5 mutations were investigated in cancer using the COSMIC database. The following graph shows the number of times a CAPN5 missense mutation that changed the amino acid properties was found in the proteolytic core. The data is categorized by cancer tissue type.

Figure S2. CAPN5 custom antibody recognizes sequences unique to CAPN5. A. A sequence alignment of the calpains present in the human retina; CAPN2, CAPN5, CAPN7, and CAPN10. The underlined portions correspond to the polypeptide used to create the custom antibody. **B.** The customized CAPN5 polypeptide injected into rabbits. Linker sequences were used to connect sequences from the different domains (not underlined).