

AMINO ACID SEQUENCES IN CYTOCHROME-C PROTEINS FROM 20 DIFFERENT SPECIES

	10	20	30	40	50
<u>Amino Acid Number</u> -->	1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9				
<u>Human</u>	- - - - -	G D V E K G K K I F I M K C S O C H T V E K G G K H K T G P N L H G L F G R K T G Q A P G Y S Y T A A			
<u>Rhesus monkey</u>	- - - - -	G D V E K G K K I F I M K C S Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A P G Y S Y T A A			
<u>Horse</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A P G F T Y T D A			
<u>Pig, cow, sheep</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A P G F S Y T D A			
<u>Dog</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A P G F S Y T D A			
<u>Gray whale</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A V G F S Y T D A			
<u>Rabbit</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A V G F S Y T D A			
<u>Kangaroo</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L N G I F G R K T G Q A P G F T Y T D A			
<u>Chicken, Turkey</u> ...	- - - - -	G D I E K G K K I F V Q K C S Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A E G F S Y T D A			
<u>Penguin</u>	- - - - -	G D I E K G K K I F V Q K C S O C H T V E K G G K H K T G P N L H G I F G R K T G Q A E G F S Y T D A			
<u>Pekin duck</u>	- - - - -	G D V E K G K K I F V Q K C S Q C H T V E K G G K H K T G P N L H G L F G R K T G Q A E G F S Y T D A			
<u>Snapping turtle</u> ...	- - - - -	G D V E K G K K I F V Q K C A Q C H T V E K G G K H K T G P N L N G I L G R K T G Q A E G F S Y T E A			
<u>Bullfrog</u>	- - - - -	G D V E K G K K I F V Q K C A Q C H T C E K G G K H K V G P N L Y G L I G R K T G Q A A G F S Y T D A			
<u>Tuna</u>	- - - - -	G D V A K G K K T F V Q K C A Q C H T V E N G G K H K V G P N L W G L F G R K T G Q A E G Y S Y T D A			
<u>Screwworm fly</u>	- - -	G V P A G D V E K G K K I F V Q R C A Q C H T V E A G G K H K V G P N L H G L F G R K T G Q A A G F A Y T N A			
<u>Silkworm moth</u>	- - -	G V P A G N A E N G K K I F V Q R C A Q C H T V E A G G K H K V G P N L H G F Y G R K T G Q A P G F S Y S N A			
<u>Wheat</u>	A S F S E A P P G N P D A G A K I F K T K C A Q C H T V D A G A G H K Q G P N L H G L F G R Q S G T T A G Y S Y S A A				
<u>Fungus (Neurospora)</u>	- - -	G F S A G D S K K G A N L F K T R C A E C H G E G G N L T Q K I G P A L H G L F G R K T G S V D G Y A Y T D A			
<u>Fungus(baker's yeast)</u>	- - -	T E F K A G S A K K G A T L F K T R C E L C H T V E K G G P H K V G P N L H G I F G R H S G Q A Q G Y S Y T D A			
<u>Fungus (Candida)</u>	- - -	P A P F E O G S A K K G A T L F K T R C A E C H T I E A G G P H K V G P N L H G I F S R H S G Q A Q G Y S Y T D A			

[CONTINUED FROM ABOVE]

	60	70	80	90	100	110
<u>Amino Acid Number</u> -->	0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2					
<u>Human</u>	N K N K G I I W G E D T L M E Y L E N P K K Y I P G T K M I F V G I K K K E E R A D L I A Y L K K A T N E					
<u>Rhesus monkey</u>	N K N K G I T W G E D T L M E Y L E N P K K Y I P G T K M I F V G I K K K E E R A D L I A Y L K K A T N E					
<u>Horse</u>	N K N K G I T W K E E T L M E Y L E N P K K Y I P G T K M I F A G I K K K T E R E D L I A Y L K K A T N E					
<u>Pig, cow, sheep</u>	N K N K G I T W G E E T L M E Y L E N P K K Y I P G T K M I F A G I K K K G E R E D L I A Y L K K A T N E					
<u>Dog</u>	N K N K G I T W G E E T L M E Y L E N P K K Y I P G T K M I F A G I K K K T G E R A D L I A Y L K K A T K E					
<u>Gray whale</u>	N K N K G I T W G E E T L M E Y L E N P K K Y I P G T K M I F A G I K K K G E R A D L I A Y L K K A T N E					
<u>Rabbit</u>	N K N K G I T W G E D T L M E Y L E N P K K Y I P G T K M I F A G I K K K D E R A D L I A Y L K K A T N E					
<u>Kangaroo</u>	N K N K G I I W G E D T L M E Y L E N P K K Y I P G T K M I F A G I K K K G E R A D L I A Y L K K A T N E					
<u>Chicken, Turkey</u> ...	N K N K G I T W G E D T L M E Y L E N P K K Y I P G T K M I F A G I K K K S E R V D L I A Y L K D A T S K					
<u>Penguin</u>	N K N K G I T W G E D T L M E Y L E N P K K Y I P G T K M I F A G I K K K S E R A D L I A Y L K D A T S K					
<u>Pekin duck</u>	N K N K G I T W G E D T L M E Y L E N P K K Y I P G T K M I F A G I K K K S E R A D L I A Y L K D A T A K					
<u>Snapping turtle</u> ...	N K N K G I T W G E E T L M E Y L E N P K K Y I P G T K M I F A G I K K K A E R A D L I A Y L K D A T S K					
<u>Bullfrog</u>	N K N K G I T W G E D T L M E Y L E N P K K Y I P G T K M I F A G I K K K G E R Q D L I A Y L K S A C S K					
<u>Tuna</u>	N K S K G I V W N N D T L M E Y L E N P K K Y I P G T K M I F A G I K K K G E R Q D L V A Y L K S A T S -					
<u>Screwworm fly</u>	N K A K G I T W Q D D T L F E Y L E N P K K Y I P G T K M I F A G L K K P N E R G D L I A Y L K S A T K -					
<u>Silkworm moth</u>	N K A K G I T W G D D T L F E Y L E N P K K Y I P G T K M V F A G L K K A N E R A D L I A Y L K E S T K -					
<u>Wheat</u>	N K N K A V E W E E N T L Y D Y L L N P K K Y I P G T K M V F P G L K K P Q D R A D L I A Y L K K A T S S					
<u>Fungus 1 (Neurospora)</u>	N K Q K G I T W D E N T L F E Y L E N P K K Y I P G T K M A F G G L K K D K D R N D I I T F M K E A T A -					
<u>Fungus 2 (bkr's yeast)</u>	N I K K N V L W D E N N M S E Y L T N P K K Y I P G T K M A F G G L K K E K D R N D L I T Y L K K A C E -					
<u>Fungus 3 (Candida)</u>	N K R A G V E W A E P T M S D Y L E N P K K Y I P G T K M A F G G L K K A K D R N D L V T Y M L E A S K -					

Symbols in light blue or gray represent amino acids which show NO differences in any organism on the list, so you can ignore them.

(adapted from Strahler, Arthur, *Science & Earth History*, 1987, p. 348)

AMINO ACID SYMBOLS	
A	= Alanine
C	= Cysteine
D	= Aspartic acid
E	= Glutamic acid
F	= Phenylalanine
G	= Glycine
H	= Histidine
I	= Isoleucine
K	= Lysine
L	= Leucine
M	= Methionine
N	= Asparagine
P	= Proline
Q	= Glutamine
R	= Arginine
S	= Serine
T	= Threonine
V	= Valine
W	= Tryptophan
Y	= Tyrosine