

<110> CJ CheilJedang Corporation
 <120> Superoxide dismutase 1 variant and method for producing glutathione or derivative thereof, using same
 <130> OPA22037
 <150> KR 10-2021-0075689
 <151> 2021-06-10
 <160> 30
 <170> KoPatentIn 3.0
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 <213> Saccharomyces cerevisiae
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 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Gly Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

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 <212> DNA
 <213> *Saccharomyces cerevisiae*

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 aacgcagaac gtgggttcca cattcatgag tttggagatg ccaccaatgg ttgtgtctct 180
 gctggtcctc acttcaatcc tttcaagaag acacatggtg ctccaactga cgaagtcaga 240
 catgtcgggtg acatgggtaa cgtaaagacg gacgaaaatg gtgtggccaa gggctccttc 300
 aaggactctt tgatcaagct tatcggtcct acctccgttg taggcagaag cgtcgttatc 360
 cacgccggcc aagatgactt aggtaagggt gacactgaag aatctttgaa gactggtaat 420
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<210> 3
 <211> 465
 <212> DNA
 <213> Unknown

<220>
 <223> *Saccharomyces cerevisiae*_CC02-2816_sod1

<400> 3
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 aacgcagaac gtgggttcca tattcatgag tttggagatg ccaccaatgg ttgtgtctct 180
 gctggtcctc acttcaatcc tttcaagaag acacacggtg ctccaactga cgaagtcaga 240
 catgtcgggtg acatgggtaa cgtaaagacg gacgaaaatg gtgtggccaa gggctccttc 300
 aaggactctt tgatcaagct tatcggtcct acctccgttg taggcagaag cgtcgttatc 360
 cacgccggcc aagatgactt aggtaagggt gacactgaag aatctttgaa gactggtaat 420
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<210> 4
<211> 35
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<213> Artificial Sequence

<220>
<223> F_BamHI_SOD1

<400> 4
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<210> 5
<211> 25
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<220>
<223> F_SOD1_G37R

<400> 5
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<210> 6
<211> 25
<212> DNA
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<220>
<223> R_SOD1_G37R

<400> 6
aggactgttg cgagcgatct cgtaa 25

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<220>
<223> R_XhoI_SOD1

<400> 7

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<210> 8
<211> 34
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<220>
<223> F_SpeI_SOD1_DW

<400> 8
tagaactagt tgtaatgat aatatacttg aata 34

<210> 9
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<220>
<223> R_NcoI_SOD1_DW

<400> 9
gctgccatgg acactactag ctcctgaaga ccaag 35

<210> 10
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<223> R_AL killer

<400> 10
gagcaatgaa cccaataacg aaatctt 27

<210> 11
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<220>
<223> F_BR killer

<400> 11
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24

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 <212> PRT
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<400> 12
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 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Ala Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

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<220>

<223> SOD1 G37C

<400> 13

Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
20 25 30

Tyr Glu Ile Ala Cys Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
35 40 45

His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
65 70 75 80

His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
85 90 95

Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 14

<211> 154

<212> PRT

<213> Artificial Sequence

<220>

<223> SOD1 G37D

<400> 14

Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Asp Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

<210> 15
 <211> 154
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37E

<400> 15
 Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
 1 5 10 15
 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Glu Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

<210> 16
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37F

<400> 16
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 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Phe Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 17
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<212> PRT
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<220>
<223> SOD1 G37H

<400> 17
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1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
20 25 30

Tyr Glu Ile Ala His Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
35 40 45

His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
65 70 75 80

His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
85 90 95

Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 18
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37I

<400> 18
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 1 5 10 15
 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Ile Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

<210> 19
 <211> 154
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37K

<400> 19
 Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
 1 5 10 15

 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30

 Tyr Glu Ile Ala Lys Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45

 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60

 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80

 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95

 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110

 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125

 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140

 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

<210> 20
 <211> 154
 <212> PRT
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<220>
 <223> SOD1 G37L

<400> 20
 Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
 1 5 10 15

 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30

 Tyr Glu Ile Ala Leu Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile

	35		40		45	
His	Glu	Phe	Gly	Asp	Ala	Thr
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Asn	Gly	Cys	Val	Ser	Ala	Gly
60						
Phe	Asn	Pro	Phe	Lys	Lys	Thr
65					70	
His	Gly	Ala	Pro	Thr	Asp	Glu
75						
Val	Arg					
80						
His	Val	Gly	Asp	Met	Gly	Asn
85						90
Val	Lys	Thr	Asp	Glu	Asn	Gly
95						
Val	Ala					
Lys	Gly	Ser	Phe	Lys	Asp	Ser
100						
Leu	Ile	Lys	Leu	Ile	Gly	Pro
105						110
Thr	Ser					
Val	Val	Gly	Arg	Ser	Val	Val
115						120
Ile	His	Ala	Gly	Gln	Asp	Asp
125						
Leu	Gly					
Lys	Gly	Asp	Thr	Glu	Glu	Ser
130						135
Leu	Lys	Thr	Gly	Asn	Ala	Gly
140						
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145						150
Leu	Thr	Asn				

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 <212> PRT
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<220>
 <223> SOD1 G37M

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Val	Val	Lys	Phe	Glu	Gln	Ala	Ser	Glu	Ser	Glu	Pro	Thr	Thr	Val	Ser
			20					25					30		
Tyr	Glu	Ile	Ala	Met	Asn	Ser	Pro	Asn	Ala	Glu	Arg	Gly	Phe	His	Ile
	35						40					45			
His	Glu	Phe	Gly	Asp	Ala	Thr	Asn	Gly	Cys	Val	Ser	Ala	Gly	Pro	His
50						55					60				
Phe	Asn	Pro	Phe	Lys	Lys	Thr	His	Gly	Ala	Pro	Thr	Asp	Glu	Val	Arg
65					70					75					80
His	Val	Gly	Asp	Met	Gly	Asn	Val	Lys	Thr	Asp	Glu	Asn	Gly	Val	Ala

130	135	140
Pro Ala Cys Gly Val Ile Gly Leu Thr Asn		
145	150	
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<211>	154	
<212>	PRT	
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<223>	SOD1 G37P	
<400>	23	
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1	5	10 15
Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser		
	20	25 30
Tyr Glu Ile Ala Pro Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile		
	35	40 45
His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His		
	50	55 60
Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg		
	65	70 75 80
His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala		
	85	90 95
Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser		
	100	105 110
Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly		
	115	120 125
Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg		
	130	135 140
Pro Ala Cys Gly Val Ile Gly Leu Thr Asn		
145	150	

<210> 24
 <211> 154
 <212> PRT

<213> Artificial Sequence

<220>

<223> SOD1 G37Q

<400> 24

Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
20 25 30

Tyr Glu Ile Ala Gln Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
35 40 45

His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
65 70 75 80

His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
85 90 95

Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 25

<211> 154

<212> PRT

<213> Artificial Sequence

<220>

<223> SOD1 G37R

<400> 25

Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Arg Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

<210> 26
 <211> 154
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37S

<400> 26
 Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
 1 5 10 15
 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Ser Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
65 70 75 80

His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
85 90 95

Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 27
<211> 154
<212> PRT
<213> Artificial Sequence

<220>
<223> SOD1 G37T

<400> 27
Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
20 25 30

Tyr Glu Ile Ala Thr Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
35 40 45

His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
65 70 75 80

His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
85 90 95

Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 28
<211> 154
<212> PRT
<213> Artificial Sequence

<220>
<223> SOD1 G37V

<400> 28
Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
1 5 10 15

Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
20 25 30

Tyr Glu Ile Ala Val Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
35 40 45

His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
50 55 60

Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
65 70 75 80

His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
85 90 95

Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
100 105 110

Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
115 120 125

Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
130 135 140

Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
145 150

<210> 29
 <211> 154
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37W

<400> 29
 Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
 1 5 10 15
 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Trp Asn Ser Pro Asn Ala Glu Arg Gly Phe His Ile
 35 40 45
 His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro His
 50 55 60
 Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val Arg
 65 70 75 80
 His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val Ala
 85 90 95
 Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr Ser
 100 105 110
 Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu Gly
 115 120 125
 Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro Arg
 130 135 140
 Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150

<210> 30
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SOD1 G37Y

<400> 30
 Met Val Gln Ala Val Ala Val Leu Lys Gly Asp Ala Gly Val Ser Gly
 1 5 10 15
 Val Val Lys Phe Glu Gln Ala Ser Glu Ser Glu Pro Thr Thr Val Ser
 20 25 30
 Tyr Glu Ile Ala Ala Tyr Asn Ser Pro Asn Ala Glu Arg Gly Phe His
 35 40 45
 Ile His Glu Phe Gly Asp Ala Thr Asn Gly Cys Val Ser Ala Gly Pro
 50 55 60
 His Phe Asn Pro Phe Lys Lys Thr His Gly Ala Pro Thr Asp Glu Val
 65 70 75 80
 Arg His Val Gly Asp Met Gly Asn Val Lys Thr Asp Glu Asn Gly Val
 85 90 95
 Ala Lys Gly Ser Phe Lys Asp Ser Leu Ile Lys Leu Ile Gly Pro Thr
 100 105 110
 Ser Val Val Gly Arg Ser Val Val Ile His Ala Gly Gln Asp Asp Leu
 115 120 125
 Gly Lys Gly Asp Thr Glu Glu Ser Leu Lys Thr Gly Asn Ala Gly Pro
 130 135 140
 Arg Pro Ala Cys Gly Val Ile Gly Leu Thr Asn
 145 150 155