



*LapD*  $\alpha 2$ -G  $\alpha 3$ -G  $\beta 2$ -G  $\beta 3$ -G  $\alpha 4$ -G

280 290 300 310 320 330 340

*LapD* GLNQRLGGGRTDELLEKAVGEQLSRECAKYPETQNLVTRLRGGEFFAVLAPGMTREEALQLAQSLDSALSSSL  
*P. putida* GLNARLGGGRTDQLLQAVGEQLRRTCASYPETNDLIRSRRGGEFFAVLAPGMVHEEAHLQAALQALQALQSL  
*P. aeruginosa* GLNQRLGGGRTDELLEKAVGEQLRRTCASYPETNDLIRSRRGGEFFAVLAPGCSREAEVRLAELCEGLNENL  
*Pectobacterium* GMNQRLGGGRTDALLASVGHILRNTQKQHTAESLLARLRGGEFFALFPCPLVLDKFEAYALIGELTRNIETL  
*Citrobacter* GLNQRFGGHTRDKLLNLIANLNAHKHEYAPLDSTLARLRGGEFFALLCPGVTHGEMLNMGNSLCKQLTAF  
*Polaromonas* MLNARLGHQRADTLHQQLVGGVLDKSMREHS..GQQAGRLKGGDFALLACPGGITS..PAQAASELHQRLNQA  
*Rhodoferax* TLNARLGHQRADDELLEKAVGEQLRRTCASYPETNDLIRSRRGGEFFAVVYPTTAS..PGEAGADLHQRLTQN  
*Dechloromonas* GINRRAGHRTADEVLRRIIGATLNALAADKP..NAAAAARLNGADFFALLLPVGVDR..PALQAEKLLHTLSDL  
*Cellvibrio* ELNTHLGRGQTDDELLEKAVGEQLRRTCASYPETNDLIRSRRGGEFFALLPSELPA..SDAIATELQAQKLNFI  
*Legionella* ELNQKQGYGQDQLVLTAKIKCSYWKQSS..VSTLARNGTFFALISHERDPA..LVFTEKCKEKEFEQ  
*Geobacter* ALNQKRLGHQRADTLHQQLVGGVLDKSMREHS..GQQAGRLKGGDFALLACPGGITS..PAQAASELHQRLNQA  
*V. alginolyticus* DDIYETKGYQRADAHVKELSQRLEKNTIDVPG..ATIAIRLSSDFFGLLFPHMDESELRLILSDIVNCVNGI  
*V. parahaemolyticus* DDIYETKGYQRADAHVKELSQRLEKNTIDVPG..ATIAIRLSSDFFGLLFPHMDESELRLILSDIVNCVNGI  
*V. harveyi* DDIYETKGYQRADAHVKELSQRLEKNTIDVPG..ATIAIRLSSDFFGLLFPHMDESELRLILSDIVNCVNGI  
*V. shilonii* QTYKADGYEAGDGLVRLSDLLKMTINIPN..TVIARLSTDFEGFVFNIDESSELKFAANSITICIQDI  
*V. cholerae\_1587* ELYEEKGYEAGDGMVRELRADRLKNSITIKD..ISIAIRLSTDFEGFVFNIDESSELKFAANSITICIQDI  
*V. fischeri* KYVEQDGYEAGDGLVRLSDLLKATLPASN..VILTRLSSDFFGLLFPHMDESELRLILSDIVNCVNGI  
*V. angustum* DSYKQSGYEAGDQLVOKITASRLK.ELSNDD..VTIARLSSDFFGLLFPKATKEELKFAENRNMVYTDI

*LapD*  $\beta 4$ -G  $\alpha 5$ -G  $\beta 5$ -G  $\alpha 0$ -E

350 360 370 380 390 400 410

*LapD* YATG.ATDVAAVASITGLAPFAHGDSPOAVTSLGDAQLAQAEQGGEQNWAC.LDQSLVADVGDHHAHWRHL  
*P. putida* HETG.ASDIDPVACITGLAPFSPGDSPOALLKLADALARAENQPTPGWAS.LEQGVAAVAADSQHAHWRHER  
*P. aeruginosa* ARTG.ASDLTPVAYIGISAFAGEGDSPOALLARAQDQALAQAESQPAQWAS.QDGTAALALNDSQ.DWHWDW  
*Pectobacterium* HLTG.ETDVPVAQYGVMPFRPGDTAQSFLTQQDQALAQAESNTDTTAPHDIPSVSAEQVETDRHRWFLN  
*Citrobacter* YATG.MSDQQPVAYITMVPFSGADNAQSLLFPQADRLLVBAETHTDHGV..VPTTEVPATPEQHLWFRV  
*Polaromonas* WLPNWVAEVPDLFHLAAVYQRAESIGDLSRADDALARAEEAGSPNSWHA..SEADSGSTARPAEQWRS  
*Rhodoferax* WLPDWVADVDPDLFQVAVPYHRDQDVGDLISRADDALARAEEAQSSNSCYA..SEADSGSTARPAEQWRNL  
*Dechloromonas* AAAAGLIEGE.RIGYVGSAYLHGQQTVGSLLSRIDALASAEQSGSLWACR..AEBNSGSTARPAEQWKKL  
*Cellvibrio* LIA..LGEQQLALPLIACQYHQGQKRGHLLQDLQALAKAELKGNRAMVL..SDTG.EQSPSLDRWREL  
*Legionella* LSQGITDKICKTYMGAAISYLHQPVSNLSMVDLAVKKAARETGVPYQCQ..EHDSTYKYPQLISGDE  
*Geobacter* AMEK.TALDDNIGHGLGASCLGSLTLTRLAEADLAVSSALQKGANSEWLRVVTGDSSETLPQGGQHWKDA  
*V. alginolyticus* NTDP.TGLAKPKASLGVASHSKDQKTRSEILSMVDNALSKAKAQPKPYGFIGSD..TPSSLMGKQQWKKAL  
*V. parahaemolyticus* NTDP.TGLAKPKASLGVASHSKDQKTRSEILSMVDNALSKAKAQPKPYGFIGSD..TPSSLMGKQQWKKAL  
*V. harveyi* NTDP.TGMAKPKASLGVASHSKDQKTRSEILSMVDNALSKAKAQPKPYGFIGSD..TPSSLMGKQQWKKAL  
*V. shilonii* NADP.TGLSKANASLGVVFNREKRNSTQMLSVLDNALTRAKAKSNPEIDYGYISSE..HTGVMIGKQQWRS  
*V. cholerae\_1587* NPDP.TGMKANLSLGVVFNKRSSTTTLLSLDNLAKAKSNPELNYGFISSD..TDKIILGKQQWKT  
*V. fischeri* KGDP.TATAPIDAELGVVFNERTKTTTEILSLADNALTLAHSNPPQPFYGFIADE..SEHELGMKQQWKAF  
*V. angustum* NSDP.LGIAPLHAAVGTIVVCSNETTISLLIASADNALNKARQEPKPEPLAVIESNEKKEKETSIGKQQWKAI

*LapD*  $\beta 1$ -E  $\beta 2$ -E  $\alpha 1$ -E  $\alpha 2$ -E

420 430 440 450 460 470 480

*LapD* LDQALNQRFFE LFFP VVAAQDTQLVLVH YKVLRSRL DEQG QTI P AGRFL PWLER F GWTA RLD RL ML ERV L  
*P. putida* LDQAF INGHFE LFFP VVICASSQVRLVH HKVISRLR DGGG EALP AGRFL PWLER F GWMPR LD RL ML LEKV L  
*P. aeruginosa* LDQAL TERRL L YFFP VVVDVDTQRVLVH HKVLARLD DPQA TAI A AGRFL PWIER F GWAARM DLAM LEQS L  
*Pectobacterium* LDQAL ILEQRRLQ LFFLQ PVVACDDPSQVLVH HKVLARIQ DGGG NSIA AGRFL PWIQR F GWDTR LD TML REVL  
*Citrobacter* LEHAL ENQQFQ LAFQ PVMDCRQPKILVH YKVLRSRI DEQG NTIT AGRFL PWIHR F GWSHR LD KV ML KLT L  
*Polaromonas* LTEAV ASGKRLAF YRVVGSQNAIHQ EGVI RLQD DTGT LLLPARD FMPMAAHL NLSAP TDL E VVRLA I  
*Rhodoferax* LTDVAVAGKRLAF YRVVGSANAAIHQ EGVI RLQD TAGALLP AGRFMPMAAHL NLSAP TDL E VVRLA I  
*Dechloromonas* LDGAI ETQRLLAF YFPVAGSGQ. LLHL ECP LRLQAT DDEG WELVA GAFMPMAASRL SMTTE DLT L VVRLA L  
*Cellvibrio* IQNALHNRRLT LGQYFPVQRDGG. LLHMDAPLRLQLD.. GELKPA AGRF IAWASRL GLLDLPAL DLAALQAGL  
*Legionella* IRNSLEQRKISLYAQAVTD.. GKNCFH KEIFVRIRN QBEGEELGAGYFIPVAERKLG LAYPIDOYVLN.EL  
*Geobacter* LVKALEERRITLDAQGVVNGPARKVQLLELFARIMQD.GKPLD AALFMPVAERLKLVSAPTDRIYVIEEAM  
*V. alginolyticus* VEEAIHSDWVKFRFQAANKTWGK..VFHNEVFS.SIEKDGGETYRANQYLFALQELDATNIDFQYVIESMI  
*V. parahaemolyticus* VEEAIHSDWVKFRFQAANKTWGK..VFHNEVFS.SIEKDGGETYRANQYLFALQELDATNIDFQYVIESMI  
*V. harveyi* VEEAIHSDWIKFRFQAANKTWGK..VFHNEVFS.SIEKDGGETYRANQYLFALQELDATNIDFQYVIESMI  
*V. shilonii* VEEAISDDAVTFRFQAANSSGGE..TYHREVFS.AIEMNGERYTANQYLLALEQLDASHIDFQYVIMSVI  
*V. cholerae\_1587* VEEAIHSDWVTFRYQAANSSGGE..TYHREVFS.AFEMNGERYTANQYLLALEQLDASHIDFQYVIMSVI  
*V. fischeri* VEEAIHNEHLQFTLLQATTPNGT..VFHNEVFS.AIEKDEQRYSANQYLFALQELDNETHYDFQYVIRTMI  
*V. angustum* VDEAIANKLIHFTFRKAINVDNK..ILHKEAFA.YIQDKNQRFNAGGFLSAIETLNEGANFDRIYIVDITL

*LapD*  $\beta 3$ -E  $\alpha 3$ -E  $\alpha 3$ -E  $\alpha 3$ -E  $\beta 4$ -E  $\alpha 4$ -E

490 500 510 520 530 540 550

*LapD* EQMAGHESS..LALNLSAATLADFPQALNKVFEILRHAHNSLGAR.LTTEIGE.EQLPEQAVLEQLTRRLR  
*P. putida* AHLRHGDQV..LALNLSAATLADFPKALQRFVFLGKQNAALGPR.LVFEIGE.EQLPEQAALEQLTRRLR  
*P. aeruginosa* EHLRRHRP..LALSLSAASVNRNAQTFAPLALLAKQAPQEARQ.LTLELDE.EHLPPAAAELERLSQVLE  
*Pectobacterium* DYLKQHDGN..LALSLSGTVLNLHLLADLLAPLRKHPAVARR.LTLELDE.NQLPDSQAALAILKLNLE  
*Citrobacter* NQRLKTAPEG..LALSISGSSVSSASAIADLLNPLRKHAPRLASQ.LTLELDE.NQLPDPGHQMAALFVKAAANQ  
*Polaromonas* AHLRTPDGD..IAVNLSAETIADFSTRYELRMLLEFHEPICR.LLFEVPEQGVFKQFNAPRDLVLVTLK  
*Rhodoferax* EYLRTPDGD..IAVNLSAETIADFSTRYELRMLLQANPDMCKR.LLFEVPEYGFVKQFDAPRDLVHAVK  
*Dechloromonas* DRIAAGLPA..VAVNLSGESILDASFRARLYAQIAARRDLAPR.LWMEVSEIGAFQHFEEFHAFCDALRP  
*Cellvibrio* QQLQOTPSVP.LAINLSAESLNCARFREQALQLIHASKPLAKL.LWLDPEVAVHLRHMDLEKAFCTQKKA  
*Legionella* TLMDIATHTH.FALNLSIEDTLANKVNSTGYLRQLHESDTPAAVLRNLSLEINAEVHLSHFSNSKFCIKQAK  
*Geobacter* KVDFRSMAVDRVAINLSQSLSDGAFGRWGLFSFKLGLPEEAPH.VSFEFSEFAAVQHLQLRDFGGAARV  
*V. alginolyticus* KMLENGELNDPVAINIAQSLSLQSPFIRWTTSMLEKHKAVASK.LHFEIPEECFIDPHHTALLCNAIRQ  
*V. parahaemolyticus* KMLESSELNDPVAINIAQSLSLQSPFIRWTTSMLEKHKAVASK.LHFEIPEECFIDPHHTALLCNAIRQ  
*V. harveyi* KMLESSELKEPVAINIAQSLSLQSPFIRWTTSMLEKHKAVAPM.LHFEIPEACFIDPHHTALLCNAIRQ  
*V. shilonii* NKLEREEMSDSMANLITPTSIAGQSPFIRWISQVLEKHRINDK.LHFEIPEACFIDPHHTALLCNAIRQ  
*V. cholerae\_1587* QQLEKGETLDPALAINLAQGISLQSPFIRWISQVLEKHKLSVANL.LHFEIPEECGFVNEPHYTALFCNAVNR  
*V. fischeri* ERVSSGETIQPVAINLNRVSNPSPFIRWLTITLKKHKSAPL.FHFEIPEECFIDPHHTALLCNAVNR  
*V. angustum* SDIEKSPASVPLAINITQSVNDTGFIRWLSKLLQAAQHIKDR.VLFEIPEECFIDPHHTALLCNAIRQ

