

Supplementary material

**Dextranucrase expression is concomitant with that of
replication and maintenance functions of the pMN1 plasmid
in *Lactobacillus sakei* MN1**

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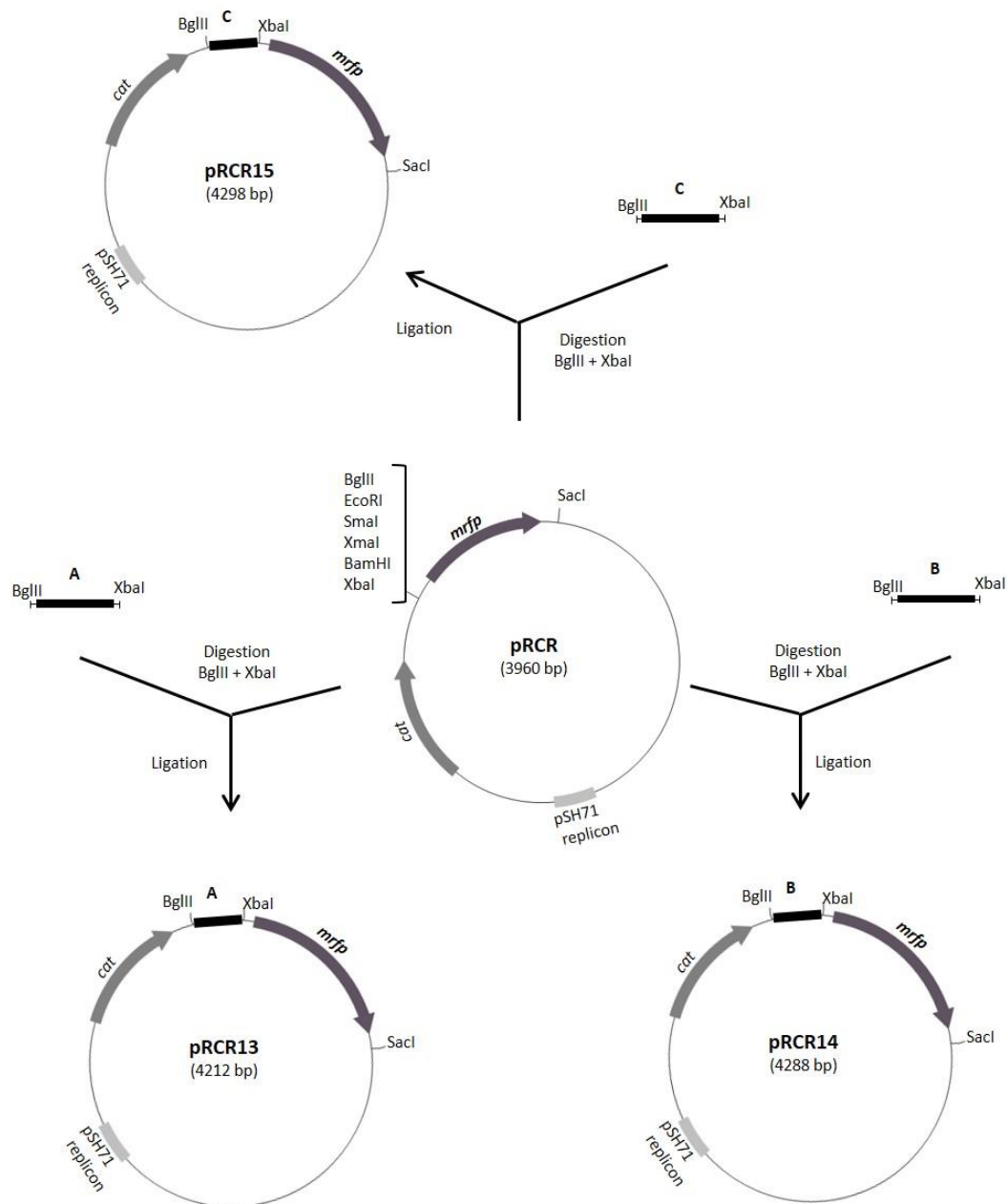


Figure S1. Scheme of construction of plasmids pRCR13, pRCR14 and pRCR15. Maps of these plasmids and of the parental pRCR are depicted. The pertinent restrictions sites as well as the *mrfp* gene encoding the mCherry and the *cat* gene, which encodes the chloramphenicol acetyltransferase, are shown.

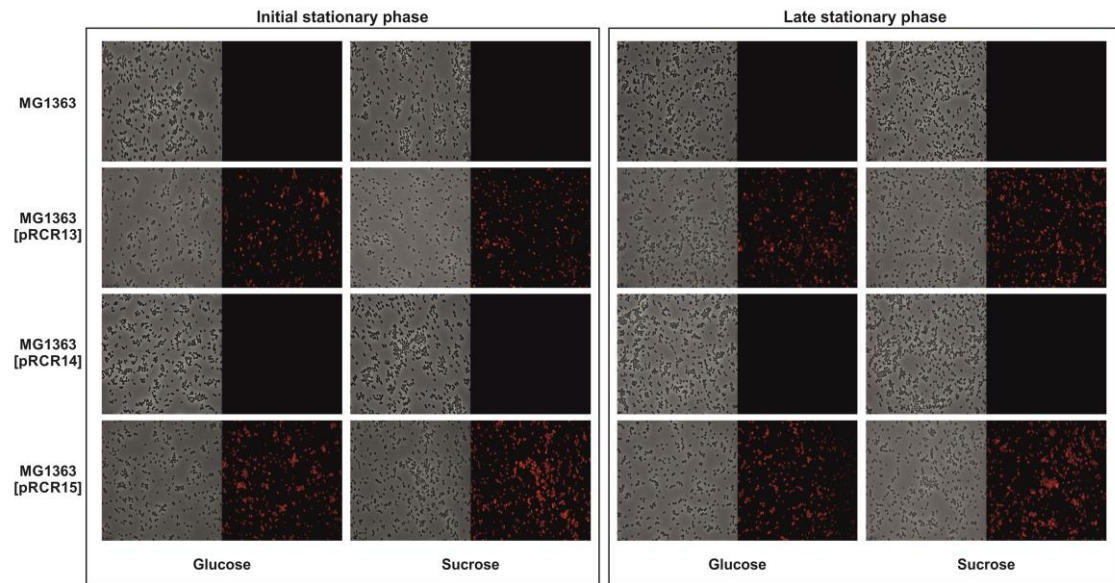


Figure S2. Detection of fluorescence in *Lactococcus lactis* strains. Cultures of the indicated strains grown in M17G (glucose) or M17GS (sucrose) and were analysed at the initial exponential phase or at late stationary phase by phase contrast (left panels) or fluorescence (right panels) microscopy.

Figure S3. Multiple alignment (CLUSTALX 2.1) of the amino acid sequences of the dextransucrases of *Lb. sakei* MN1, *Lb. sakei* Kg15 and *Lb. curvatus* 1624. Symbols: (*) identical amino acids in all sequences, (:), amino acids with very similar properties and (.), amino acids with properties with low similarity.

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Lb. sakei MN1      MLRNYYFGETKTHYKLYKCGKNWAVMGI SLFPLGLGMLVTSQPVSADVTATSTSSSAVRT 60
Lb. sakei Kg15    MLRNYYFGETKTHYKLYKCGKNWAVMGI SLFPLGLGMLVTSQPVSADVTATSTSSSAVRT 60
Lb. curvatus TMW1624 MLRNYYFGETKTHYKLYKCGKNWAVMGI SLFPLGLGMLVTSQPVSADVTATSTSSSAVRT 60
*****

Lb. sakei MN1      DAISESSSSAAKAETTSASSSSAVKAETTSASSSSAAKAETAAITTAGVANADSQTSAEV 120
Lb. sakei Kg15    DAIS-----ASSSSAAKAETAAITTAGVANADSQTSAEV 94
Lb. curvatus TMW1624 DAISESSSSAAKAETTSASSSSAVKAETTSASSSSAAKAETAAITTAGVANADSQTSAEV 120
****

Lb. sakei MN1      TADSTSTSQVVTNNSNNQNNTAQFAGQEAAAPVSEDTSDDSERPTPTVANNDKPAIDSVD 180
Lb. sakei Kg15    TADSTSTSQVVTNNSNNQNNTAQFAGQEAAAPVSEDTSDDSERPTPTVANNDKPAIDSVD 154
Lb. curvatus TMW162 TADSTSTSQVVTNNSNNQNNTAQFAGQEAAAPVSEDTSDDSERPTPTVANNDKPAIDSVD 180
*****

Lb. sakei MN1      TSQPATAAPKADTDVSTLQVDATTKTDSDIKEDTPTDKTTDTKTVQLTTVEGTSKQVVT 240
Lb. sakei Kg15    TSQPATAAPKADTDVSTLQVDATTKTDSDIKEDTPTDKTTDTKTVQLTTVEGTSKQVVT 214
Lb. curvatus TMW1624 TSQPATAAPKADTDVSTLQVDATTKTDSDIKEDTPTDKTTDTKTVQLTTVEGTSKQVVT 240
*****

Lb. sakei MN1      PKEESSTDKSSVSVSKQTDKTSLPTVATATATTVSKI PSVTGDYQFDEKTKTYFTGKDG 300
Lb. sakei Kg15    PKEESSTDKSSVSVSKQTDKTSLPTVATATATTVSKI PSVTGDYQFDEKTKTYFTGKDG 274
Lb. curvatus TMW1624 PKEESSTDKSSVSVSKQTDKTSLPTVATATATTVSKI PSVTGDYQFDEKTKTYFTGKDG 300
*****

Lb. sakei MN1      HPVTGLVYANNILQYFDETGHVQKQYVVTIAGHVYYFDPASGAAQTGVNQIDGKMGVGFKS 360
Lb. sakei Kg15    HPVTGLVYANNILQYFDETGHVQKQYVVTIAGHVYYFDPASGAAQTGVNQIDGKMGVGFKS 334
Lb. curvatus TMW1624 HPVTGLVYANNILQYFDETGHVQKQYVVTIAGHVYYFDPASGAAQTGVNQIDGKMGVGFKS 360
*****

Lb. sakei MN1      DGSQITSGFSDNAGNSYFDES GMTVTRQTIAGKTYFDFDKGHLRKGYSTIIDNQLYY 420
Lb. sakei Kg15    DGSQITSGFSDNAGNSYFDES GMTVTRQTIAGKTYFDFDKGHLRKGYSTIIDNQLYY 394
Lb. curvatus TMW1624 DGSQITSGFSDNAGNSYFDES GMTVTRQTIAGKTYFDFDKGHLRKGYSTIIDNQLYY 420
*****

Lb. sakei MN1      FDLKTGESVSTTTSNFKSGLTSQTD DTTPHNSAVNMSKDSFTTV DGF LTAESWYV PKDIQ 480
Lb. sakei Kg15    FDLKTGESVSTTTSNFKSGLTSQTD DTTPHNSAVNMSKDSFTTV DGF LTAESWYV PKDIQ 454
Lb. curvatus TMW1624 FDLKTGESVSTTTSNFKSGLTSQTD DTTPHNSAVNMSKDSFTTV DGF LTAESWYV PKDIQ 480
*****

Lb. sakei MN1      TSATDWRASPEDFRPIMMTWWPTKQIQAAAYLNHMVSEGLLSDDKFKSATDDQTL LNQAA 540
Lb. sakei Kg15    TSATDWRASPEDFRPIMMTWWPTKQIQAAAYLNHMVSEGLLSDDKFKSATDDQTL LNQAA 514
Lb. curvatus TMW1624 TSATDWRASPEDFRPIMMTWWPTKQIQAAAYLNHMVSEGLLSDDKFKSATDDQTL LNQAA 540
*****

Lb. sakei MN1      HAVQLQIELKIQQTKSVEWLRTTMHNF IKSQPGYNVTSETPSNDHLQGGALSYINSVLT P 600
Lb. sakei Kg15    HAVQLQIELKIQQTKSVEWLRTTMHNF IKSQPGYNVTSETPSNDHLQGGALSYINSVLT P 574
Lb. curvatus TMW1624 HAVQLQIELKIQQTKSVEWLRTTMHNF IKSQPGYNVTSETPSNDHLQGGALSYINSVLT P 600
*****

Lb. sakei MN1      DANSNFRMLMNRNPTQQDGRHYNTDTSEGGYELLANDVDNSNPVVQAEQLNWL YFLTHF 660
Lb. sakei Kg15    DANSNFRMLMNRNPTQQDGRHYNTDTSEGGYELLANDVDNSNPVVQAEQLNWL YFLTHF 634
Lb. curvatus TMW1624 DANSNFRMLMNRNPTQQDGRHYNTDTSEGGYELLANDVDNSNPVVQAEQLNWL YFLTHF 660
*****

Lb. sakei MN1      GEIVKNDPSANFDSVRVDAVDNVDADLLNITAA YFRDVYGV DKNDLTANQHLSILEDWGH 720
Lb. sakei Kg15    GEIVKNDPSANFDSVRVDAVDNVDADLLNITAA YFRDVYGV DKNDLTANQHLSILEDWGH 694
Lb. curvatus TMW1624 GEIVKNDPSANFDSVRVDAVDNVDADLLNITAA YFRDVYGV DKNDLTANQHLSILEDWGH 720
*****

Lb. sakei MN1      NDPLYVKDHGSDQLTMD DYMHTQLIWSLTKNPNDRS AMRRFMEYYLVDRAKDNTSDQAIP 780
Lb. sakei Kg15    NDPLYVKDHGSDQLTMD DYMHTQLIWSLTKNPNDRS AMRRFMEYYLVDRAKDNTSDQAIP 754
Lb. curvatus TMW1624 NDPLYVKDHGSDQLTMD DYMHTQLIWSLTKNPNDRS AMRRFMEYYLVDRAKDNTSDQAIP 780
*****

Lb. sakei MN1      NYSFVRAHDSEVQT VIGDIVAKLYPDVKNSLAPSMEQLAAAFKVYDAD MNSVNKKYTQYN 840
Lb. sakei Kg15    NYSFVRAHDSEVQT VIGDIVAKLYPDVKNSLP-SMEQLAAAFKVYDAD MNSVNKKYTQYN 813
Lb. curvatus TMW1624 NYSFVRAHDSEVQT VIGDIVAKLYPDVKNSLAPSMEQLAAAFKVYDAD MNSVNKKYTQYN 840
*****

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Lb. sakei MN1 MPAAYAMLLTNKDTIPRVYYGDMYTDDGQYMATKSPYYDAISALLKARIKYVAGGQTMV 900
Lb. sakei Kg15 MPAAYAMLLTNKDTIPRVYYGDMYTDDGQYMATKSPYYDAISALLKARIKYVAGGQTMV 873
Lb. curvatus TMW1624 MPAAYAMLLTNKDTIPRVYYGDMYTDDGQYMATKSPYYDAISALLKARIKYVAGGQTMV 900

Lb. sakei MN1 DKHDILTSVRFVGDGIMNASDKGSTTARTQGIGVIVSNNDALALKGDTVTLHMGIAHANQA 960
Lb. sakei Kg15 DKHDILTSVRFVGDGIMNASDKGSTTARTQGIGVIVSNNDALALKGDTVTLHMGIAHANQA 933
Lb. curvatus TMW1624 DKHDILTSVRFVGDGIMNASDKGSTTARTQGIGVIVSNNDALALKGDTVTLHMGIAHANQA 960

Lb. sakei MN1 YRALLLTTDGLMKYTSNDGAPIRYTDANGDLIFTSADIKGYQNVESGFLSVWVPGAS 1020
Lb. sakei Kg15 YRALLLTTDGLMKYTSNDGAPIRYTDANGDLIFTSADIKGYQNVESGFLSVWVPGAS 993
Lb. curvatus TMW1624 YRALLLTTDGLMKYTSNDGAPIRYTDANGDLIFTSADIKGYQNVESGFLSVWVPGAS 1020

Lb. sakei MN1 DTQDARATGSSAANKTGDTLHNSAALDSNVIYEGFSNFQEMPTTHDEFNTVKIAQNADLF 1080
Lb. sakei Kg15 DTQDARATGSSAANKTGDTLHNSAALDSNVIYEGFSNFQEMPTAHDEFNTVKIAQNADLF 1053
Lb. curvatus TMW1624 DTQDARATGSSAANKTGDTLHNSAALDSNVIYEGFSNFQEMPTTHDEFNTVKIAQNADLF 1080
 *****;*****

Lb. sakei MN1 KSWGVTSFQLAPQYRSSDDTSFLDSIIKNGYAFTRDYDLGFNTPTKYGDVDDLADAIRAM 1140
Lb. sakei Kg15 KSWGVTSFQLAPQYRSSDDTSFLDSIIKNGYAFTRDYDLGFNTPTKYGDVDDLADAIRAM 1113
Lb. curvatus TMW1624 KSWGVTSFQLAPQYRSSDDTSFLDSIIKNGYAFTRDYDLGFNTPTKYGDVDDLADAIRAM 1140

Lb. sakei MN1 HSVGIVQVMADFVDPQIYNLPGQEVVAVNRTNNTNFGTPNQSDQLQNLVYVNSKGGGEYQAK 1200
Lb. sakei Kg15 HSVGIVQVMADFVDPQIYNLPGQEVVAVNRTNNTNFGTPNQSDQLQNLVYVNSKGGGEYQAK 1173
Lb. curvatus TMW1624 HSVGIVQVMADFVDPQIYNLPGQEVVAVNRTNNTNFGTPNQSDQLQNLVYVNSKGGGEYQAK 1200

Lb. sakei MN1 YGGEFLDLLRLEHPDLFTTNQISTGVPIDGSTKIKEWSAKYFNGSDIQGKGADYVVKDGA 1260
Lb. sakei Kg15 YGGEFLDLLRLEHPDLFTTNQISTGVPIDGSTKIKEWSAKYFNGSDIQGKGADYVVKDGA 1233
Lb. curvatus TMW1624 YGGEFLDLLRLEHPDLFTTNQISTGVPIDGSTKIKEWSAKYFNGSDIQGKGADYVVKDGA 1260

Lb. sakei MN1 SQEYFKITSNANDESFLPKQFMNQDAMTGFTTDEKGTYYSTSGYQAKQSFQIGDDGQYY 1320
Lb. sakei Kg15 SQEYFKITSNANDESFLPKQFMNQDAMTGFTTDEKGTYYSTSGYQAKQSFQIGDDGQYY 1293
Lb. curvatus TMW1624 SQEYFKITSNANDESFLPKQFMNQDAMTGFTTDEKGTYYSTSGYQAKQSFQIGDDGQYY 1320

Lb. sakei MN1 YFDADGYMVTGSQTINGKQYYFLPNGVELREAFQNASGNTVYYGKTSYVAVKSKYVVDQS 1380
Lb. sakei Kg15 YFDADGYMVTGSQTINGKQYYFLPNGVELREAFQNASGNTVYYGKTSYVAVKSKYVVDQS 1353
Lb. curvatus TMW1624 YFDADGYMVTGSQTINGKQYYFLPNGVELREAFQNASGNTVYYGKTSYVAVKSKYVVDQS 1380

Lb. sakei MN1 GVAYYFDVNGNMVADRMMILDGHTQYFFAGGSQAKDQFLIGSDGNLRYFDQSSGNMVTNR 1440
Lb. sakei Kg15 GVAYYFDVNGNMVADRMMILDGHTQYFFAGGSQAKDQFLIGSDGNLRYFDQSSGNMVTNR 1413
Lb. curvatus TMW1624 GVAYYFDVNGNMVADRMMILDGHTQYFFAGGSQAKDQFLIGSDGNLRYFDQSSGNMVTNR 1440

Lb. sakei MN1 FAVNRNGDWFYFNGDGIKLGWQTIAGKTYFFDADGRQVKAADKAAADKAAAEQAAADK 1500
Lb. sakei Kg15 FAVNRNGDWFYFNGDGIKLGWQTIAGKTYFFDADGRQVKAAD----- 1457
Lb. curvatus TMW1624 FAVNRNGDWFYFNGDGIKLGWQTIAGKTYFFDADGRQVKAADKAAAEQAAADKAAADK 1500
 *****;

Lb. sakei MN1 AAADKAAAEQAAADKAAADKAAAEQAAADKAAADKAAAEQAAADKAAADKAAAEQAAAEQ 1560
Lb. sakei Kg15 ----- 1540
Lb. curvatus TMW1624 AAADKAAAEQAAADKAAADKAAAEQAAADKAAAEQAAADK----- 1540

Lb. sakei MN1 AAADKAAAEQAAADKAAAEQAAADKAAADKAAAEQAAADKAAADKAAAEQAAAEQAAADK 1620
Lb. sakei Kg15 ----- 1550
Lb. curvatus TMW1624 -----AAAEQAAADK 1550

Lb. sakei MN1 AAAEQAAADKAAAEQAAADKAAAEQAAADKAAAKDKQTQAVAYATKAKNNIDQATTADG 1680
Lb. sakei Kg15 -----KAAAEQAAADKAAAEQAAADKAAAKDKQTQAVAYATKAKNNIDQATTADG 1508
Lb. curvatus TMW1624 AAAEQAAADKAAADKAAAEQAAAEQAAADKAAAKDKQTQAVAYATKAKNNIDQATTADG 1610
 ****:***:*****

Lb. sakei MN1 INDAQATGITDIDNQHVPGTSDVNQKQAEKVTEDIKNPDKNTLPEAIELPNTGVDKTES 1740
Lb. sakei Kg15 INDAQATGITDIDNQHVPGTSDVNKKQAEKVTEDIKNPDKNTLPEAIELPNTGVDKTES 1568
Lb. curvatus TMW1624 INDAQATGITDIDNQHVPGTSDVNQKQAEKVTEDIKNPDKNTLPEAIELPNTGVDKTES 1670
 *****;*****

Lb. sakei MN1 ITITGVVMLILTTIFGLLFTSKKHKKD 1767
Lb. sakei Kg15 ITITGVVMLILTTIFGLLFTSKKHKKD 1595
Lb. curvatus TMW1624 ITITGVVMLILTTIFGLLFTSKKHKKD 1697

Figure S4. Alignment (CLUSTALX 2.1) of the amino acid sequences of the dextranucrases of *Lb. sakei* MN1 (396-1395) and *Lb. reuteri* 180 3HZ3 (746-1751). Symbols: (*), identical amino acids in all sequences; (:), amino acids with very similar properties and (.), amino acids with low similarity.

```

Lb. sakei MN1      KTTYFD-KDGHLRKGYSTIIDNQLYYFDLKTGESVSTTTSNFKSGLTSQDDTTPHNSAV 59
Lb. reuteri 180   -QYYIDPTTGQPRKNFLLQNGNDWIYFDKDTGAGTNALKLQFDKGTISADEQYRRGNEAY 59
                  **:* . *: **: . *: *** .* . . . : : * . *

Lb. sakei MN1      NMSKDSFTTVDGFLTAESWYVPKDIQTSATDWRASTPEDFRPIMMTWWPTKQIQAAAYLNH 119
Lb. reuteri 180   SYDDKSIENVNGYLTAFTWYRKPQILKDGTTWTDSKETDMRPILMVVWPNTVTVQAYLLNY 119
                  . . . . *: . *: **: **: ** * . * . *: **: *: **. . ** ***:

Lb. sakei MN1      MVSEG--LLSSDKKFSATDDQTLNQAHAHVQLQIELKIQQTKSVEWLRTTMHNFIKSQP 177
Lb. reuteri 180   MKQYGNLLPASLPSFSTADSAELNHYSELVQQNIEKRISETGSTDWLRLTMHEFVTKNS 179
                  * . * * *: * **: . *: **: . . ** **: *: . *: * . : ** ** *: : . .

Lb. sakei MN1      GYNVTSETPSND--HLQGGALSYINSVLTDPDANSNFRMLNRRNPQQDGRHYNTDTSEGG 235
Lb. reuteri 180   MWNKDSENVVDYGGQLQGGFLKYVNSDLTKYANSWRLMNRATATNIDGK-----NYGG 232
                  : * ** . . . : ** ** *: ** ** ** *: : ** ** . *: ** . . **

Lb. sakei MN1      YELLANDVDNSNPVVQAEQLNWLFLTHFGEIVKNDPSANFDSVRVDAVDNVDADLLNI 295
Lb. reuteri 180   AEFLLANDIDNSNPVVQAEELNWLFLYLMNFGTITGNPEANFDGIRVDAVDNVDLLSI 292
                  *: ** ** : ** ** ** *: ** * . *: * . ** ** . : ** ** ** . ** . *

Lb. sakei MN1      TAAYFRDVYGVKNDLNTANQHLSILEDWGHNDPLYVKDHGSDQLTMDDMYHTQLIWSLTK 355
Lb. reuteri 180   ARDYFNAAYNMEQSDASANKHINILEDWGDDPAYVVKIGNPQLTMDRLRINAIMDTLSG 352
                  : ** . * . : . . . : ** **: . ** ** : ** * ** . * . ** ** . : . : : * :

Lb. sakei MN1      NPDNRSAMRRFMEYYLVDRAKDNTSDQAI PNYSFVRAHDSEVQTVIGDIVAKLYPDVKNS 415
Lb. reuteri 180   APDKNQALNKLITQSLVNRANDNTENAVIPSYNFVRAHDSNAQDQIRQAIQAATGKPYGE 412
                  ** : . * : . : . : ** : ** : ** : . ** . * . ** ** : * * : : . .

Lb. sakei MN1      LAPSMEQLAAAFKVDADMNVSNNKYTYQNMPPAAYAMLLTNKDTIPRVYGDYMTDDGQY 475
Lb. reuteri 180   FN--LDDEKKGMEAYINDQNSTNKKWNLNMP SAYTILLTNKDSVPRVYGGDYQDGGQY 470
                  : : : . : . . * * ** : ** : . ** ** : ** ** : ** ** : ** ** : * * **

Lb. sakei MN1      MATKSPYYDAISALLKARIKYVAGGQTMVAVDKHDILTSVRFVGDGIMNASDKGSTTARTQG 535
Lb. reuteri 180   MEHKTRYFDTIINLLKTRVKYVAGGQTMVAVDKHILTNVRFVGDGAMNATDTGTDETRTEG 530
                  * * : * : ** : ** : ** : ** : ** : ** : ** : ** : ** : ** : ** : ** :

Lb. sakei MN1      IGVIVSNNDALALK-GDVTTLHMGIAHANQAYRALLLTDDGLMKYTSDNQAPIRYTDAN 594
Lb. reuteri 180   IGVVISNNTNLKLNLDGESVVLHMGAAHKNQKYRAVILTEDGVKNYNTNDTAPVAYTDAN 590
                  ** *: ** * * * : * : ** ** ** ** ** ** ** ** ** * ** : ** * ** : ** * . ** : ** **

Lb. sakei MN1      GDLIFTSADIKG-----YQNVEVSGFLSVVWPVGASDTQDARATGSSAANKTGDTLH 646
Lb. reuteri 180   GDLHFTNTNLDGQQYTAVRGYANPDVTGYLAVVWPAGAADDQDARTAPSDEAHTTKTAYR 650
                  ** * . : . : * * * : ** : ** : ** : ** : ** : ** : * . * . * : :

Lb. sakei MN1      SNAALDSNVIYEGFSNFQEMPTTHDEFNTVKIAQNADLFKSWGVTFSQLAPQYRSSDDTS 706
Lb. reuteri 180   SNAALDSNVIYEGFSNFIYWPPTESERTNVRIAQNADLFKSWGITTFELAPQYNSKDG 710
                  ** ** ** ** ** ** ** ** * ** . * ** : ** ** ** : ** : ** ** . ** . * :

Lb. sakei MN1      FLDSIIKNGYAFTDRYDLGFNTPTKYGDVDDLADAIRAMHSVGIQVMDFVPDQIYNLPG 766
Lb. reuteri 180   FLDSIIDNGYAFTDRYDLGMSTPNKYGSDEDLRNALQALHKAGLQAIADWVPDQIYNLPG 770
                  ** ** . ** ** ** : ** . ** . : ** : ** : ** : ** : ** : ** : ** :

Lb. sakei MN1      QEVVAVNRTNNGFTPNQSDLNQQLYVNTNSKGGGEYQAKYGGEFLLDLRLEHPDLFTTNQ 826
Lb. reuteri 180   KEAVTVTRSDDHGTTWEVSPKNNVYITNTIGGGEYQKKGGEFLDTLQKEYPQLFSQVY 830
                  : * . ** . * : . : ** . : * : * : ** : ** : ** : ** : ** : * : * : ** :

Lb. sakei MN1      ISTGVPIDGSTKIKEWSAKYFNGSDIQGKGADYVLKDGASQEYFKITSNANDESFLPKQF 886
Lb. reuteri 180   PVTQTTIDPSVKIKEWSAKYFNGTNIHRGAGYVLRSDGKYYNLGTSG--TQQFLPSQL 887
                  * . ** * . ** ** ** : ** : ** : ** : . : * ** : . ** . * :

Lb. sakei MN1      MNQD-AMTGFTTDEKGTYYSTSGYQAKQSFIQDGGQYYYFDADGYMVTG----SQTIN 941
Lb. reuteri 180   SVQDNEGYGFVKEGNNYHYDENKQMVKDAFIQDSVGNWYFDKNGNMVANQSPVEISSN 947
                  ** ** . : . : ** . . . *: ** . . *: ** : * ** . . : : *

Lb. sakei MN1      GKQ--YYFLPNGVELREAFQNASGNTVYVGKTSAVKSKYVVDQSGVAYYFDVNGNMVA 999
Lb. reuteri 180   GASGTYLFLNNGTSFRSGLVKTDAG-TYYDGDGRMVRNQTVSDG-AMTYVLDENGLVLS 1005
                  * . * ** * . : . : . : . : * * ** . * *: : * * . : ** : * ** : * :

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Lb. sakei MN1
Lb. reuteri 180

D 1000
E 1006
: