

15477SG41_Sequence Listing
SEQUENCE LISTING

<110> Heartseed Inc.
 <120> Method for Producing High-quality iPSCs
 <130> 2016C9493
 <150> JP 2015-138645
 <151> 2015-07-10
 <160> 60
 <170> PatentIn version 3.1
 <210> 1
 <211> 624
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <223> Inventor:YUASA, Shinsuke; FUKUDA, Keiichi; KUNITOMI, Akira

<400> 1
 atggcccccg cgacggctcc caggagagcg ggtgaggcca aggggaaggg cccaagaaa 60
 ccaagtgagg ccaaggagga ccctcccaac gtgggcaagg tgaaaaaggc agccaagagg 120
 ccagcaaagg tgcagaagcc tcctcccaag ccaggcgag ccacagagaa ggctcgcaag 180
 caaggcggcg cgccaagga caccagggca cagtcgggag aggctaggaa ggtgcccccc 240
 aagccagaca aggcattgcg ggcaccttcc agtgctggtg ggctcagcag gaaggcaaag 300
 gccaaaggca gcaggagcag ccaaggagat gctgaggcct acaggaaaac caaagctgag 360
 agtaagagtt caaaaccac ggccagcaag gtcaagaatg gtgctgcttc cccgacaaaa 420
 aagaagggtg tgccaaggc caaggcccct aaagctgggc aggggccaaa caccaaggct 480
 gctgctcctg ctaagggcag tgggtccaag gtggtacctg cacatttgtc caggaagaca 540
 gaggccccca agggccctag aaaggctggg ctgcccacatc aggcctcatc atccaaagtg 600
 tccagccaga gggctgaagc ttag 624

<210> 2
 <211> 207
 <212> PRT
 <213> Homo sapiens

<400> 2
 Met Ala Pro Ala Thr Ala Pro Arg Arg Ala Gly Glu Ala Lys Gly Lys
 1 5 10 15
 Gly Pro Lys Lys Pro Ser Glu Ala Lys Glu Asp Pro Pro Asn Val Gly
 20 25 30

15477SG41_Sequence Listing

Lys Val Lys Lys Ala Ala Lys Arg Pro Ala Lys Val Gln Lys Pro Pro
 35 40 45
 Pro Lys Pro Gly Ala Ala Thr Glu Lys Ala Arg Lys Gln Gly Gly Ala
 50 55 60
 Ala Lys Asp Thr Arg Ala Gln Ser Gly Glu Ala Arg Lys Val Pro Pro
 65 70 75 80
 Lys Pro Asp Lys Ala Met Arg Ala Pro Ser Ser Ala Gly Gly Leu Ser
 85 90 95
 Arg Lys Ala Lys Ala Lys Gly Ser Arg Ser Ser Gln Gly Asp Ala Glu
 100 105 110
 Ala Tyr Arg Lys Thr Lys Ala Glu Ser Lys Ser Ser Lys Pro Thr Ala
 115 120 125
 Ser Lys Val Lys Asn Gly Ala Ala Ser Pro Thr Lys Lys Lys Val Val
 130 135 140
 Ala Lys Ala Lys Ala Pro Lys Ala Gly Gln Gly Pro Asn Thr Lys Ala
 145 150 155 160
 Ala Ala Pro Ala Lys Gly Ser Gly Ser Lys Val Val Pro Ala His Leu
 165 170 175
 Ser Arg Lys Thr Glu Ala Pro Lys Gly Pro Arg Lys Ala Gly Leu Pro
 180 185 190
 Ile Lys Ala Ser Ser Ser Lys Val Ser Ser Gln Arg Ala Glu Ala
 195 200 205

<210> 3
 <211> 915
 <212> DNA
 <213> Mus musculus

<400> 3
 atggctcctg ggagtgtctc cagtgtttct tcctcctctt ttccctccag ggacacatcc 60
 ccttctggat catgtgggct ccctggagct gacaagccag gtccaagttg cgcagaatc 120
 caagcaggcc aaaggaaccc aacaatgctg cacatggtgc tagaggcttt gaaggcccgg 180
 gaggcacgcc agggcacatc agttgtagcc atcaaggctc acatccaaca caagtaccg 240
 acagtggaca ccacccgttt caagtacctg ttgaagcaag ctctggaaac tggcgttcgt 300
 cgaggcctcc tcaccaggcc tgctcactcc aaggccaagg gtgccactgg cagcttcaaa 360

15477SG41_Sequence Listing

ctagttccaa agcccaagac aaagaaagcc tgtgccccca aagccggcag gggagctgca	420
ggtgccaagg agacaggctc caagaaatct ggattgctga agaaagacca agttggcaag	480
gccacgatgg agaaagggca gaagaggagg gcttaccctt gcaaggcagc cacactggag	540
atggcaccta agaaagccaa ggcgaaaccg aaagagggtca gaaagggtcc cctaaaacaa	600
gacaaagcag caggggcccc tctgactgcc aatggaggcc agaagggtcaa acgcagtggg	660
agcaggcaag aagcaaatgc ccatgggaaa accaaagggtg agaaatcgaa gcccttggcc	720
agcaagggtcc agaatagcgt tgcttccctc gccaaaagga agatggcaga catggcccac	780
actgtgacag ttgttcaggg ggctgagaca gtacaggaga ccaaagtgcc cactccttcc	840
caggacatag gacacaaagt acaaccata cctagggtca ggaaggcaaa gaccctgag	900
aacactcagg cctga	915

<210> 4
 <211> 304
 <212> PRT
 <213> Mus musculus

<400> 4

Met	Ala	Pro	Gly	Ser	Val	Ser	Ser	Val	Ser	Ser	Ser	Ser	Phe	Pro	Ser
1				5					10					15	

Arg	Asp	Thr	Ser	Pro	Ser	Gly	Ser	Cys	Gly	Leu	Pro	Gly	Ala	Asp	Lys
			20					25					30		

Pro	Gly	Pro	Ser	Cys	Arg	Arg	Ile	Gln	Ala	Gly	Gln	Arg	Asn	Pro	Thr
		35					40					45			

Met	Leu	His	Met	Val	Leu	Glu	Ala	Leu	Lys	Ala	Arg	Glu	Ala	Arg	Gln
	50					55					60				

Gly	Thr	Ser	Val	Val	Ala	Ile	Lys	Val	Tyr	Ile	Gln	His	Lys	Tyr	Pro
65					70					75					80

Thr	Val	Asp	Thr	Thr	Arg	Phe	Lys	Tyr	Leu	Leu	Lys	Gln	Ala	Leu	Glu
				85					90					95	

Thr	Gly	Val	Arg	Arg	Gly	Leu	Leu	Thr	Arg	Pro	Ala	His	Ser	Lys	Ala
			100					105					110		

Lys	Gly	Ala	Thr	Gly	Ser	Phe	Lys	Leu	Val	Pro	Lys	Pro	Lys	Thr	Lys
		115					120					125			

Lys	Ala	Cys	Ala	Pro	Lys	Ala	Gly	Arg	Gly	Ala	Ala	Gly	Ala	Lys	Glu
	130					135					140				

15477SG41_Sequence Listing

Thr Gly Ser Lys Lys Ser Gly Leu Leu Lys Lys Asp Gln Val Gly Lys
145 150 155 160

Ala Thr Met Glu Lys Gly Gln Lys Arg Arg Ala Tyr Pro Cys Lys Ala
165 170 175

Ala Thr Leu Glu Met Ala Pro Lys Lys Ala Lys Ala Lys Pro Lys Glu
180 185 190

Val Arg Lys Ala Pro Leu Lys Gln Asp Lys Ala Ala Gly Ala Pro Leu
195 200 205

Thr Ala Asn Gly Gly Gln Lys Val Lys Arg Ser Gly Ser Arg Gln Glu
210 215 220

Ala Asn Ala His Gly Lys Thr Lys Gly Glu Lys Ser Lys Pro Leu Ala
225 230 235 240

Ser Lys Val Gln Asn Ser Val Ala Ser Leu Ala Lys Arg Lys Met Ala
245 250 255

Asp Met Ala His Thr Val Thr Val Val Gln Gly Ala Glu Thr Val Gln
260 265 270

Glu Thr Lys Val Pro Thr Pro Ser Gln Asp Ile Gly His Lys Val Gln
275 280 285

Pro Ile Pro Arg Val Arg Lys Ala Lys Thr Pro Glu Asn Thr Gln Ala
290 295 300

<210> 5
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Nanog-F

<400> 5
agggtctgct actgagatgc t

21

<210> 6
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Nanog-R

<400> 6
caacacctgg tttttctgcc accg

24

15477SG41_Sequence Listing

<210>	7	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	endogenous Oct3/4-F	
<400>	7	
	tctttccacc aggccccgg ctc	23
<210>	8	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	endogenous Oct3/4-R	
<400>	8	
	tgcgggcgga catggggaga tcc	23
<210>	9	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	endogenous Sox2-F	
<400>	9	
	tagagataga ctccgggcga tga	23
<210>	10	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	endogenous Sox2-R	
<400>	10	
	ttgccttaaa caagaccacg aaa	23
<210>	11	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	exogenous Oct3/4-F	
<400>	11	
	ccccagggcc ccatttttgt acc	23
<210>	12	

15477SG41_Sequence Listing

<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	exogenous Oct3/4-R	
<400>	12	
	cccttttttct ggagactaat aaa	23
<210>	13	
<211>	26	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	exogenous Sox2-F	
<400>	13	
	ggcacccttg gcatggctct tggctc	26
<210>	14	
<211>	24	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	exogenous Sox2-R	
<400>	14	
	ttatcgtcga ccactgtgct gctg	24
<210>	15	
<211>	24	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Rex1-F	
<400>	15	
	acgagtggca gtttcttctt ggga	24
<210>	16	
<211>	24	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Rex1-R	
<400>	16	
	tatgactcac ttccaggggg cact	24
<210>	17	
<211>	20	
<212>	DNA	
<213>	Artificial	

15477SG41_Sequence Listing

<220>		
<223>	Sal14-F	
<400>	17	
	ccctgggaac tgcgatgaag	20
<210>	18	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Sal14-R	
<400>	18	
	tcagagagac taaagaactc ggc	23
<210>	19	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	H1foo-F	
<400>	19	
	ggcacaggct ttctttgtct	20
<210>	20	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	H1foo-R	
<400>	20	
	tccaacacaa gtacccgaca	20
<210>	21	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Foxa2-F	
<400>	21	
	agcaccatta cgccttcaac	20
<210>	22	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Foxa2-R	

15477SG41_Sequence Listing

<400> 22		
ccttgaggtc cattttgtgg		20
<210> 23		
<211> 20		
<212> DNA		
<213> Artificial		
<220>		
<223> Cxcr4-F		
<400> 23		
cgggatgaaa acgtccattt		20
<210> 24		
<211> 21		
<212> DNA		
<213> Artificial		
<220>		
<223> Cxcr4-R		
<400> 24		
atgaccagga tcaccaatcc a		21
<210> 25		
<211> 22		
<212> DNA		
<213> Artificial		
<220>		
<223> Col6a2-F		
<400> 25		
ccaccactga aaggaacaac aa		22
<210> 26		
<211> 23		
<212> DNA		
<213> Artificial		
<220>		
<223> Col6a2-R		
<400> 26		
tccaacacga aatacacgtt gac		23
<210> 27		
<211> 20		
<212> DNA		
<213> Artificial		
<220>		
<223> T-F		
<400> 27		
tgtcctccct tgttgcctta		20

15477SG41_Sequence Listing

<210>	28	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	T-R	
<400>	28	
	atgttccaag ggcagaacag	20
<210>	29	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	beta3-Tubulin-F	
<400>	29	
	cccagcggca actatgtagg	20
<210>	30	
<211>	19	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	beta3-Tubulin-R	
<400>	30	
	ccagaccgaa cactgtcca	19
<210>	31	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Tubb3-F	
<400>	31	
	ccaaatctac ccaccaagga	20
<210>	32	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Tubb3-R	
<400>	32	
	agagcttcca gaacgtcgag	20
<210>	33	

15477SG41_Sequence Listing

<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Ki67-F	
<400>	33	
	tctgatgtta ggtgtttgag	20
<210>	34	
<211>	21	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Ki67-R	
<400>	34	
	cacttttctg gtaacttctt g	21
<210>	35	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	PCNA-F	
<400>	35	
	taaagaagag gaggcggtaa	20
<210>	36	
<211>	20	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	PCNA-R	
<400>	36	
	taagtggtccc atgtcagcaa	20
<210>	37	
<211>	19	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	GAPDH-F	
<400>	37	
	ttcaacggca cagtcaagg	19
<210>	38	
<211>	19	
<212>	DNA	
<213>	Artificial	

15477SG41_Sequence Listing

<220>		
<223>	GAPDH-R	
<400>	38	
	catggactgt ggtcatgag	19
<210>	39	
<211>	24	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Oct3/4-DMR-F	
<400>	39	
	ggtttttttag aggatggttg agtg	24
<210>	40	
<211>	23	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Oct3/4-DMR-R	
<400>	40	
	tccaacccta ctaacccatc acc	23
<210>	41	
<211>	30	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Nanog-DMR-F	
<400>	41	
	gattttttag gtgggattaa ttgtgaattt	30
<210>	42	
<211>	30	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	Nanog-DMR-R	
<400>	42	
	accaaaaaaaaa cccacactca tatcaatata	30
<210>	43	
<211>	22	
<212>	DNA	
<213>	Artificial	
<220>		
<223>	IG-DMR-F	

15477SG41_Sequence Listing

<400> 43		
gtggtttggtt atgggtaagt tt		22
<210> 44		
<211> 24		
<212> DNA		
<213> Artificial		
<220>		
<223> IG-DMR-R		
<400> 44		
cccttccctc actccaaaaa ttaa		24
<210> 45		
<211> 28		
<212> DNA		
<213> Artificial		
<220>		
<223> Gt12-DMR-F		
<400> 45		
agttattttt tgtttgaaag gatgtgta		28
<210> 46		
<211> 28		
<212> DNA		
<213> Artificial		
<220>		
<223> Gt12-DMR-R		
<400> 46		
ctaactttaa aaaaaaatcc ccaacact		28
<210> 47		
<211> 1083		
<212> DNA		
<213> Homo sapiens		
<400> 47		
atggcgggac acctggcttc ggatttcgcc ttctcgcccc ctccaggtgg tggaggtgat	60	
gggccagggg ggccggagcc gggctgggtt gatcctcgga cctggctaag cttccaaggc	120	
cctcctggag ggccaggaat cgggccgggg gttgggccag gctctgaggt gtgggggatt	180	
cccccatgcc ccccgccgta tgagtctgt ggggggatgg cgtactgtgg gccccagggt	240	
ggagtggggc tagtgcccca aggcggcttg gagacctctc agcctgaggg cgaagcagga	300	
gtcgggggtg agagcaactc cgatggggcc tccccggagc cctgcaccgt caccctggt	360	
gccgtgaagc tggagaagga gaagctggag caaaacccgg aggagtccca ggacatcaaa	420	
gctctgcaga aagaactcga gcaatttgcc aagctcctga agcagaagag gatcacctg	480	

15477SG41_Sequence Listing

ggatatacac aggccgatgt ggggctcacc ctgggggttc tatttgggaa ggtattcagc 540
 caaacgacca tctgccgctt tgaggctctg cagcttagct tcaagaacat gtgtaagctg 600
 cggcccttgc tgcagaagtg ggtggaggaa gctgacaaca atgaaaatct tcaggagata 660
 tgcaaagcag aaaccctcgt gcaggcccga aagagaaaagc gaaccagtat cgagaaccga 720
 gtgagaggca acctggagaa tttgttcctg cagtgtcccga aaccacact gcagcagatc 780
 agccacatcg cccagcagct tgggctcgag aaggatgtgg tccgagtgtg gttctgtaac 840
 cggcgccaga agggcaagcg atcaagcagc gactatgcac aacgagagga ttttgaggct 900
 gctgggtctc ctttctcagg gggaccagtg tcctttcctc tggccccagg gccccatttt 960
 ggtaccccag gctatgggag ccttcacttc actgcactgt actcctcggg ccttttcctt 1020
 gagggggaag cctttccccc tgtctccgtc accactctgg gctctcccat gcattcaaac 1080
 tga 1083

<210> 48
 <211> 360
 <212> PRT
 <213> Homo sapiens
 <400> 48

Met Ala Gly His Leu Ala Ser Asp Phe Ala Phe Ser Pro Pro Pro Gly
 1 5 10 15

Gly Gly Gly Asp Gly Pro Gly Gly Pro Glu Pro Gly Trp Val Asp Pro
 20 25 30

Arg Thr Trp Leu Ser Phe Gln Gly Pro Pro Gly Gly Pro Gly Ile Gly
 35 40 45

Pro Gly Val Gly Pro Gly Ser Glu Val Trp Gly Ile Pro Pro Cys Pro
 50 55 60

Pro Pro Tyr Glu Phe Cys Gly Gly Met Ala Tyr Cys Gly Pro Gln Val
 65 70 75 80

Gly Val Gly Leu Val Pro Gln Gly Gly Leu Glu Thr Ser Gln Pro Glu
 85 90 95

Gly Glu Ala Gly Val Gly Val Glu Ser Asn Ser Asp Gly Ala Ser Pro
 100 105 110

Glu Pro Cys Thr Val Thr Pro Gly Ala Val Lys Leu Glu Lys Glu Lys
 115 120 125

Leu Glu Gln Asn Pro Glu Glu Ser Gln Asp Ile Lys Ala Leu Gln Lys

15477SG41_Sequence Listing

130

135

140

Glu Leu Glu Gln Phe Ala Lys Leu Leu Lys Gln Lys Arg Ile Thr Leu
145 150 155 160

Gly Tyr Thr Gln Ala Asp Val Gly Leu Thr Leu Gly Val Leu Phe Gly
165 170 175

Lys Val Phe Ser Gln Thr Thr Ile Cys Arg Phe Glu Ala Leu Gln Leu
180 185 190

Ser Phe Lys Asn Met Cys Lys Leu Arg Pro Leu Leu Gln Lys Trp Val
195 200 205

Glu Glu Ala Asp Asn Asn Glu Asn Leu Gln Glu Ile Cys Lys Ala Glu
210 215 220

Thr Leu Val Gln Ala Arg Lys Arg Lys Arg Thr Ser Ile Glu Asn Arg
225 230 235 240

Val Arg Gly Asn Leu Glu Asn Leu Phe Leu Gln Cys Pro Lys Pro Thr
245 250 255

Leu Gln Gln Ile Ser His Ile Ala Gln Gln Leu Gly Leu Glu Lys Asp
260 265 270

Val Val Arg Val Trp Phe Cys Asn Arg Arg Gln Lys Gly Lys Arg Ser
275 280 285

Ser Ser Asp Tyr Ala Gln Arg Glu Asp Phe Glu Ala Ala Gly Ser Pro
290 295 300

Phe Ser Gly Gly Pro Val Ser Phe Pro Leu Ala Pro Gly Pro His Phe
305 310 315 320

Gly Thr Pro Gly Tyr Gly Ser Pro His Phe Thr Ala Leu Tyr Ser Ser
325 330 335

Val Pro Phe Pro Glu Gly Glu Ala Phe Pro Pro Val Ser Val Thr Thr
340 345 350

Leu Gly Ser Pro Met His Ser Asn
355 360

<210> 49
<211> 954
<212> DNA
<213> Homo sapiens

15477SG41_Sequence Listing

```

<400> 49
atgtacaaca tgatggagac ggagctgaag ccgccgggcc cgcagcaaac ttcggggggc 60
ggcggcgcca actccaccgc ggcggcggcc ggcggcaacc agaaaaacag cccggaccgc 120
gtcaagcggc ccatgaatgc cttcatggtg tggccccgcg ggcagcggcg caagatggcc 180
caggagaacc ccaagatgca caactcggag atcagcaagc gcctgggagc cgagtggaaa 240
cttttgtcgg agacggagaa gcggccgttc atcgacgagg ctaagcggct gcgagcgtg 300
cacatgaagg agcaccgcga ttataaatac cggccccggc ggaaaaccaa gacgctcatg 360
aagaaggata agtacacgct gcccggcggg ctgctggccc ccggcggcaa tagcatggcg 420
agcgggggtcg ggggtgggagc cggcctgggc gcgggcgtga accagcgcac ggacagttac 480
gcgcacatga acggctggag caacggcagc tacagcatga tgcaggacca gctgggctac 540
ccgcagcacc cgggacctca tgcgcacggc gcagcgcaga tgcagcccat gcaccgctac 600
gacgtgagcg ccctgcagta caactccatg accagctcgc agacctacat gaacggctcg 660
cccacctaca gcatgtccta ctcgcagcag ggcacccctg gcatggctct tggctccatg 720
ggttcggtgg tcaagtccga ggccagctcc agccccctg tggttacctc ttcctccac 780
tccagggcgc cctgccaggc cggggacctc cgggacatga tcagcatgta tctccccggc 840
gccgaggtgc cggaacccgc cgccccagc agacttcaca tgtcccagca ctaccagagc 900
ggcccgggtgc ccggcacggc cattaacggc aactgcccc tctcacacat gtga 954

```

```

<210> 50
<211> 317
<212> PRT
<213> Homo sapiens

```

<400> 50

```

Met Tyr Asn Met Met Glu Thr Glu Leu Lys Pro Pro Gly Pro Gln Gln
1          5          10          15

```

```

Thr Ser Gly Gly Gly Gly Gly Asn Ser Thr Ala Ala Ala Ala Gly Gly
20          25          30

```

```

Asn Gln Lys Asn Ser Pro Asp Arg Val Lys Arg Pro Met Asn Ala Phe
35          40          45

```

```

Met Val Trp Ser Arg Gly Gln Arg Arg Lys Met Ala Gln Glu Asn Pro
50          55          60

```

```

Lys Met His Asn Ser Glu Ile Ser Lys Arg Leu Gly Ala Glu Trp Lys
65          70          75          80

```

```

Leu Leu Ser Glu Thr Glu Lys Arg Pro Phe Ile Asp Glu Ala Lys Arg

```

15477SG41_Sequence Listing

85

90

95

Leu Arg Ala Leu His Met Lys Glu His Pro Asp Tyr Lys Tyr Arg Pro
100 105 110

Arg Arg Lys Thr Lys Thr Leu Met Lys Lys Asp Lys Tyr Thr Leu Pro
115 120 125

Gly Gly Leu Leu Ala Pro Gly Gly Asn Ser Met Ala Ser Gly Val Gly
130 135 140

Val Gly Ala Gly Leu Gly Ala Gly Val Asn Gln Arg Met Asp Ser Tyr
145 150 155 160

Ala His Met Asn Gly Trp Ser Asn Gly Ser Tyr Ser Met Met Gln Asp
165 170 175

Gln Leu Gly Tyr Pro Gln His Pro Gly Leu Asn Ala His Gly Ala Ala
180 185 190

Gln Met Gln Pro Met His Arg Tyr Asp Val Ser Ala Leu Gln Tyr Asn
195 200 205

Ser Met Thr Ser Ser Gln Thr Tyr Met Asn Gly Ser Pro Thr Tyr Ser
210 215 220

Met Ser Tyr Ser Gln Gln Gly Thr Pro Gly Met Ala Leu Gly Ser Met
225 230 235 240

Gly Ser Val Val Lys Ser Glu Ala Ser Ser Ser Pro Pro Val Val Thr
245 250 255

Ser Ser Ser His Ser Arg Ala Pro Cys Gln Ala Gly Asp Leu Arg Asp
260 265 270

Met Ile Ser Met Tyr Leu Pro Gly Ala Glu Val Pro Glu Pro Ala Ala
275 280 285

Pro Ser Arg Leu His Met Ser Gln His Tyr Gln Ser Gly Pro Val Pro
290 295 300

Gly Thr Ala Ile Asn Gly Thr Leu Pro Leu Ser His Met
305 310 315

<210> 51
<211> 1440
<212> DNA
<213> Homo sapiens

15477SG41_Sequence Listing

```

<400> 51
atgaggcagc cacctggcga gtctgacatg gctgtcagcg acgcgctgct cccatctttc 60
tccacgttcg cgtctggccc ggcggaagg gagaagacac tgcgtcaagc aggtgccccg 120
aataaccgct ggcgaggagga gctctccac atgaagcgac ttccccagc gcttcccggc 180
cgcccctatg acctggcggc ggcgaccgtg gccacagacc tggagagcgg cggagccggt 240
gcggcttgcg gcggtagcaa cctggcgccc ctacctcgga gagagaccga ggagttcaac 300
gatctcctgg acctggactt tattctctcc aattcgctga cccatcctcc ggagtcagtg 360
gccgccaccg tgcctcgtc agcgtcagcc tcctcttcgt cgtcgccgtc gagcagcggc 420
cctgccagcg cgccctccac ctgcagcttc acctatccga tccgggccgg gaacgaccgg 480
ggcgtggcgc cgggcggcac gggcgaggc ctctctatg gcagggagtc cgctccccct 540
ccgacggctc cttcaacct ggcgacatc aacgacgtga gcccctcggg cggcttcgtg 600
gccgagctcc tgcggccaga attggaccgg gtgtacattc cgccgcagca gccgcagccg 660
ccagggtggc ggctgatggg caagtctgtg ctgaaggcgt cgctgagcgc ccctggcagc 720
gagtacggca gcccgtcggg catcagcgtc agcaaaggca gccctgacgg cagccaccgg 780
gtggtggtgg cgccctacaa cggcgggccg ccgcgcacgt gcccgaagat caagcaggag 840
gcggtctctt cgtgcacca cttgggcgct ggacccccct tcagcaatgg ccaccggccg 900
gctgcacacg acttccccct ggggcggcag ctccccagca ggactacccc gaccctgggt 960
cttgaggaag tgctgagcag cagggactgt caccctgccc tgccgcttcc tcccgcttc 1020
catccccacc cggggcccaa ttaccatcc ttctgcccg atcagatgca gccgcaagtc 1080
ccgccgtcc attaccaaga gctcatgcca cccggttcct gcatgccaga ggagcccaag 1140
ccaaagaggg gaagacgatc gtggccccgg aaaaggaccg ccaccacac ttgtgattac 1200
gcgggctgcg gcaaaacct cacaagagt tccatctca aggcacacct gcgaaccac 1260
acaggtgaga aaccttacca ctgtgactgg gacggctgtg gatggaaatt cgcccgtca 1320
gatgaactga ccaggcacta ccgtaaacc acggggcacc gccggtcca gtgcaaaaaa 1380
tgcgaccgag cattttccag gtcggaccac ctcgccttac acatgaagag gcatttttaa 1440

```

```

<210> 52
<211> 479
<212> PRT
<213> Homo sapiens

```

<400> 52

```

Met Arg Gln Pro Pro Gly Glu Ser Asp Met Ala Val Ser Asp Ala Leu
1           5           10           15

```

Leu Pro Ser Phe Ser Thr Phe Ala Ser Gly Pro Ala Gly Arg Glu Lys

15477SG41_Sequence Listing

20

25

30

Thr Leu Arg Gln Ala Gly Ala Pro Asn Asn Arg Trp Arg Glu Glu Leu
 35 40 45

Ser His Met Lys Arg Leu Pro Pro Val Leu Pro Gly Arg Pro Tyr Asp
 50 55 60

Leu Ala Ala Ala Thr Val Ala Thr Asp Leu Glu Ser Gly Gly Ala Gly
 65 70 75 80

Ala Ala Cys Gly Gly Ser Asn Leu Ala Pro Leu Pro Arg Arg Glu Thr
 85 90 95

Glu Glu Phe Asn Asp Leu Leu Asp Leu Asp Phe Ile Leu Ser Asn Ser
 100 105 110

Leu Thr His Pro Pro Glu Ser Val Ala Ala Thr Val Ser Ser Ser Ala
 115 120 125

Ser Ala Ser Ser Ser Ser Ser Pro Ser Ser Ser Gly Pro Ala Ser Ala
 130 135 140

Pro Ser Thr Cys Ser Phe Thr Tyr Pro Ile Arg Ala Gly Asn Asp Pro
 145 150 155 160

Gly Val Ala Pro Gly Gly Thr Gly Gly Gly Leu Leu Tyr Gly Arg Glu
 165 170 175

Ser Ala Pro Pro Pro Thr Ala Pro Phe Asn Leu Ala Asp Ile Asn Asp
 180 185 190

Val Ser Pro Ser Gly Gly Phe Val Ala Glu Leu Leu Arg Pro Glu Leu
 195 200 205

Asp Pro Val Tyr Ile Pro Pro Gln Gln Pro Gln Pro Pro Gly Gly Gly
 210 215 220

Leu Met Gly Lys Phe Val Leu Lys Ala Ser Leu Ser Ala Pro Gly Ser
 225 230 235 240

Glu Tyr Gly Ser Pro Ser Val Ile Ser Val Ser Lys Gly Ser Pro Asp
 245 250 255

Gly Ser His Pro Val Val Val Ala Pro Tyr Asn Gly Gly Pro Pro Arg
 260 265 270

15477SG41_Sequence Listing

Thr Cys Pro Lys Ile Lys Gln Glu Ala Val Ser Ser Cys Thr His Leu
275 280 285

Gly Ala Gly Pro Pro Leu Ser Asn Gly His Arg Pro Ala Ala His Asp
290 295 300

Phe Pro Leu Gly Arg Gln Leu Pro Ser Arg Thr Thr Pro Thr Leu Gly
305 310 315 320

Leu Glu Glu Val Leu Ser Ser Arg Asp Cys His Pro Ala Leu Pro Leu
325 330 335

Pro Pro Gly Phe His Pro His Pro Gly Pro Asn Tyr Pro Ser Phe Leu
340 345 350

Pro Asp Gln Met Gln Pro Gln Val Pro Pro Leu His Tyr Gln Glu Leu
355 360 365

Met Pro Pro Gly Ser Cys Met Pro Glu Glu Pro Lys Pro Lys Arg Gly
370 375 380

Arg Arg Ser Trp Pro Arg Lys Arg Thr Ala Thr His Thr Cys Asp Tyr
385 390 395 400

Ala Gly Cys Gly Lys Thr Tyr Thr Lys Ser Ser His Leu Lys Ala His
405 410 415

Leu Arg Thr His Thr Gly Glu Lys Pro Tyr His Cys Asp Trp Asp Gly
420 425 430

Cys Gly Trp Lys Phe Ala Arg Ser Asp Glu Leu Thr Arg His Tyr Arg
435 440 445

Lys His Thr Gly His Arg Pro Phe Gln Cys Gln Lys Cys Asp Arg Ala
450 455 460

Phe Ser Arg Ser Asp His Leu Ala Leu His Met Lys Arg His Phe
465 470 475

<210> 53
<211> 1095
<212> DNA
<213> Homo sapiens

<400> 53
atggactacg actcgtacca gcactatttc tacgactatg actgcgggga ggatttctac 60
cgctccacgg cgcccagcga ggacatctgg aagaaattcg agctggtgcc atcgcccccc 120
acgtcgccgc cctggggcctt ggggtcccggc gcagggggacc cggcccccg gattggtccc 180

15477SG41_Sequence Listing

```

ccggagccgt ggcccggagg gtgcaccgga gacgaagcgg aatcccgggg ccactcgaaa    240
ggctgggggca ggaactacgc ctccatcata cgccgtgact gcatgtggag cggcttctcg    300
gcccgggaac ggctggagag agctgtgagc gaccggctcg ctctggcgc gcccggggg    360
aaccgcca aggcgtccgc cgcccggac tgcactcca gcctcgaagc cggcaaccg    420
gcgcccgcg cccctgtcc gctgggcgaa cccaagaccc aggctgctc cgggtccgag    480
agcccaagcg actcggagaa tgaagaaatt gatgttgta cagtagagaa gaggcagtct    540
ctgggtattc ggaagccgt caccatcacg gtgcgagcag accccctgga tccctgcatg    600
aagcatttcc acatctccat ccatacagcaa cagcacaact atgctgcccg ttttctcca    660
gaaagctgct cccaagaaga ggcttcagag aggggtcccc aagaagagg tctggagaga    720
gatgctgcag gggaaaagga agatgaggag gatgaagaga ttgtgagtcc cccacctgta    780
gaaagtgagg ctgcccagtc ctgccacccc aaacctgtca gttctgatac tgaggatgtg    840
accaagagga agaatacaca cttcctggag cgcaagaggc ggaatgacct gcgttcgcga    900
ttcttggcgc tgagggacca ggtgcccacc ctggccagct gctccaaggc ccccaaagta    960
gtgatcctaa gcaaggcctt ggaatacttg caagccctgg tgggggctga gaagaggatg   1020
gctacagaga aaagacagct ccgatgccgg cagcagcagt tgcagaaaag aattgcatac   1080
ctcactggct actaa                                           1095

```

```

<210> 54
<211> 364
<212> PRT
<213> Homo sapiens

```

```

<400> 54

```

```

Met Asp Tyr Asp Ser Tyr Gln His Tyr Phe Tyr Asp Tyr Asp Cys Gly
1          5          10          15

```

```

Glu Asp Phe Tyr Arg Ser Thr Ala Pro Ser Glu Asp Ile Trp Lys Lys
20          25          30

```

```

Phe Glu Leu Val Pro Ser Pro Pro Thr Ser Pro Pro Trp Gly Leu Gly
35          40          45

```

```

Pro Gly Ala Gly Asp Pro Ala Pro Gly Ile Gly Pro Pro Glu Pro Trp
50          55          60

```

```

Pro Gly Gly Cys Thr Gly Asp Glu Ala Glu Ser Arg Gly His Ser Lys
65          70          75          80

```

```

Gly Trp Gly Arg Asn Tyr Ala Ser Ile Ile Arg Arg Asp Cys Met Trp
85          90          95

```

15477SG41_Sequence Listing

Ser Gly Phe Ser Ala Arg Glu Arg Leu Glu Arg Ala Val Ser Asp Arg
 100 105 110
 Leu Ala Pro Gly Ala Pro Arg Gly Asn Pro Pro Lys Ala Ser Ala Ala
 115 120 125
 Pro Asp Cys Thr Pro Ser Leu Glu Ala Gly Asn Pro Ala Pro Ala Ala
 130 135 140
 Pro Cys Pro Leu Gly Glu Pro Lys Thr Gln Ala Cys Ser Gly Ser Glu
 145 150 155 160
 Ser Pro Ser Asp Ser Glu Asn Glu Glu Ile Asp Val Val Thr Val Glu
 165 170 175
 Lys Arg Gln Ser Leu Gly Ile Arg Lys Pro Val Thr Ile Thr Val Arg
 180 185 190
 Ala Asp Pro Leu Asp Pro Cys Met Lys His Phe His Ile Ser Ile His
 195 200 205
 Gln Gln Gln His Asn Tyr Ala Ala Arg Phe Pro Pro Glu Ser Cys Ser
 210 215 220
 Gln Glu Glu Ala Ser Glu Arg Gly Pro Gln Glu Glu Val Leu Glu Arg
 225 230 235 240
 Asp Ala Ala Gly Glu Lys Glu Asp Glu Glu Asp Glu Glu Ile Val Ser
 245 250 255
 Pro Pro Pro Val Glu Ser Glu Ala Ala Gln Ser Cys His Pro Lys Pro
 260 265 270
 Val Ser Ser Asp Thr Glu Asp Val Thr Lys Arg Lys Asn His Asn Phe
 275 280 285
 Leu Glu Arg Lys Arg Arg Asn Asp Leu Arg Ser Arg Phe Leu Ala Leu
 290 295 300
 Arg Asp Gln Val Pro Thr Leu Ala Ser Cys Ser Lys Ala Pro Lys Val
 305 310 315 320
 Val Ile Leu Ser Lys Ala Leu Glu Tyr Leu Gln Ala Leu Val Gly Ala
 325 330 335
 Glu Lys Arg Met Ala Thr Glu Lys Arg Gln Leu Arg Cys Arg Gln Gln

Gln Leu Gln Lys Arg Ile Ala Tyr Leu Thr Gly Tyr
355 360

<210> 55
<211> 20
<212> DNA
<213> Artificial

<220>
<223> SRF-F

<400> 55
accataagc cccagctatc 20

<210> 56
<211> 20
<212> DNA
<213> Artificial

<220>
<223> SRF-R

<400> 56
ggtgccaaga tggaagtcac 20

<210> 57
<211> 20
<212> DNA
<213> Artificial

<220>
<223> ACTG2-F

<400> 57
cggtggtctc ctcttcacac 20

<210> 58
<211> 22
<212> DNA
<213> Artificial

<220>
<223> ACTG2-R

<400> 58
cactgggaga agaacctctc at 22

<210> 59
<211> 1041
<212> DNA
<213> Homo sapiens

<400> 59
atggctcctg ggagcgtcac cagcgacatc tcacctcct cgacttcac agcaggatca 60

15477SG41_Sequence Listing

tccaggtctc ctgaatctga aaagccaggc ccgagccacg gcggtgtccc accaggaggc	120
ccgagccaca gcagcctccc ggtgggacgc cgccaccccc cggtgctacg catggtgctg	180
gaggcgctgc aggctgggga gcagcgccgg ggcacgtcgg tggcagctat caagctctac	240
atcctgcaca agtacccaac agtggacgtc ctccgcttca agtacctgct gaagcaggcg	300
ctggccactg gcatgcgccg tggcctcctc gccaggcccc tcaactccaa agccaggggg	360
gccactggca gcttcaaatt agttcccaag cacaagaaga aaatccagcc caggaagatg	420
gccccgcga cggtccccag gagagcgggt gaggccaagg ggaagggccc caagaaacca	480
agtgaggcca aggaggaccc tcccaacgtg ggcaagggtga aaaaggcagc caagaggcca	540
gcaaagggtc agaagcctcc tcccaagcca ggcgcagcca cagagaaggc tcgcaagcaa	600
ggcggcgcg gccaaggacac cagggcacag tcgggagagg ctaggaagggt gccccccaag	660
ccagacaagg ccatgcgggc accttccagt gctggtgggc tcagcaggaa ggcaaaggcc	720
aaaggcagca ggagcagcca aggagatgct gaggctaca ggaaaaccaa agctgagagt	780
aagagttcaa aaccacggc cagcaagggtc aagaatggtg ctgcttcccc gacaaaaaag	840
aagggtggtg ccaaggccaa ggcccctaaa gctgggcagg ggccaaacac caaggctgct	900
gctctgcta agggcagtgg gtccaagggtg gtacctgcac atttgtccag gaagacagag	960
gcccccaagg gccctagaaa ggctgggctg cccatcaagg cctcatcatc caaagtgtcc	1020
agccagaggg ctgaagctta g	1041

<210> 60
 <211> 346
 <212> PRT
 <213> Homo sapiens
 <400> 60

Met Ala Pro Gly Ser Val Thr Ser Asp Ile Ser Pro Ser Ser Thr Ser
 1 5 10 15

Thr Ala Gly Ser Ser Arg Ser Pro Glu Ser Glu Lys Pro Gly Pro Ser
 20 25 30

His Gly Gly Val Pro Pro Gly Gly Pro Ser His Ser Ser Leu Pro Val
 35 40 45

Gly Arg Arg His Pro Pro Val Leu Arg Met Val Leu Glu Ala Leu Gln
 50 55 60

Ala Gly Glu Gln Arg Arg Gly Thr Ser Val Ala Ala Ile Lys Leu Tyr
 65 70 75 80

Ile Leu His Lys Tyr Pro Thr Val Asp Val Leu Arg Phe Lys Tyr Leu
 Page 23

15477SG41_Sequence Listing

85

90

95

Leu Lys Gln Ala Leu Ala Thr Gly Met Arg Arg Gly Leu Leu Ala Arg
 100 105 110
 Pro Leu Asn Ser Lys Ala Arg Gly Ala Thr Gly Ser Phe Lys Leu Val
 115 120 125
 Pro Lys His Lys Lys Lys Ile Gln Pro Arg Lys Met Ala Pro Ala Thr
 130 135 140
 Ala Pro Arg Arg Ala Gly Glu Ala Lys Gly Lys Gly Pro Lys Lys Pro
 145 150 155 160
 Ser Glu Ala Lys Glu Asp Pro Pro Asn Val Gly Lys Val Lys Lys Ala
 165 170 175
 Ala Lys Arg Pro Ala Lys Val Gln Lys Pro Pro Pro Lys Pro Gly Ala
 180 185 190
 Ala Thr Glu Lys Ala Arg Lys Gln Gly Gly Ala Ala Lys Asp Thr Arg
 195 200 205
 Ala Gln Ser Gly Glu Ala Arg Lys Val Pro Pro Lys Pro Asp Lys Ala
 210 215 220
 Met Arg Ala Pro Ser Ser Ala Gly Gly Leu Ser Arg Lys Ala Lys Ala
 225 230 235 240
 Lys Gly Ser Arg Ser Ser Gln Gly Asp Ala Glu Ala Tyr Arg Lys Thr
 245 250 255
 Lys Ala Glu Ser Lys Ser Ser Lys Pro Thr Ala Ser Lys Val Lys Asn
 260 265 270
 Gly Ala Ala Ser Pro Thr Lys Lys Lys Val Val Ala Lys Ala Lys Ala
 275 280 285
 Pro Lys Ala Gly Gln Gly Pro Asn Thr Lys Ala Ala Ala Pro Ala Lys
 290 295 300
 Gly Ser Gly Ser Lys Val Val Pro Ala His Leu Ser Arg Lys Thr Glu
 305 310 315 320
 Ala Pro Lys Gly Pro Arg Lys Ala Gly Leu Pro Ile Lys Ala Ser Ser
 325 330 335

15477SG41 Sequence Listing
 Ser Lys Val Ser Ser Gln Arg Ala Glu Ala
 340 345