

BLD10/CEP135 Conserved Region 2

10 20 30 40 50 60 70 80 90 100 110 120
 10 residues *T.thermophila* 18 residues *T.thermophila*

T.vaginialis (456-758) Q I L A E K D G I D S L K K Q I K Q A E A K S A E L L L T Q T Q Q K G Q Q N D A T S E K I E T L T L Q L D E L C A K Y D T E L L I E D K D K K I K Q L E L L E Q L S S D K N N T T S A P V S C P E G A
T.thermophila (2807-3242) A E N S N F K I K I S L L E E N K S L Q E K V A H L K T T K E T I E E N Q M I K D R L I E N K L I Q E M K K I I D T Y D K E K E A I L R E T H Q I N E K L E E I K A Y T L E I E K F R D L V L T K K Q L M E E K N
B.dendrobatis (813-1157) M D H E K D Q F V I R D I K S L S Q T E A T I T S L L L N G E L Q L R L E R V T E K L L A D Q M K I A D I D Q E R D G F L L Q S D L K K A E L I M T L T G Q L H R I N D A V L M T T E L V D A R E
C.reinhardtii (875-1219) A D V C E Y M A N L K A M S T D L R A E A M R A A D L L A G E A A A A Q D A A A S A E A Q L R G L L R M D A D R D N L L Q H E L D A K A E R L V A Q E Q L A G C A A E Q E A A R L L A L A E G
D.melanogaster (625-958) R I I A D Y Q S K L L Y A E R Q R S A D V R A S T L L L D S S R E N S R S E V T Q L R M L G A L R Q T Y I S L E H E K D T L L H O L D T K T E R V Y K L E Y L K D C K E K R N L E Q N V K D L E D
H.sapiens (678-1022) R S V D Y Q H R L S I K R G F L E S A Q A Q I K I L L E E F K I D E L N L K M T S Q D E A F H V M K K T I Q V I D K E K D F L L Q E T V D E K T E K I A N L Q E N L A N K E K A V A Q M K I M I S E G E S

25 residues *T.thermophila*
 183 193 203 213 223 233 243 253 263
T.vaginialis (456-758) R L R Q Q I Q D L L K S S M Q N S L S E Q E K N E L Q S L R L R S Q O L E L I R S S E E S M D N A T L N Q E L L N A K A K I T Q M E Q K Y E E L K Q L A V K L Q E L N K A K E D L E S E K I S N T V P D L R Q K F
T.thermophila (2807-3242) R A D Y F Q D G F K R S Q O Q K I H F L N E I E D L K N K N I A V T D K L D Q M A V N D N L T E V L K E K S Q E I Q E L L I E K D K L L Y E R E Q E Q I Q L E R I Q N N L H Q L E E F E R N F L K E T Q D V Y E L K E V Y
B.dendrobatis (813-1157) Q L O T T L Q N L N Q D R E L N S L Q R L E Q T G Q E R D Y F Q N M T Q R H V D E A R N L G S D L A A V T R E N Q V L N A E L V E A S T E R D R Y K A D V T E C D R Q L R Y L D E L I R G K D O E K D Q L M V S Y R K L
C.reinhardtii (875-1219) R L A L D N R A R E G E A A A V R A Q L A A L D S V R A L S G E G E A L R E E L R A V S E D L E A L V R E N Q V V G G E L A A V A A Q R D S A A E A E A R R L G G R L A S A E Q L R A K E A E A E D L R V Y E A L
D.melanogaster (625-958) Q L R K L A N R R R D R S E L T E T S T E S K T L R Q Q I V A L K A S R D E A I E A N R R L M D K L S D A Q V E A R T L Q K K L T D S E L Q V A N M K Q O L H K Y V Q E V K A E D L L I Q K E K E R D M L D O Y H C L
H.sapiens (678-1022) S V N Q L K E T L V N D R R E I N S L R R Q L D A A H K E L D E V G R S R E I A F K E N R R L Q D D L A T M A R E N Q E I S L E L A A V Q E K E E M K S R V H K Y I E V S R W E S L M A A K E K E N Q D L L D R F Q M L

283 293 303 313 323 333 343 353 363 373
T.vaginialis (456-758) R L L E R M K V E H F A T V E E L N Q K N I T L Q S L S D K L E S Q K L T R D F Q E L Q L K R E G A N N A R E L L E T L L H R S K S E E V Q R L A A
T.thermophila (2807-3242) S H Q E T N R Y K Q I E D L K L Q I Q Q K E F E T N E Q F Q K N L N Q L E S Q O E I Q L K D Q I N K L N Y Q I S Q I Q S E D R L K I Q E R V H F D S T L L E L Q K I N E D N Q I E I A N L K D K L L K L E N Q R D K L
B.dendrobatis (813-1157) L M E I R A A C O V R L Q E R H R E L Q R Q V A S L S Q V A I G R A L E D S I N S A A S L V S K M E I H A R A S R V R F E R C F E D E R H V Y I L M E M C S K T L W L V K R G O M E T H A A C V R E A L
C.reinhardtii (875-1219) A L A E H R R L Q G G V G A L E R E G A M R E A A L Q A K A A V S S L A E S Q R A A G A T I N Q Y V M D L Q A F E R Q V D S L S R Q L S Q A E A D G E E L V R Q R A L
D.melanogaster (625-958) T L G Q A T L E G N N Q S L E C E A V E F R R Q I C E L C E V H S L K E Q L Q R Q L C A L H D M E V Q L T A A R A S V R C L E R E L N A D D I R V Q
H.sapiens (678-1022) H L R A E D W E V K A H Q A G E S S V L R E L L S I D T E R R L R E R V L E K E T Q E H I N A H A Y E S Q I S S M A K A M S R L E E L R H Q E D E K A T V

393 403 413 423 433
T.vaginialis (456-758) D K I V N A G K E M N L L A A A N H Y K M T I Q
T.thermophila (2807-3242) Q R Q L S E E K E N D L K F R K S E Q N V E N D I A S L D T Y K R L L D E F Y K L S E S Y E H K K Q
B.dendrobatis (813-1157) N R D I A A R D I T H T F E R Q S M E M Q A Q L A T T L E N D R L M R T I E R M N S E S A L V S
C.reinhardtii (875-1219) L E E I R A A C O V R L Q E R H R E L Q R Q V A S L S Q V A I G R A L E D S I N S A A S L V S
D.melanogaster (625-958) K V D L A R K E L C D K L D V E R S K L N A E L N D V N E I R K K L E K Q C E K L R D E L Q Q
H.sapiens (678-1022) L N D L S S L R E L C I K L D S G K I M T Q L N K N L E F E R V V V E L E N V K S E S D L L K K

D

PLK1

Kinase Domain

10 20 30 40 50 60 70 80 90 100
T.vaginialis (24-280) Y T I K D M S G G F A T V Y S G E E M P G R L P V A I K C T S Q T R V A D P K V R R K I S E V D I H K S L H G Q I V E F K G V F Q D E N Y V Y I L L E L C P N G T V L D M L K K N N P F S E K Q T S Q I C Y G L L
E.cuniculi (40-294) Y M L K K L G R G A Y A Q Q Y L A E I E S G E Q Y A M K V V R L K D I K S R K V H K L E S E I A I H S K L D N P N V V K M R S F R S S E Y V F M V L E C E R G A L D A L K R N G K L K E R H V A R F V K G T V
S.pombe (41-295) Y T R Y D C I G E G G F A R C F R V K D N Y G N I Y A A K V I A K R S L Q N D K T K L K L F G E I K V H Q S M S H P N I V G F I D C F E D S T N I Y L I L E L C E H K S L M E L L R K R K Q L T E P E R Y L M M Q I L
B.dendrobatis (44-258) Y T V G A L L G E G G F A R C Y E V L D D K E N R F A A K V V Y K P S L K S K O R Q K I S E T F V D M I K R K R L D P E I R Y Y M Q L L
N.gruberi (90-343) Y Q E R F L G K G G A Q C Y L F R Q V G T I F H A A K I D K K T L E K E N V K O K L F S E I K I H S L S H R I V N F V R Y F E D I N N V Y I L L E V C N C G S M M D L K S R T L T Q E A R F F H Q I L
O.tauri (52-330) Y V R G R L L G R G G F A A V F A V R E M S T G R E L A K S T L K P R Q W K M T E I D I H A R A S R V R F E R C F E D E R H V Y I L M E M C S K T L W L V K R G O M E T H A A C V R E A L
C.reinhardtii (1-251) G R L L G G G F A A V E V E R A S D G S R M A A K V L P S S L A D A M K L H R V Q N E D I N Q L Q H P H V V T L G S F Q D D Q N V Y L Q E L C C E V P G E L L R R V R F S L E Q A A H I M Q V L
T.cruzi (48-301) F R C G R L L G R G G F A K C Y E V E R D G E S Y A L K V I D R S I L Q K T K L O K L H S E I S I H R R M K H N I V N F I R T F Q D D V N V Y L L E K C S N Q T L M E I S K R R T R F V P E T Q H I M L Q A L
D.discoidium (163-415) Y R Q E F L G K G G F A K C Y L M T E V E T N R I Y A A K I P K S T L Q K T R A R S K L K S E I K I H S L S H E N I V K F H C F E N E E N V Y I L L E L C N Q K T V M D I H K R R K Y L M E Y E T K Y Y V G V I
M.brevicollis (48-303) Y I R G S F L G K G G A Q C Y L T D S M T K R V Y A G K I V A K S L S K H R A K E L K S E I Q H R S L T H K Y I V G H S Y F E D E H N V Y I L L E I C S N Q S M M E L H K R R R G M S E I E A R W L L Q I V
C.elegans (38-288) Y E K G R F L G K G G F A H C Y E L T N R A T R E V A G K V P K S M L V K O Y Q R D K V D N E R I I H R E L G H I N I V K L F N F F E D N L N V Y I T L E L C A R R S L M E L H K R R K A V T E P E A R Y F T H O I V
D.melanogaster (25-276) Y K R R L L G R G G F A K C Y E I D V E T D V F A G K I V S K K L M I K H N Q K E A T A E I T I H R S L N H P N I V K F H N Y F E D S Q N I V I V L E L C K R S M M E L H K R R K S I T E F E C R Y I Y Q I I
H.sapiens (53-304) Y V R G R F L G K G G F A K C F E I S D A D T K E V F A G K I V P K S L L K P H R E K S M S E I S I H R S L A H Q H V V G F H O F F E D N D F V F V L E L C R R R S L E L H K R R K A L T E P E A R Y L R Q I V
C.marulae (118-372) Y I R G L K L G K G G F A K C Y E V T L D N T K E Y A I K I V P K A N L V K S R A R Q K T E I Q I H R T L K H A N I C E Y K H F F E D K T N C Y I L L E L C H N G S M M E I K R R K S L T E E A R Y M Q I I
T.pseudonana (8-264) Y L R G K L L G K G G F A K C Y E V T L E T K K I I A A K I P K Q T L T K N R A R Q K I S E I K I H S L N H Q H V A E H E V F E D H E N V Y I L L E T Q N H T N E L I K R R K R L T E E A R Y V V G I I
T.thermophila (30-284) Y L R G K L L G K G G F A K C Y E V T L E T K K I I A A K I P K Q T L T K N R A R Q K I S E I K I H S L N H Q H V A E H E V F E D H E N V Y I L L E T Q N H T N E L I K R R K R L T E E A R Y V V G I I

120 130 140 150 160 170 180 190 200 210 220 230
 22 residues *O.tauri*
T.vaginialis (24-280) N A L I Y L H E H R V I H R D L K L G N L L D K N H M K L A D F G L S A Q L S D D E K M T L C G T P S Y L S P E V V G G G K R L G H T T S V D I W A T G V C S F L M T G K Q P F G S D K K I T Y K N I S
E.cuniculi (40-294) E G L I Y L H N S V S V H R D L K L G N L F L D S K N V K I G D F G L S A V I K D G E K R V T M C G T P N Y I A P E V L F L G K A S G H S F E A D I W S L G V I I Y T L L V G P P F Q K N V E D I Y K M I K
S.pombe (41-295) G A L K Y M H K K R V I H R D L K L G N L M L D E S N N V K I G D F G L A A L L M D D E R K E M T C G T P N Y I A P E I L F L N S K E G H S F E V D I W S A G V W Y A L L I G K P P F Q K C V K T I Y R K I K
B.dendrobatis (44-258) D S I R Y M H R H G V I H R D I K L G N L F L Q B R N D M K I G D F G L A A L K H D G E R K T I C G T P N Y I A P E V L N L K E G H S F E V D I W S L G V I M V F A I G K P P F Q K D V A S I Y E R I R
N.gruberi (90-343) L A C L Y M N E K K V I H R D L K L G N L F L T D K M E I K I G D F G L A E V F D G E R K K T C G T P N Y I A P E I L Y L N K G H S F E V D I W S L G V I Y T L L V G T P P F E T K D V K E T Y K I K
O.tauri (52-330) T A T A H L S I R I H R D L K L G N L F L T O E R L K I G D F G L A C V L E H R G R K T I C G T P N Y I A P E V L R G L K D G V H S Y E V D T W S L G V I Y T L L V G T P P F Q K D V L T Y K R I R
C.reinhardtii (1-251) A A L E H L H S C G V L H R D L K L S N M L G R D T V K V G D L G A C H L P S P A A R N H S T G S L N M A P E V L R L P P A G Y G M E V D V M L G V L Y T L L V G R P P F A E R R G D A A G D
T.cruzi (48-301) A A I H Y M H Q D C V I H R D L K L G N M M D A E N N V K I G D F G L A E L Q Y D G E R K T I C G T P N Y I A P E I I D L S A H E G H S Y E V D I W S L G V I Y T L L V G P P F Q S D V K A T Y R R I K
D.discoidium (163-415) M A V Q Y L H N N N I I H R D L K L G N L F I D N N R I K I G D F G L S T K V E H G E R K K T I C G T P N Y I A P E I L D N S N G H S Y E V D V S I G I I Y T L L I G K P P F E T S D V K A T Y R R I K
M.brevicollis (48-303) E A T A H M H A R R V I H R D L K L G N L F L N E E M V K V G D F L A T A L T H D G E R K K T C G T P N Y I A P E I L E L G K S G H S F E V D I W S I G C L I Y T M I V G R P P F E T R D I K T T Y S K I K
C.elegans (38-288) D G V L Y L H D L N I I H R D M K L G N L F L N D L V K I G D F G L A T T V N G D E R K K T C G T P N Y I A P E V L N K A G H S F E V D I W A V G C L Y I L L G O P P F E S K S L E E T Y S R I R
D.melanogaster (25-276) Q G V Y L H D N R I I H R D L K L G N L F I N D L H V K I G D F G L A T R I E Y E G E R K K T C G T P N Y I A P E I L T L K K G H S F E V D I W S I G C V M Y T L V G O P P F E T K L D T Y S K I K
H.sapiens (53-304) L G C Q Y L H R N R V I H R D L K L G N L F L N D L E V K I G D F G L A T K V E Y D G E R K K T C G T P N Y I A P E V L S K K G H S F E V D V S I G C I M Y T L L V G K P P F E T S C L K E T Y L R I K
C.marulae (118-372) E A V E Y M H R N R V I H R D I K L G N L F L T S D L Q I K I G D F G L A A K L E Y D N E R K T C M G T P N Y I A P E I L C G L K N G H S Y E V D I W S L G V L Y T M I G K P P F E T A D V K T Y K R I K
T.pseudonana (8-264) D A V S F M H E V N V I H R D L K L G N L F L N K H V N I K I G D F G L A T R L E S A E K R K T C G T P N Y I A P E I N G D K E K R G H S F E V D T W S M G I C Y M I V G K P P Y E S S D V K S T Y K R I K
T.thermophila (30-284) N A L K Y L H S H K V I H R D L K L G N L F L N E K M E I K I G D F G L A T K L E F D G E K H T I C G T P N Y I A P E I L D G L K T G H S Y Q V D I W S L G V I Y T L L I G K P P F E T P D V K T Y K R I R

252 262 272 282
T.vaginialis (24-280) H V S Y Q W P E K S H V S D L A K D F V D H L A K D P N A R P T A K E L I T H P F
E.cuniculi (40-294) L N N Y I F P E N C D L S S E A I D L I T Q I L N T N P L E R P T L E H I L S H K F
S.pombe (41-295) A N S Y S F P S N V D I S A E A K D L I S S L L T H D P S I R P S I D D I V D H E F
B.dendrobatis (44-258) E N N L E F P A N I P I S D D V R V I K S L L H S D P E Q R P S I D D V L E H R F
N.gruberi (90-343) H N D Y N P P P D I E I S S K A K S I R S I L R R N P D D R P O I K T I L S D P F
O.tauri (52-330) E N D Y F P E P L V S D S T K A L I R A A L H P E P S K R P S L A Q F A A H P F
C.reinhardtii (1-251) P G F Y E F P E D V A L S E S A R G L V H A L L V V D P S O R P S L E Q V R Q H A F
T.cruzi (48-301) Q C R Y E F P R L D I P E S G K E L I H R I L Q S R P D H R P T L V E I R T H P F
D.discoidium (163-415) Q N Q Y S F P D E P I I S H Y G K S L I S I L N P V P E Q R P N L T Q I L E H D F
M.brevicollis (48-303) R N D Y S E P S T L Q I S P E A V D L I R M L H R D P K C R P N C E E I M R H P F
C.elegans (38-288) H N N Y T I P S L I A T Q P A A S L I R K M L D P E P T R R P T A Q V O R D G F
D.melanogaster (25-276) K C E Y R V P S L Y L R K P A A D M V I A M L Q P N P E S R P A I G Q L L N F E F
H.sapiens (53-304) K N E Y S I P K L I N P V A A S L I Q K M L Q D P T A R P T I N E L L N D E F
C.marulae (118-372) A N I Y T F P S Q V Q I S R P A R D L I V S I L N A A P E O R P Q L S D I W C S E F
T.pseudonana (8-264) A N E Y B F P Q G K V S N D A R T L I S M L Q T D P K L R P T L G E L R G H P F
T.thermophila (30-284) N I S Y G F F E N V P I S D Q A R G L I T R I L N I D P Q R R P T L D E L M S S S

Polo Box 1

10 20 30 40 50 60 70 80 90 100
T.vignalis (343-420) YRIWV--DYSRHYGLAYMLHNIHICGACFNDSRRILSPDGT--FCQY-----WASP-----QTPAPEIYEM---ST---IEVSPIRKLLLIQHFAVE
E.cuniculi (324-405) VLFSEI--PVTKLRGVGYLVKSGVYIYFSDHRLMLKPNRK--SVIY-----LNST--IESGKRVFYKEHLVEK-----IPA-EIAESYKGLQYFIRI
S.zomba (494-572) TKKW--DYSNKYGLGYQLSDSEVGVHFNDDTSLLFSADEE--VVEY-----ALHP-----KDTEIKPYIYPA--SK--VPE-SIRSKLQLLKHFKSY
B.dendrobatidis (526-607) TKWI--DYSNKYGLGYQLSDSGVGVYFNDSITLSDGF--HFEY-----LYTS--KSTEKISMCGAVNL---DS--FPT-DLTKKVTLLKHFKGY
N.gruberi (607-688) THWA--DFSAYKGLTYLMSGNGVAVYNDSSKMTYMPATE--QINY-----YERK--ATGDNIEEERSTFTV--SD--FPP-QMNKVTLLKYFADV
O.tauri (452-560) VDSIKWEYTRDYGMPYQLSDGTGVYFNDDSSMVFMTDADSPVYVTPANERESSTRDGDGNSGETKRAVRIIGRTIINPDDARSMYGR-AVAKKVTLLAMHFAV
T.cruzi (506-595) YDTYA--DFSAYKGLCYRLSTSHTVGHFNDSKMWVEPITG--RVEY-----YARVKEVYSHN--NAGVMHARDQQAHEM---ET--FPE-SLNKVTLLKYFKSY
D. discoideum (697-777) ISQYA--DFTNKYGLAYVLSNSYVGYAFNDSTKIVLIESE--IAYY-----MEHA--KG--TDGGRRVNLV---TQ-Q-HPH-DTKKVTLLKYFLNH
M.brevicollis (174-551) VTKW--DYSYKGLGYQLSDSIVGVLFNDNTKMWLSDSLH--HVEF-----TNRE-----RKGGATTAMTL--DS--FPD-DMTKIALIKYFRDY
C.elegans (414-480) ISKW--DYSYKGLGYQLSDSIVGVLFNDNSRMLDQAGN--ELTY-----IEKS-----NKEHYFSM--HSGE-MFG-LLNKVTLLKYFRSY
D.melanogaster (592-486) ISKW--DYSYKGLGYQLSDSIVGVLFNDNTKLLPNQI--NVHF-----IDKD-----GKETYMTT--TD--YCK-SLDKMKLLSYFRKY
H.sapiens (411-486) VSKW--DYSYKGLGYQLSDSIVGVLFNDSTRLIYNDGD--SLQY-----IERD-----GTESYLTV--SS--HPN-SLMKKITLLKYFRNY
C.meridae (672-755) ICKW--DYSYKGLGYQLSDSIVGVLFNDNTKMLHAGGDASAIEY--VERK--RLAFGSYDQWQIFTW--ND--HRE-SLRKVTLLRHFQSH
T.pseudonana (364-444) VTRYV--DYTSYKGLGFLINDGSGVYFNDSKAVISSDD--KFVY-----VERR--KE--GNTPEVANYTL--TD--YPESSLKVKVTLLQHFQSH
T.thermophila (460-539) YTQW--DYSYKGLGYLNSGSGVYFNDSKTVLDPDTN--NIEY-----IERL--GN--ERQDFVQDFTL--KD--YPP-EMKKVTLLSHFKSY

Polo Box 2

10 20 30 40 50 60 70 80
T.vignalis (444-523) HVKYWARTRDGFLFRMANRNIQANFR-DHTKLVIESNSRNLFY-DTGRGVQQLTLDGLD--RERYHEVR-KRFVIVKEMAKELV----
E.cuniculi (419-488) FIVKIRKIEGCLFVMASTIVFDFY-DGVRVLSRCGERSYCYNGLGLAS-----FNQIEGRGCEILRGCLGCG-----
S.zomba (599-682) FMHYLRTROAI MFRSLNGIFQFNFL-DHRKVIYSTARKIIVLDRKREVELPQEAASA-----FSEDLR-SRLKYI RETLESWASKMEV
B.dendrobatidis (631-671) YLTKLRTKNGVFRSLSNHTLQGNAY-SFAELVFKTWF TCGD-----DTEIILTDGNSLVSYTPDQGVRTYALNKVKS--PSQEIA-KRLKYTKDVLQQLIS--
N.gruberi (729-809) FVKRWLRTSHAVIFRLSNKIVQVCFH-DQTEIILTDGNSLVSYTPDQGVRTYALNKVKS--PSQEIA-KRLKYTKDVLQQLIS--
O.tauri (586-678) YVKHRTQSSKGI SURLSNKIQTNFE-DGTEMLISTTYRLLVVRNDRPGEQTVHSLDADN--ATFPOPLV-DG-KHVQRILPALCTE---
T.cruzi (633-718) YLKRMLLTPHAMIFRLSNKIQVCFH-DKAEVILSSESRVVTYDASGRITVPLYSATS--HSNEIA-SRLRYTKDILCELQNKREL
D. discoideum (626-908) YVKKWIKFDNCAIFRLSDKIQVNYL-DKSRIVYSSK-DWVTFVYPRQIITGLTYF--KNGDKKIS-EKIKYIGTLLSNLNSKPP
M.brevicollis (175-558) FVKKWLRTKHAIVFRLNIGIVQVNF-DHTKVVVNGPRDVFVIFDTEGETRVYTLDEISRSKHASIDVLV-ARLSYATDVINHMLS--
D.melanogaster (491-578) TLRVWFRTKSAIVLHLSNGTVQINFFNDHVKMMCPQLQAVTFIDQNKRM TYKLNLR--NGGPEKFL-HRLKYAKTMIERLMSDANV
C.elegans (515-601) HLHSWFRITCAVVMHLTNGSVQLNFS-DHMKMLCPRMSAIYMDQENFRTYRFTSIVE--NGVSKDLY-QKIRYAEKLRKMLKEMFT
D.melanogaster (491-578) YLRTWFRTKSAIVLHLSNGTVQINFFNDHTKLICLPLMAAVTYIDEKRFRTYRLLSLEE--YGCCKELA-SRLRYARTMVDKLLS--
H.sapiens (510-592) YLKRWRTRHAMIFRLSNRIVQVDFH-DTQLVLSAGHIVTYRDKLRRILQLRLHAPN--PEPLV-KRLRYLRLDILGHLTQD--
C.meridae (788-887) YMKWIKRTKHAMIFRLSNRIVQVDFH-DLFEVLSSEGLITFVDEKKNRFVHSIEDIANKQGS--DVS-RRLKYSKEITLQLI--
T.pseudonana (478-557) YVKKWIKRTKHAIVFRLSNKIVQVDFH-DKTEVILSSEKMTIVYDKRGTRTDYPLSTALESSNT--EMS-KRLKYTKDILTHML--
T.thermophila (585-644) YVKKWIKRTKHAIVFRLSNKIVQVDFH-DKTEVILSSEKMTIVYDKRGTRTDYPLSTALESSNT--EMS-KRLKYTKDILTHML--

E

SAK/PLK4

Kinase Domain

10 20 30 40 50 60 70 80 90 100
M.brevicollis (45-274) LIRKHLRSLQDLQDRVQVEVGHTRLRHEHIVRLIDFGEEDDHIALLVLEYAGGSLTHYLQNLKR-PLTEPEGRFLIVQLLDALEYLHRHGIHRDLSPSNILLTTDLQV
B.dendrobatidis (1-223) MIDKGLMKAAGMTRRVANVEVHQLHSPSILELNYFEDAKCVYLIMFCKNGELFAYIHKRPHFVLESEARGILMQLVRGLQYMHNSNIIHRDLKSNLLTHTFDL
D.melanogaster (44-265) MIDKGLMKAAGMTRRVANVEVHQLHSPSILELNYFEDAKCVYLIMFCKNGELFAYIHKRPHFVLESEARGILMQLVRGLQYMHNSNIIHRDLKSNLLTHTFDL
H.sapiens (42-263) MIDKGLMKAAGMTRRVANVEVHQLHSPSILELNYFEDAKCVYLIMFCKNGELFAYIHKRPHFVLESEARGILMQLVRGLQYMHNSNIIHRDLKSNLLTHTFDL

120 130 140 150 160 170 180 190 200 210
M.brevicollis (45-274) KLADFGMAKVVGGAAYPESSLNLTLCGTPSFLAPEMIQKRHHGLSDVFSLGAFAFFLLTGSAPFDVQAHNALKATLAKVAQVEYTMPGSLSSAQQDFRQCLQANPEYR
B.dendrobatidis (1-223) KLADFGLATRL--DNRDGE-QKTCGTPNYISPEIVSRHSYGLQETDLWFGDMIVTILTGAPPFOS--GAVKSTLDKASRLLEYLSPNIFSEARDLDKLLQLDPKOR
D.melanogaster (44-265) KLADFGLATRL--DNRDGE-QKTCGTPNYISPEIVSRHSYGLQETDLWFGDMIVTILTGAPPFOS--GAVKSTLDKASRLLEYLSPNIFSEARDLDKLLQLDPKOR
H.sapiens (42-263) KLADFGLATRL--DNRDGE-QKTCGTPNYISPEIVSRHSYGLQETDLWFGDMIVTILTGAPPFOS--GAVKSTLDKASRLLEYLSPNIFSEARDLDKLLQLDPKOR

M.brevicollis (45-274) PTVADLRQHD
B.dendrobatidis (1-223) ISLSQVLQHP
D.melanogaster (44-265) ITLEAVLCHP
H.sapiens (42-263) LLSLSVLDHP

Conserved Region 1

21 residues *H.sapiens* 41 23 residues *H.sapiens* 17 residues *H.sapiens*
10 20 30 40 50 60 70 80 90 100
M.brevicollis (286-434) AEASAPRTRHVAATQDHVAPTLGAQSRHNTSVGSSSHASQAPWIYAHPKIID--PAEEDGSHNQAGATAARRSLTFGSSSHR--GMQVPA TSA
B.dendrobatidis (225-311) FEIIGKPIVA--SANVNLPRKPD--SLVERDPKII--PIDDGTLANNFSTP--
D.melanogaster (274-375) GHSAPGALNVFSQMSGDSGIIITFASDD--SRNSQIIRSVENSGPQQVIL--
H.sapiens (283-569) SIDSGHATISLIGQPLPKMTVFPKNSSTDFRVIDQAEESTSNSSQAKTYTMRCHSAEMLSVKRSRGGNEERYSPDNNANINFKKEKTSSSSGSFERDNN--

181 234 244 282
M.brevicollis (286-434) HYGSNHSRPRSSRGGSSSDRASSGNPAMGSAHSTSLDAG--ARESIMSSLRSLSHLQSL
B.dendrobatidis (225-311) --VAHQGDHNRIL--PINSRLSHAIPNV--KPKPKISSATSSITQPN--
D.melanogaster (274-375) PQIREFKQVHKL--PYEQTLFQASTGL--AEPNIPGAAKSFAFCMEA--GNVPNS
H.sapiens (283-569) QALSNHLGRGKTF--PFADPFGQHDLDKDTSKNAWDTSKPEIIGQECVFSQDLS

Cryptic Polo Box

10 20 30 40 50 60 70 80 90 100
M.brevicollis (455-642) VRLRPFRRHAGKSYVELTAGRHILELAHER-----LVF--DQADAQVQRH--TAHQGVQTVLDTCPPTIASKVVAVRRLVDIVSKTSP
B.dendrobatidis (316-579) TDRLNPMRQITKHGQVEILPTRKILLNF--S-GDQV--TMIISGNSETISLY--PRSTYHVDNS--MOP--ARQYSRSLPTSLLKKFRYARFVELVRAKTP
D.melanogaster (391-608) TKRLLPTRYTKNAIMSLRNGEVLEFLKFRPTYNEDRIINDICRISDDGQRITIIYQDPGRGLPVREQPPDLQIPSGDGVYNDLPSKHKKYIYGARFVGLVSKTIP
H.sapiens (596-834) AHRLLKPIRQKTKAVVSLDSEEVVELVKEYA--SQEVVKEVLQISSDGNITIIYYPNGRGLPFLADRP--SPTDNIISRYSDNLEPKYWRKYQASRFVLRVRSKIP

120 130 140 150 160 170 180 190 200 210
M.brevicollis (455-642) KVVYVSPHGKMLMENNHD-RDVFREFYASARRVFT--RER--DL--VLPDSSHVEFAK--HQQLGDAL--AAVERVLPEARADEALFRLRHWTRSLGENVEG
B.dendrobatidis (316-579) KIIIFYSQAKDILMENGQIPDFEMIFYSQVRYHTSVSKOTLIRVPPKPPVSPQVLAISTKTPHDFYVQKVDL SRPDDISLPDLQ--SIFKACQELRQOLDIDR
D.melanogaster (391-608) KVTYFSTLGGKQLMETM--TFPEIRY--SGAKLLKTPSEG--LVK--YDRNSMLSDYS--CBESR--SLIEGNEGFTHGVNIN
H.sapiens (596-834) KIIYFTRYAKCILMNSPGADEFVWEY-DGVKIHKT-EDF--IQG--IEKTKSYYLTKS--ESEVNSLKEEIK--MYMDHANEGRHICLALLES

230 240 272 282
M.brevicollis (455-642) --QQEQVACEVLR--
B.dendrobatidis (316-579) S--GKFKHTRFPIILKSTSHSIHPSQSAFAYSTPGRSVNQNQSKHG
D.melanogaster (391-608) AL--EVAQTKDNSCFVYIIGRPIITDQV--
H.sapiens (596-834) IIEEERKTSAPFPPIIGRKPSTSSPKALSPPPS-VDSNYPTREASR

Polo Box

10 20 30 40 50 60 70 80 90
M.brevicollis (648-658) -----ATMLKLPKPNY-----
B.dendrobatidis (633-729) CNATKCRSHRVLSSASDSGIISSSRPHPLTAALESKSESTQENMIGSSSSAAGTYGTPRPLVLDNIQWCFKQIKSSDLHRRVNEHTDHSASATSE
D.melanogaster (641-737) SDFGTNCRSRLMLAAHQNIPIKRIINVEPIGIAELSHGVVQVQFYDGSVSVIIPSMGGGITYTPNGSTHFHKGDDLFPFVRDRVGGQIPNQLK
H.sapiens (670-962) TDISNSLKDCLPKSAG--LKSQVFKVNWATQLTSGAVWQFNDGSLVQVAGV--SSISYTPNGQTRVGENEKLFDYIKQKQLCSLILML

F

SPD2/CEP192

SPD2/CEP192 Conserved Region 1

10 20 30 40 50 60 70 80 90 100

D.discoideum (844-1101) DSETEDFR I QYIP-QSGVYNLSI-PINATPTAD----ILNHEDLFYSYNNWDMGECNSNDTLTSLNLSKSGNGQKLYEINGEGFPEKLSNDQI SLKFNLPKQIYIN

C.elegans (323-444) AQPSPKDFRINTT-----RTRV-P I KPT SARHSGN-----

M.brevicollis (1142-1403) GPHQSASVQVTVAPDHAGAFRAYL-HLKAERVSRDGGPMPGSLIRLTRTLR-----AVAEPEIDVTPCGR--MDLGVLLPGELVCHQIQVRAAGRAQCTVAICVD

H.sapiens (841-1088) RPHATEEIKVLFIPSSPGVFRCTF-SVASWPCSTDAETIVQAEALASTVTLT-----AIAESPVIEVETEKKDVLDGDLTYGGKALPLKLINRTHATVPIRLIIN

D.melanogaster (516-639) TRVKEPSRRVR-----RTKISPRRAASPSDDGVRPLT-----

120 130 140 150 160 170 180 190 200 210 220

D.discoideum (844-1101) ANATIIDQLTGQKKLIKLSATITNNHH-NNNNIDNNNNNKSTPTISQKPLIIDPSPTQSPSTLLSQQKLEKTEKSKSFTPKFILLKELKLNDDSSISGSSDDNDNEDYEM

C.elegans (323-444) VVSSSTNDNTAAISS-----KDLTTSRKAMETFRQNASMADATNSNTASM

M.brevicollis (1142-1403) SPSSAPSPFFLCLPEPPAVATGSSGRGIEAAESAIVATVAPSSGASGPFGSALLAQCSTIYVCFRAVPGEHYSGSTAAYDEEFSRRLRVQLPAS-----YSKQIEFES

H.sapiens (841-1088) ANAVAWRCFTSKESVRAPVEVAPCADVTRLAGPSVVNHMMF-----ASYDGGDPEFLMIVLHSPKKQISSDDILDSAEFFSAKVDIEVDSP-----NPTPVLRS

D.melanogaster (516-639) CTEDENDEDEDKTF-----VNKKRVSIAIMGLIPRKAASSLSTRLOG

240 250 260 270

D.discoideum (844-1101) IDNNSRVPLSISNYVLE---NGIKLVYERKKIYPIETLSMYCNFNSY1101

C.elegans (323-444) TBI LSTI STARTDI SRRSRN-HGGGFBNTSVSTVIPANN-GNVL SHR 444

M.brevicollis (1142-1403) VSLVAASRPHLQVPRVMDAIVLAAAYSASHRRLPVRNASSIPARVDA

H.sapiens (841-1088) VSLRARAGIARIHAPRDLQTMHLAKVASSRKHQLPLKNAGNIEVYLDI

D.melanogaster (516-639) COVAVASSTERDFGISPNLAKNLSPLSSPRCLSSPLL DSTTSSDRRL

SPD2/CEP192 Conserved Region 2 (SPD2 Domain)

10 20 30 40 50 60 70 80 90 100

D.discoideum (1256-1519) LYNCRKVVNFGGVKLGDTSVLTITL-STLPHALHLNATFKQNDHSGSSSSNNSHFFSINGEQLLISPHSKTEVEIYTPLSISPHGSSVVVSSLNK-----QLSES

C.elegans (477-694) LRIRHAKRVAFGCYAVGETLRVEVEVE-NISDRQCLVRASTDSTIP-VYGI L D-----NKLTMVDPKKSIFKQVSPSSSVGRYQVIMSEVPAQ-----NFLHK

M.brevicollis (1617-1900) LLASESHVHFGAAPSDDL VORSLVLR-SLHHMIALRLRLKWRHGAESIVQAGSGGGLYNIITESITL RPOEDLVTLAFEPGERAVYRAGLSIOTL L D--DHFACRFVI

H.sapiens (1189-1418) ILSNKGFLAWGVP LGRQLQKLALRNNSASTTQHLRLLIRGQDQDQOLQNTFQSEGRLTSGNCEIRIHPKEDIFISVLFAPTRLSCMLARLEIKLGN-RGQGIKETI

D.melanogaster (700-943) LKVTHTTLTGWSTKLRDTRVRKSMQVK-NTADKRLVIRLGIQQP-----GFQLVGTD-----SSTITLQAMECRSVVNECPTVCGAII GALSFYAPPGAHNSNGPL E I

120 130 140 150 160 170 180 190 200

D.discoideum (1256-1519) PVLGYGSGAKMEVASSARNDSDID-----NTSCSNNNNNNIVLVNKNOSTDKGSVYCKFTVKNT-GQRSGFVRAISF-----YPSKSTIKPDRVSIQVGEQVD

C.elegans (477-694) PMWNGGIAKF-VPTSP-DLQOTI-----NCEYAMCTSCAKRI-----SEKISNSAGTRDGFAMIKVFDAMRQ-LPDGCVAFPPAPGFI-VYKKSQ

M.brevicollis (1617-1900) PLRGI GDLAHVQLVSAIDLHRTHTAACRL LHGDESPHRGSSMALLFHFDPDMVAV-DLVFRNN-GRRAFL--LGLQDQHGNTSTHGLNPEA-LV-VGAAR

H.sapiens (1189-1418) PLSYGGGTSLN-LIEGVKLSDSY-----MVTVNLVPGKESKI-----VFSVRNT-GSRAAFVAVKYGKDSKQKLDPKVLRIPDK-VY-LKERTC

D.melanogaster (700-943) PLYGYGSGASI-TINGLKGPVGA-----SFLTIGDVCESL SAGPLSA-----NLKFFHNK-GPLTAFVGISVDSTVLMKRL--SEAFVPRSR-LI-LLPNBE

230 240 250 260 270 280 290

D.discoideum (1256-1519) FRLEIHPN-----SSSGGSINNLSQLNGSLMNSTISPGKVKLYFGDEISRQRKISRSHNRL ENLKTDSM

C.elegans (477-694) KRVDIRID-----SSYIDLHDENNFRTSSSLSTASTTSFQRRIIP

M.brevicollis (1617-1900) HAMTVSLKVGELLAKALATAPMAHQOQSNLRDGSQSKPLFVGSLLLYTGETVLRSRVRHHMVRDREVDVEFNG

H.sapiens (1189-1418) ENVTLIYN-----PSDRGINKKTA-----TELSTVYLFGGDEISRQYRRL LHKPEMIKQILP

D.melanogaster (700-943) RCVQILFR-----PNREDLKNILKKTADV--LTLANMRI CGDEPNRQMRSLVQRMSRQREKLT

SPD2/CEP192 Conserved Region 3

31 residues *M.brevicollis*

51 61 71 81 91 101 111 121 131

D.discoideum (1559-1858) QINDSNQNNHNELDYDDVLEFFN-----NLSIKITPIIGNPPTKQNNINNNNNNNNNKMMNNNNNNNNNNNDI FSNLPPSKTKTT-----

C.elegans (724-823) QIIDGHDTI-----EVLRAVPVGFPAIKREDR-----

M.brevicollis (1959-2365) RPAESL AHRPKAAAPRRPRPVSGYELSPSTSPGVQETNPSTTATAPQASPAR---SDATVTLHDSMAEQAIAEPESELV-----CSTSETNFFVNTGSDLT YRL

H.sapiens (1486-1918) EFRDCIISR-ELCQPSKASLESTDLGASGKHGGVSLDVL PFKGQPSPLLS---RAARPPLDQMLASEEPWVLPPEHLILVAPSPQDMAKGRFQIVNRSVRLRFL EL

D.melanogaster (992-1146) DDESESS-LMFLPEADETVLFRT-----ICVANSPTTQSHLLEPVELLEADTTTL---TPVEQNWCVQPLLEFGVG--CSPLATLSV-----

151 161 171 181 191 201 211 221 231 241

D.discoideum (1559-1858) -----TSTTTTTTATPIINGRELFSEMELNNTPFKATINLPFPTNSVLENNATTSFNAAATNIPRSTASNNLNLKIKR-----

C.elegans (724-823) IYSNRGIRVRRDSATVEPGEQVAVRVPVLDGNI C PRRQ-----IFLVLDG-EQRDVTVDVIGDTSGDAATGDSGARDTAKLTPNATRAPHHEPTDALQFESPRSSM

M.brevicollis (1959-2365) CWPACHLTVTRQHGCVAPESKLIQILVSP-NSS-STKQSMFPVSGL--IYIHCCDDGQKIKVKQIREDLTQVELL---TRLTSKPFGLISPVSEPSVSHLVKPMKPP

H.sapiens (1486-1918) -----TNSFCSRQL-----LEVTDN-----

D.melanogaster (992-1146) -----

261 271 281 291 301 311 321 331 341 351 361 371

D.discoideum (1559-1858) Q-PSVY-----NNTNNNNNNNNENLNFNTFENTLRFNPTVTTTT--DGIKKSEEVH--YHIHQFEPDQPPPPQQRKQQQQQQQPQQQPKQH--TNGILFF

C.elegans (724-823) -----DLFAASYRSPFINFFTSTTE-----

M.brevicollis (1959-2365) G-PVTSIHWTPARKSRAILRQLHEFLALRLRFVSPNLSRLWLTSPAAALVFDGEGHARTVKAGVGPVFAVERHSGTIEPHATRHSVSVFGRDVGDTTFQWTLRY

H.sapiens (1486-1918) S-TKVEIRKNSITFPTTEPETSESCLELENHGTVDVKNLSSLAPPYVKGVDSEGDVFRATYAAFRCSPI SGLLESHGQKVSITLPRGRGDYADQWVDECTARGVYA

D.melanogaster (992-1146) V-P-----DLVRI SPSECVSPDGGHAEIDVR-----

459 469 479 489 499 509 519

D.discoideum (1559-1858) YDNKITFGIVQICQSTNKVVISNASNATLNVRLSLSPSPFELNHHITLNPXTTKVPIIFKPKIEIT-FSQS

C.elegans (724-823) -----FRAATSRKKKEICSNDDSTLLEITAFRNQTF-----VNDVTVPNTR-----FSNR

M.brevicollis (1959-2365) -----TACKISNETEDAVPLTFVAL-GTAFMLRHAQVTLRPMFVMLPVYDPRPAGTQEGHV

H.sapiens (1486-1918) PEDVYRFRPTSGVESRTLKVNLRNNSFI THSLKFLSP-REPEYVYKSHYSLRQAHYINMPYQFKPSAGK-FEAL

D.melanogaster (992-1146) -----LLRSRQDLERELIVVSM-----ENERISVPSFK-----F--

G

CP110

CP110 Conserved Region 1

10 20 30 40 50 60 70 80 90 100

D.melanogaster (554-659) ERQWAATRINAGVRGFLVRRLFATIEQVQRI VQTI RDTLIFVLNLHL ETCGHGLDAEEPANLRLKARLQQLCSASRTLHLIFFQTNIKDRMEIARDRQRIKTKLL

H.sapiens (794-910) EIQAKFNK I TAVAKGFLTRRLMQTDKLRQLRDTVKDTMEIRSFQSE-APLKRGISVAGQASLQERVLADLRALYGIHQIIFVMDAARMSILHHDRE-VRRKVA