

Sequence listing

<110> UNIVERSITY-INDUSTRY COOPERATION GROUP OF KYUNG HEE UNIVERSITY
NAVIPHARM CO, LTD

<120> Novel lactic acid bacteria and use thereof

<130> SP101995SGM

<160> 38

<170> KoPatentIn 3.0

<210> 1
<211> 1490
<212> DNA
<213> Artificial Sequence

<220>
<223> NK33 16S rDNA

<400> 1

tatggctcag gatgaacgcc ggcggtgtgc ctaatacatg caagtcgtac gcactggccc	60
aactgattga tgggtgcttgc acctgattga cgatggatca ccagtgagtg gcggacgggt	120
gagtaacacg taggtaacct gccccggagc gggggataac atttggaaac agatgcta	180
accgcataac aacaaaagcc acatggcttt tgtttgaaag atggcttttg ctatcactct	240
gggatggacc tgcggtgcat tagctagttg gtaaggtaac ggcttaccaa ggcgatgatg	300
catagccgag ttgagagact gatcggccac aatggaactg agacacggtc catactccta	360
cgggaggcag cagtagggaa tcttccacaa tgggcgcaag cctgatggag caacaccgcg	420
tgagtgaaga agggtttcgg ctcgtaaagc tctgttggtg gagaagaacg tgcgtgagag	480
taactgttca cgcagtgcg gtatccaacc agaaagtcac ggctaactac gtgccagcag	540
ccgcggtaat acgtaggtgg caagcgttat ccggatttat tgggcgtaaa gcgagcgag	600
gcggttgctt aggtctgatg tgaaagcctt cggttaacc gaagaagtgc atcggaaacc	660
gggcgacttg agtgcagaag aggacagtgg aactccatgt gtagcggtagg aatgcgtaga	720
tatatggaag aacaccagtg gcgaaggcgg ctgtctggtc tgcaactgac gctgaggctc	780
gaaagcatgg gtagcgaaca ggattagata ccctggtagt ccatgccgta aacgatgagt	840
gctaggtgtt ggagggtttc cgcccttcag tgccggagct aacgcattaa gcactccgcc	900
tggggagtac gaccgcaagg ttgaaactca aaggaattga cgggggccc cacaagcgg	960
ggagcatgtg gtttaattcg aagctacgcg aagaacctta ccaggtcttg acatcttgcg	1020

ctaaccttag agataaggcg ttcccttcgg ggacgcaatg acaggtgggtg catggtcgtc	1080
gtcagctcgt gtcgtgagat gttgggttaa gtcccgaac gagcgcaacc cttgttacta	1140
gttgccagca ttaagttggg cactctagtg agactgccgg tgacaaaccg gaggaagggtg	1200
gggacgacgt cagatcatca tgccccttat gacctgggct acacacgtgc tacaatggac	1260
ggtacaacga gtcgaagct cgcgagagta agctaatttc ttaaagccgt tctcagttcg	1320
gactgtaggc tgcaactcgc ctacacgaag tcggaatcgc tagtaatcgc ggatcagcat	1380
gccgcggtga atacgttccc gggccttgta cacaccgcc gtcacaccat ggggagtttg	1440
taacgccccaa agtcggtggc ctaaccttta tggagggagc cgcctaaggc	1490

<210> 2
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Firmicutes F_primer

<400> 2	
ggagyatgtg gtttaattcg aagca	25

<210> 3
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Firmicutes R_primer

<400> 3	
agctgacgac aaccatgcac	20

<210> 4
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Bacteroidetes F_primer

<400> 4

gtttaattcg atgatacgcg ag 22

<210> 5
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Bacteroidetes R_primer

<400> 5
ttaasccgac acctcacgg 19

<210> 6
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> beta-Proteobacteria F_primer

<400> 6
aacgcgaaaa accttaccta cc 22

<210> 7
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> beta-Proteobacteria R_primer

<400> 7
tgccctttcg tagcaactag tg 22

<210> 8
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> delta/gamma-Proteobacteria F_primer

<400> 8
gctaacgcat taagtryccc g 21

<210>	9	
<211>	18	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	delta/gamma-Proteobacteria R_primer	
<400>	9	
	gccatgcrgc acctgtct	18
<210>	10	
<211>	22	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	epsilon-Proteobacteria F_primer	
<400>	10	
	taggcttgac attgatagaa tc	22
<210>	11	
<211>	21	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	epsilon-Proteobacteria R_primer	
<400>	11	
	cttacgaagg cagtctcctt a	21
<210>	12	
<211>	18	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Actinobacteria F_primer	
<400>	12	
	tgtacggtg gaatgcgc	18
<210>	13	

<211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Actinobacteria R_primer

<400> 13
 aattaagcca catgctccgc t 21

<210> 14
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> TM F_primer

<400> 14
 aytgggcgta aagagttgc 19

<210> 15
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> TM R_primer

<400> 15
 tacggytacc ttgttacgac tt 22

<210> 16
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Verrucomicrobia F_primer

<400> 16
 tcakgtcagt atggccctta t 21

<210> 17
 <211> 23
 <212> DNA

<213>	Artificial Sequence	
<220>		
<223>	Verrucomicrobia R_primer	
<400>	17	
	cagttttyag gatttcctcc gcc	23
<210>	18	
<211>	25	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Enterobacteriaceae F_primer	
<400>	18	
	cattgacgtt acccgagaa gaagc	25
<210>	19	
<211>	21	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Enterobacteriaceae R_primer	
<400>	19	
	ctctacgaga ctcaagcttg c	21
<210>	20	
<211>	24	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Escherichia coli F_primer	
<400>	20	
	cgcgactat acgcatgaa cgta	24
<210>	21	
<211>	22	
<212>	DNA	
<213>	Artificial Sequence	

<220>
<223> Escherichia coli R_primer

<400> 21
accgttgatc acttcggtca gg 22

<210> 22
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Klebsiella spp. F_primer

<400> 22
gatacggagt atgcctttac ggtg 24

<210> 23
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Klebsiella spp. R_primer

<400> 23
tagcctttat caagcggata ctgg 24

<210> 24
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Klebsiella oxytoca F_primer

<400> 24
gttaatacct ttgctcattg a 21

<210> 25
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Klebsiella oxytoca R_primer

<400> 25
accagggtat ctaatcctgt t 21

<210> 26
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Morganella morganii F_primer

<400> 26
ctcgccacat cagatgaacc catat 25

<210> 27
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Morganella morganii R_primer

<400> 27
caaagcatct ctgctaagtt ctctggatg 29

<210> 28
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Lactobacillus reuteri F_primer

<400> 28
gaacgcaytg gcccaa 16

<210> 29
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Lactobacillus reuteri R_primer

<400>	29	
tccattgtgg	ccgatcagt	19
<210>	30	
<211>	20	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Lactobacillus johnsonii F_primer	
<400>	30	
cactagacgc	atgtctagag	20
<210>	31	
<211>	20	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Lactobacillus johnsonii R_primer	
<400>	31	
agtctctcaa	ctcggctatg	20
<210>	32	
<211>	20	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Lactobacillus plantarum F_primer	
<400>	32	
tcatgattta	catttgagtg	20
<210>	33	
<211>	21	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Lactobacillus plantarum R_primer	
<400>	33	
gaccatgcgg	tccaagttgt t	21

<210>	34	
<211>	20	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Lactobacillus rhamnosus F_primer	
<400>	34	
	cgcccttaac agcagtcttc	20
<210>	35	
<211>	20	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Lactobacillus rhamnosus R_primer	
<400>	35	
	gcccttcgta tgcttaaacc	20
<210>	36	
<211>	52	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Bacterial 16S rDNA F_primer	
<400>	36	
	tcgtcggcag cgtcagatgt gtataagaga caggtgccag cmgccgcggt aa	52
<210>	37	
<211>	54	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Bacterial 16S rDNA R_primer	
<400>	37	
	gtctcgtggg ctcggagatg tgtataagag acagggacta chvgggtwtc taat	54

<210> 38
 <211> 1460
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> NK98 16S rDNA

<400> 38
 ctccaggatga acgctggcgg cgtgcttaac acatgcaagt cgaacgggat cccaggagct 60
 tgctcctggg tgagagtggc gaacgggtga gtaatgctg accgacctgc cccatacacc 120
 ggaatagctc ctggaaacgg gtggtaatgc cggatgctcc agttggatgc atgtccttct 180
 gggaaagatt catcggtatg ggatggggtc gcgtcctatc agcttgatgg cggggtaacg 240
 gcccaccatg gcttcgacgg gtagccggcc tgagagggcg accggccaca ttgggactga 300
 gatacggccc agactcctac gggaggcagc agtggggaat attgcacaat gggcgcaagc 360
 ctgatgcagc gacgccgct gcgggatgac ggccttcggg ttgtaaaccg cttttgactg 420
 ggagcaagcc cttcgggggtg agtgtacctt tcgaataagc accggctaac tacgtgccag 480
 cagccgcggt aatacgtagg gtgcaagcgt tatccggaat tattgggcgt aaagggctcg 540
 taggcggttc gtcgctccg gtgtgaaagt ccatcgctta acgggtggatc cgcgccgggt 600
 acgggagggc ttgagtgcgg taggggagac tggaattccc ggtgtaacgg tggaatgtgt 660
 agatatcggg aagaacacca atggcgaagg caggtctctg ggccgtcact gacgtgagg 720
 agcgaagcg tggggagcga acaggattag ataccctggg agtccacgc gtaaaccggtg 780
 gatgctggat gtggggacca ttccacggtc tccgtgtcgg agccaacgcg ttaagcatcc 840
 cgcctgggga gtacggccgc aaggctaaaa ctcaaagaaa ttgacggggg cccgcacaag 900
 cggcggagca tgcggattaa ttcgatgcaa cgcgaagaac cttacctggg cttgacatgt 960
 tcccacagc cccagagatg gggcctccct tcggggcggg ttcacagggtg gtgcatggtc 1020
 gtcgtcagct cgtgtcgtga gatgttgggt taagtcccgc aacgagcgca accctcgccc 1080
 tgtgttgcca gcacgtcgtg gtgggaactc acgggggacc gccgggtca actcgaggga 1140
 aggtggggat gacgtcagat catcatgccc cttacgtcca gggcttcacg catgctacaa 1200
 tggccggtac aacgggatgc gacactgtga ggtggagcgg atcccttaaa accggtctca 1260
 gttcggattg gagtctgcaa cccgactcca tgaaggcggg gtcgctagta atcgcggatc 1320

agcaacgccg cggatgaatgc gttcccgggc cttgtacaca ccgcccgtca agtcatgaaa	1380
gtgggtagca cccgaagccg gtggcccaac ctttttgggg ggagccgtct aaggtgagac	1440
tcgtgattgg gactaatcta	1460