



Table S1. Genes of *L. helveticus* D75 and D76 that are encoding proteins, involved in biosynthesis of exopolysaccharide components.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>dltB</i>	52716..53954	1485896..1487134	D-alanyl transfer protein involved in the incorporation of D-alanine into lipoteichoic acids
<i>dltD</i>	54245..55531	1487425..1488711	membrane protein involved in the biosynthesis of D-alanyl-lipoteichoic acid
<i>lysA</i>	60027..60964	1493207..1494144	glycoside hydrolase family 25 with lysozyme activity, involved in peptidoglycan catabolic process
<i>eps</i>	61238..62854	1494418..1496034	polysaccharide transporter
<i>hyd</i>	98080..98562	1532643..1533125	hydrolase associated with cell wall catabolism and containing the N1pC / P60 protein domain. This protein carries out the hydrolysis of peptidoglycan during bacterial growth, development and cell division
<i>wzx</i>	299076..300539	1733641..1735104	Flipase transporter, involved in synthesis of exopolysaccharides by polymerization and export
<i>tagA</i>	418185..418913	1852750..1853478	glycosyltransferase of the WecB / TagA / CpsF family. The TagA protein family is involved into biosynthesis of cell wall polyglycerol phosphate
<i>epsE</i>	418921..420021	1853486..1854586	glycosyltransferase with glycosyltransferase family 4 and glycosyltransferase group 1 domains. This protein involved in exopolysaccharides biosynthesis pathway
<i>tagF</i>	426790..427944	1861355..1862509	CDP-glycerol: polyglycerophosphotransferase. This protein participates in the biosynthesis of teichoic acid
<i>epsU</i>	427949..429379	1862514..1863944	capsular biosynthesis protein
<i>gtrA</i>	540636..541175	1975201..1975740	dolichyl-phosphate beta-D-mannosyltransferase is an intergar membrane protein, involved into biosynthesis of polysaccharides
<i>murE</i>	686618..687970	64244..65596	UDP-N-acetylmuramoylalanyl-D-glutamate-2,6-diamino-pimelate ligase. This protein involved into the second step of peptidoglycan biosynthesis
<i>gtrA</i>	744428..744844	122054..122470	dolichyl-phosphate beta-D-mannosyltransferase, an intergar membrane protein involved into biosynthesis of polysaccharides
<i>pbp</i>	760107..761921	137733..139880 547	penicillin-binding protein. This protein involved into the final step of peptidoglycan biosynthesis and encoded by pseudogene
<i>murG</i>	764620..765726	142246..143352	UDP-N-acetylglucosamine--N-acetylmuramyl-(pentapeptide) pyrophosphoryl-undecaprenol N-

			acetylglucosamine transferase. This peptide involved into the peptidoglycan biosynthesis pathway
<i>pbp</i>	980532..981629	358127..359224	penicillin-binding protein. Involved into the final step of peptidoglycan biosynthesis.
<i>ykuD</i>	983163..984368	360758..361963	transpeptidase with peptidoglycan binding domain. This protein gives rise to an alternative pathway for peptidoglycan cross-linking
<i>pbp1A</i>	1158878..1161178	536232..538532	Membrane penicillin-binding carboxypeptidase 1A. This protein involved into the final step of peptidoglycan biosynthesis.
<i>lys</i>	1329788..1331023	708522..709757	protein with lysozyme activity and surface later protein A domain. This protein involved into peptidoglycan catabolic process
<i>pbp2B</i>	1450192..1452300	828926..831034	membrane penicillin-binding carboxypeptidase 2B with transpeptidase domain. This protein involved into the final step of peptidoglycan biosynthesis.
<i>ykuD</i>	1576492..1577166	956606..957280	transpeptidase with YkuD domain. It has been shown that domain YkuD can act as an L,D-transpeptidase that gives rise to an alternative pathway for peptidoglycan cross-linking
<i>dacA</i>	1578143..1579438	958257..959552	D-alanyl-D-alanine carboxypeptidase. This protein involved into the peptidoglycan biosynthesis and degradation process

Table S2. Genes of *L. helveticus* D75 and D76 that are encoding surface adhesive proteins.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>mucBP</i>	383312..383779	1817877..1818344	mucin binding protein, encoding by hypothetical gene
<i>mucBP</i>	873784..874104	251411..251731	mucin binding protein
<i>mucBP</i>	874101..874787	251728..252414	mucin binding protein
<i>mucBP</i>	874774..875076	252401..252703	mucin binding protein, encoding by hypothetical gene
<i>mucBP</i>	875124..875291	252751..252918	mucin binding protein
<i>fbpA</i>	1144883..1146577	522237..523931	fibronectin
<i>slpA</i>	1219708..1220208	597062..597562	S-layer protein
<i>srtA</i>	1226873..1227562	604227..604916	class A sortase
<i>mucBP</i>	1584744..1585364	964858..965478	mucin binding protein, encoding by hypothetical gene
<i>slpA</i>	1823168..1823740	1203282..1203854	S-layer protein
<i>fbpIII</i>	1847693..1849087	1227807..1229201	protein with fibronectin type III domain
<i>slpA</i>	1866469..1867833	1246583..1247947	S-layer protein
<i>slpA</i>	1989578..1990480	1369692..1370594	S-layer protein

Table S3. Genes of *L. helveticus* D75 and D76 that are encoding proteins, involved in casein utilization.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>pepN</i>	208194..210728	1642757..1645291	intracellular peptidase
<i>dtpT</i>	210838..211719	1645401..1646267	proton-dependent oligopeptide transporter
<i>pepD4</i>	217882..219294	1652447..1653859	D4 family dipeptidase
<i>yvpB</i>	264253..264966	1698818..1699531	cysteine protease
<i>pepA</i>	478203..479285	1912768..1913850	A family intracellular peptidase
<i>pepM24</i>	541758..542585	1976323..1977150	M24 family cobalt-dependent methionine aminopeptidase
<i>pepM16</i>	590270..591484	2026215..2027429	M16 family peptidase
<i>clpP</i>	622701..623285	327..911	ATP-dependent protease
<i>pepCE</i>	882452..883765	260079..261392	CE family cysteine peptidase
<i>pepT2</i>	985911..987197	363506..364792	T2 family intracellular tripeptidase
<i>pepM20</i>	1050472..1051737	428066..429331	M20 family peptidase
<i>prtH</i>	1059720..1065005	437314..440053	extracellular proteinase lactocepin H (in <i>L. helveticus</i> D76 encoded by pseudoene)
<i>pepO2</i>	1066263..1068209	443550..445496	O2 family endopeptidase
<i>pepV</i>	1088319..1089722	465606..467009	intracellular dipeptidase
<i>pepT1</i>	1190204..1191445	567558..568799	T1 family intracellular tripeptidase
<i>pepM23</i>	1205766..1206221	583120..583575	M23 family peptidase
<i>pepO</i>	1257415..1259358	634769..636712	O family endopeptidase
<i>pepD2</i>	1278053..1279474	656787..658208	D2 family dipeptidase
<i>oppA</i>	1285191..1286711	663925..665445	periplasmic oligopeptide-binding protein with transmembrane transporter activity
<i>oppA</i>	1287156..1288907	665890..667641	periplasmic oligopeptide-binding protein with transmembrane transporter activity
<i>oppC</i>	1289113..1290042	667847..668776	periplasmic oligopeptide transport protein
<i>oppB</i>	1290057..1291016	668791..669750	periplasmic oligopeptide transport protein
<i>oppF</i>	1291019..1292005	669753..670739	ATP-binding oligopeptide ABC transporter
<i>oppD</i>	1292009..1293043	670743..671777	ATP-binding oligopeptide ABC transporter
<i>pepQ2</i>	1319996..1321105	698730..699839	Q2 family Pro-Xaa proline peptidase
<i>pepX</i>	1333459..1335840	712193..714574	intracellular x-prolyl-dipeptidyl peptidase
<i>pepQ</i>	1382902..1383483	761636..762217	intracellular peptidase
<i>pepQ</i>	1383486..1384103	762220..762837	intracellular peptidase
<i>oppA3</i>	1384117..1385724	762851..764458	periplasmic oligopeptide-binding protein with transmembrane transporter activity, encoded by pseudogene
<i>pepM1</i>	1508274..1509788	887008..888522	M1 family membrane alanine peptidase
<i>prtH3</i>	1516632..1521602	895366..900336	extracellular proteinase lactocepin H3
<i>prtP</i>	1588098..1589006	968212..969120	putative cell wall associated proteinase
<i>pepQ</i>	1632307..1633413	1012421..1013527	Pro-Xaa peptidase
<i>pepC</i>	1716220..1717569	1096333..1097682	C family peptidase
<i>pepD</i>	1808406..1809830	1188520..1189944	D family dipeptidase
<i>pepG</i>	1843780..1845093	1223894..1225207	E2 family intracellular peptidase
<i>pep</i>	1907056..1908292	1287170..1288406	serine protease
<i>pepI</i>	1940701..1941585	1320815..1321699	I family Pro-Xaa peptidase

Table S4. Genes of *L. helveticus* D75 and D76 that are encoding proteins, involved in utilization of milk sugars.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>glcU</i>	153033..153920	1587596..1588483	glucose transporter
<i>lctP2</i>	253742..254791	1688498..1689356	L-lactate permease, encoded by pseudogene
<i>lacS</i>	1426981..1428897	805715..807631	lactose permease
<i>lacR</i>	1433031..1434038	811765..812772	transcriptional regulator
<i>lacL</i>	1435240..1437126	813974..815860	large subunit of beta-galactosidase
<i>lacM</i>	1437110..1438066	815844..816800	small subunit of beta-galactosidase
<i>ldh</i>	1779366..1780337	1159479..1160450	lactate dehydrogenase

Table S5. Genes of *L. helveticus* D75 and D76 that are encoding proteins, involved in Leloir metabolic pathway.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>galM</i>	1377923..1378918	756657..757652	galactose mutarotase
<i>galT</i>	1379039..1380502	757773..759236	galactose-1-phosphate uridyltransferase
<i>galK</i>	1380524..1381690	759258..760424	galactokinase
<i>galE</i>	1438171..1439163	816905..817897	UDP-galactose 4-epimerase

Table S6. Genes of *L. helveticus* D75 and D76 that are encoding CRISPR-Cas system.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
CRISPR1	1360958..1361168	739692..739902	first CRISPR array
CRISPR2	1490768..1491325	869502..870059	second CRISPR array
CRISPR3	1492138..1493550	870872..872284	third CRISPR array
<i>cas2</i>	1493735..1494016	872469..872750	type I-B CRISPR-associated endonuclease Cas2
<i>cas1</i>	1494022..1495011	872756..873745	type I-B CRISPR-associated endonuclease Cas1
<i>cas4</i>	1495021..1495512	873755..874246	type I-B CRISPR-associated endonuclease Cas4
<i>cas3</i>	1495528..1497957	874262..876691	type I-B CRISPR-associated helicase / Cas3 endonuclease
<i>cas5</i>	1498100..1498813	876834..877547	type I-B CRISPR-associated protein Cas5
<i>cas7</i>	1498800..1499702	877534..878436	type I-B CRISPR-associated protein Cas7
<i>cas8b1</i>	1499721..1501478	878455..880212	type I-B CRISPR-associated protein Cas8b1
<i>cas6</i>	1501496..1502251	880230..880985	type I-B CRISPR-associated endonuclease Cas6

Table S7. Genes of *L. helveticus* D75 and D76 that are encoding proteins, involved into specific antibacterial antagonism.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>slpA1</i>	196015..197187	1630578..1631750	surface layer protein, probably involved in bacteriocin biosynthesis
<i>helJ1</i>	197306..198268	1631869..1632831	class III bacteriocin helveticin J. Peptide toxin produced by bacteria to inhibit the growth of a similar or closely related bacterial strain
<i>helJ2</i>	198298..198612	1632861..1633175	open reading frame of bacteriocin class III helveticin J
<i>cvpA</i>	225735..226271	1660300..1660836	CvpA family protein. This protein participates in the synthesis of colicin V bacteriocin (<i>cvaC</i> gene)
<i>entI</i>	241697..242020	1676262..1676585	enterocin A immunity protein
<i>entI</i>	255040..255312	1689605..1689877	enterocin A immunity protein, encoded by hypothetical gene
<i>helJ3</i>	467742..468227	1902307..1902792	class III bacteriocin helveticin J. Peptide toxin produced by bacteria to inhibit the growth of a similar or closely related bacterial strain. This protein encoded by hypothetical gene
<i>slpA2</i>	468321..469397	1902886..1903962	surface layer protein, probably involved in bacteriocin biosynthesis
<i>entI</i>	518263..518628	1952828..1953193	enterocin A immunity protein
<i>slpA3</i>	1509877..1510854	888611..889588	surface layer protein, probably involved in bacteriocin biosynthesis
<i>helJ4</i>	1507159..1508136	885893..886870	class III bacteriocin helveticin J. Peptide toxin produced by bacteria to inhibit the growth of a similar or closely related bacterial strain.
<i>slpA4</i>	1789582..1790658	1169695..1170771	surface layer protein, probably involved in bacteriocin biosynthesis
<i>helJ5</i>	1790748..1791497	1170861..1171610	class III bacteriocin helveticin J. Peptide toxin produced by bacteria to inhibit the growth of a similar or closely related bacterial strain.

Table S8. Genes of *L. helveticus* D75 and D76 that are encoding proteins, involved into antibiotics and xenobiotics tolerance.

Gene	Position in the genome of <i>L. helveticus</i> D75	Position in the genome of <i>L. helveticus</i> D76	Gene translation product
<i>vanZ</i>	664276..664791	41902..42417	membrane protein that confers a low level of resistance to the glycopeptide antibiotic teicoplanin
<i>vanZ</i>	681652..682266	59278..59892	membrane protein that confers a low level of resistance to the teicoplanin antibiotic
<i>blaZ</i>	685285..686298	62911..63924	class C beta-lactamase protein that providing multi-resistance to β -lactam antibiotics
<i>pbpX</i>	818620..819702	196246..197328	penicillin binding protein containing beta-lactamase domain
<i>mprF</i>	1610666..1611692	990780..991806	Phosphatidylglycerol lysyltransferase, encoded by pseudogene
<i>had</i>	1626502..1627281	1006616..1007395	4-nitrophenylphosphatase. This protein carries out biodegradation of aminobenzoate xenobiotics by acting on ester bonds
<i>terC</i>	1922220..1923008	1302334..1303122	tellurium resistance protein embedded in the bacterial cell membrane
<i>pbpX</i>	1977115..1978125	1357229..1358239	penicillin binding protein containing beta-lactamase domain