

1 10 20 30 40 50 60 70  
 Algae P G Q T L N P Y S T D R C G T I L F L K R C T F S A A B M F A E A E N K Q I T W L I R V L G F V G M F V S V L L I L Q P V A N F I E B L I  
 mLUMA . M A A N Y S S T S S R K E H V K V T S E P Q P G F I E R L S E T S G . G M F V G L M T F L I S F Y L I F T N E G R A L K T A T S L A B C L S L

80 90 100 110 120 130  
 Algae P C G V G L F M A G M K C C V F P T V A F T I H F P S L I T I S L A W V V R P A I T A T P V A V A F G F L V Y G C R C . . . . . S  
 mLUMA S L V S P F D S I H S V A P E N E G R L V H I T G A L R T S K L S D P N Y G V R L P A V K L R R H V E M Y Q W V E T E E S S E Y T E D C Q

140 150 160 170  
 Algae R R K R N K Q A Q Q P Q T S S T H I L N V D L H I S Q C Q . . . . . Q A T E V L G . . . . . I E P  
 mLUMA V K K E T K S Y N T E R S E I V N S R N F R D I G H K N P S A M A V E S F T A T A P P V L G R P F F L S A G L I D K I D N F K A L S L

180 190  
 Algae R T K A P P V . . . . . I L Y P Y K P E W S K . . . . .  
 mLUMA A K L E D P R V D I I R R G D F F Y R S E N E K Y P E V G D V R V S P S Y A G L S S D D P D L G P A H V V T V I A R Q R G D Q L I P Y S T K

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

Algae . . . . .  
 mLUMA K A F A P C V A T S L I L L V A A G W L F Y R P L W A A L I G C L A L V P I I A R T R V P A K K L E

gi:31257214 *Phaeodactylum tricornutum*

1 10 20 30  
 arabidopsis . . . . . R D L V I T G L S S P L S M L P L S S P V T H A E D V K M S C B L K M  
 mLUMA M A A N Y S S T S S R K E H V K V T S E P Q P G F L E R L S E T S G G M F V G L M T F L I S F Y L I F T N E G R A L K T A T S L A B C L S L

40 50 60 70 80  
 arabidopsis C T M V D D T N A Y S . . . . . Y A F L D Y D P S E K T . . . . . V F K W V E R R K P E R Y S S A A P T S  
 mLUMA V V S P D S T S V A F N E F G R I V H I T C A I R T S K L I A D P N V V H I P A V K T R R H V E M Y Q W V E T E E S S E Y T E D C Q V K

90 100 110 120 130 140  
 arabidopsis P D A R L R L V S E R V D L T D N L V I S I S T G F F N S R L T S K S . . . . . K K W S A K E V A D S V L S D K S A L V V T S Q L E P S S  
 mLUMA K E T K Y S V N E R W S R S I V N S R N F D R E I G H K N P S A M A V E S F T A T A P P V Q I G R P F L S A G L I D K I D N F K A L S L A K

150 160 170 180 190 200  
 arabidopsis L F D H A S D L G E F V W Y E Y L V R K S P T K I A E A C K I V R . . . . . H V I S S T R E R C G L Y L I M A S T L G  
 mLUMA L F D H V D I T R G D F Y S E N P K Y P E V G D V R V S S V A G L S S D D P D L G P A H V V T V I A R Q R G D Q L I P Y S T K C G

210 220  
 arabidopsis . . . . . K Q W D K . . . . . G L Y K M Q M G P . . . . . V L E R A V I G S  
 mLUMA D T L L L L H H G D F S A E E V F R R E Q K S N S M K T W G L R A A G W M A M F M G L N L M T R I L Y T L V D W F P V F R D L V N I G L A

230 240  
 arabidopsis R L L P P A D S Y V F P Y K D P W R P W . . . . .  
 mLUMA R A F C V A T S L I L L V A A G W L F Y R P L W A A L I G C L A L V P I I A R T R V P A K K L E

gi|11283463 *Arabidopsis thaliana*

1 10 20 30 40  
 ceLUMA . . . . . M T P V T S I P H R I E D I W R T P I N . . . . . I N T C R S E I N I H K L Q C S D . . . . . C S S K F D S E T P F  
 mLUMA M A A N Y S S T S S R K E H V K V T S E P Q P G F L E R L S E T S G G M F V G L M T F L I S F Y L I F T N E G R A L K T A T S L A B C L S L

50 60 70 80 90 100 110  
 ceLUMA T Q H I D E C L E N A R D L N Y H M M H C . . . . . N R L T M M T Q R V S L Y E A S E C R K C C M C M E R F N E E A V I T H S K C T  
 mLUMA V V S P D S T S V A F N E F G R L V H I T G A L R T S K L I S D P N Y G V R L P A V K L R R H V E M Y Q W V E T E E S S E Y T E D C Q V K

120 130 140 150 160 170  
 ceLUMA . . . . . N V K S E Y S T F I Q N S K A L F G N M L T S Y D S L C N L F Q Y E T D E R I I Q T R E D L K Q P L P E G Y E D N E P V G . .  
 mLUMA K E T K Y S V N E R W S R S I V N S R N F D R E I G H K N P S A M A V E S F T A T A P P V Q I G R P F L S A G L I D K I D N F K A L S L A

180 190 200 210 220 230 240  
 ceLUMA . . . . . P D L H F D E L S E V F L E K Y Q D Y M I D V S N M I D V V F V R V T I K K Q R D E R T G S I V V S F P T R F M S R S I D H M E D A  
 mLUMA K L E D P H V D I I R R G D F F Y R S E N E K Y P E V G D V R V S F S Y A G L S S D D P D L G P A H V V T V I A R Q R G D Q L I P Y S T K S

250 260 270 280 290 300  
 ceLUMA T D E T S D V S E D C Q V E S D W D E Y D S D E L D D G . . . . . E D I N N Q S M E I G Y A A D E D N E E S F E Y D E E M V O V E A T . . .  
 mLUMA G D I L L L L H H G D F S A E E V F R R E Q K S N S M K T W G L R A A G W M A M F M G L N L M T R I L Y T L V D W F P V F R D L V N I G L K

ceLUMA . . . . .  
 mLUMA A F A P C V A T S L I L L V A A G W L F Y R P L W A A L I G C L A L V P I I A R T R V P A K K L E

gi:17570757 *Caenorhabditis elegans*

1 10 20 30 40 50 60  
 Potato MAATALLSSP...PTFSSSNSEISTLKKQSKILWNQK..KCGKFFVISEFCRKPPTQVGFSRRLM  
 mLUMA MAANYSSSTSRKKEHKVVFSEFQCFLERLSETSGGMFVGLMTFLLSFYIFITNEGRALRFAKTSIAEGLS

70 80 90 100 110 120 130  
 Potato FTALSSSLSLTFPFG...LFAEEETRMGSSVDLNAVSYFPTLMPFKKFFVFKWVETRKRSERYSSAAPL  
 mLUMA LVVSPDTHHVAEENEGRLVHIGALRRTSKLLDINAYGVHFAVGLRRLRHVEMYQWVETSESEYVTEGQV

140 150 160 170 180 190  
 Potato SPDAARLVVSRVVDITNLLIISVSTGPPNQQELKSKKESHSKDVADSVLSPKSLARVTSQKPAES  
 mLUMA KKEPTKYSVNEEWRSEIVNSRNPDFRGLGKNSAFAVSEPTLAPPVQIGRFFLSRGLIKIINFKASIA

200 210 220 230 240  
 Potato SLIDRHAIVDGGESVWVY.....DYIVRKSPTKAAAEENFRHYVASTAEK.....  
 mLUMA KLPDHRVDLIRRGDFVYHSENPKYPEVGDVVSFSAAGLSSDDPDLSPAHVVTIARLQRGDQLIPYSTKS

250  
 Potato .....PWLIVY.....  
 mLUMA GDITLLLHHGDFSAEEVFRREQKSNMKTWGLRAAGWMAFMGLNLMTRILYTLVDPVFEADLVNIGLK

Potato .....  
 mLUMA AFAPFCVATSLTLTVAAGWLFYRPLWAALIGCLALVPIIIARTRVPAKKLE

gi 14266213 Solanum tuberosum

1 10 20 30 40 50 60 70  
 dhLUMA MNRVAIVRWFALAAVVAAPAAQDDSGEPLGPPVAGPGLRDRDFGVLSRQSGLDRRVEMYQWR  
 mLUMA ..MAANYSSSTSRKEHVKVVTSEPPQPFLERLSETSGGMFVGLMTFLLSFYIFITNEGRALRFAKTSIAEG

80 90 100 110 120 130 140  
 dhLUMA SADPVAAGOGGYERHNSAPIDSSOFAPCHVNFTRMPEENRRMWSSEATLDGRPLDSEVLRALGEMKVF  
 mLUMA LSLVLSVSP...DSSHHSVAPENE...GLLVHIGALRRTSKLLSD.....PNYGVHHPAVKLERHVE

150 160 170 180 190 200 210  
 dhLUMA NFSRLPANI SATFQPECDGLGSSENPLAPQIGDLRVSWRRLRLLPPEGLLELRDAWRRLKPEAAAAALNA  
 mLUMA MYQWVETRSESYETEDGQVKKPEKYSYN.....TEWRSEIVNSRNPDFRGLGKNSAFAVSEPTA

220 230 240 250 260 270 280  
 dhLUMA APERPATVVLGEPQRDRRMSWGNLVAGVALRGGVVAVVASAEAKARSVGGDTEMDSGFRITKKNKPKK  
 mLUMA TAE.....FVQIGRFFLSAGLIDKIDNFKALSLAKLIDPHVDTIRRGDFPYHSE..NPRVY

290 300 310 320 330 340 350  
 dhLUMA BKNKKTQKTKLGRTRKERERQKSRKRGKGTAAQRDREKQSRRRRDEHEKRRRQSGGERRGMAMK  
 mLUMA HVGDRVRSYSTAGLSSDDPLG...PAHVVTVIARQRGDQLIPYSKSGDITLLLHHGDFSAEIVFR

360 370 380 390 400 410 420  
 dhLUMA TEREETKRETRHRCQAEKKARRRRGERTKONKAKEKRRKEKSKKRRQTPPTANRETEADQSSGR  
 mLUMA EQKSNMKTWGLRRAAGWMAFMGLNLMTRILYTLVDRFPPVFRDLVNLIGLKAFAPCVATSLTLLTVAAGWL

430 440 450  
 dhLUMA GGRBKADQSHRGKKRQYRSEKERGGRQNRG  
 mLUMA FYRPLWAALIGCLALVPIIIARTRVPAKKLE

gi 23120287 Desulfobacterium hafniense

1 10 20 30 40 50  
 silicibacter .....MSQVETHQVCFARKNATIGIHTSFIGIAVYVDFGKAVRRAALRAGCND  
 mLUMA MAANYSSSTSRKKEHKVVFSEFQCFLERLSETSGGMFVGLMTFLLSFYIFITNEGRALRFAKTSIAEGLS

60 70 80 90 100 110 120  
 silicibacter VVSVDHTATPQNEERLHHCGLALVFLADVALGVASACVTRDLRSEVFAWEDKQKTSRKLCS  
 mLUMA VVSVDSTHVAEENEGLVHIGALRRTSKLLSDINAYGVHFAVGLRRLRHVEMYQWVETSESEYVTEGQV

130 140 150 160 170 180 190  
 silicibacter GGEKTRPVYVQGNDAASGAEFRVPECHNPEMPTASRVIROCECTIGAEVVDDEISDGGSTPMLL  
 mLUMA QVKEKREKRYVNDNRSEIVNSRNPDFRGLGKNSAFAVSEPTLAPPVQIGRFFLSRGLIKIINFKASIA

200 210 220 230 240 250  
 silicibacter DSGQEDVARALSLQPAKLVAGQVVFQAVTARQGDTRVSRVVEITERAS.....VVGQRSD  
 mLUMA DNFKAISLAKLDEDFHVDLIRRGDFVYHSENPKYPEVGDVVSFSAAGLSSDDPDLSPAHVVTIARLQR

260 270 280 290 300 310 320  
 silicibacter TLPYTAONGRRIQLVAVELKTADEPQTAVSNNTKTKWLRLLVLLPFCGKADFCVVVFAISIEPFL  
 mLUMA QDLPYSYTKSGDITLLHHDFFSAEVRREKSNKTKWLRRAAGWMAFMGLNLMTRILYTLVDRFPPVFR

330 340 350 360 370 380 390  
 silicibacter GNTAASVTLISLQVATLVVCGTFAFAAMVYFRVLLTLLIAVATAAASAYLAKAAPPKPTP  
 mLUMA RDLVNLIGLKAFAPCVATSLTLLTVAAGWLFYRPLWAALIGCLALVPIIIARTRVPAKKLE.....

gi: 69301865 Silicibacter sp. Tm1040