

LISTADO DE SECUENCIAS

<110> Fraaije MW, Wu J, Heuts DPHM, van Hellemond EW, Spelberg JHL, Janssen DB. Discovery of a thermostable Baeyer-Villiger
 5 monooxygenase by genome mining, Appl. Microbiol. Biotechnol. 2005. 66:393-400.

<120> Enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria de nombre científico *Thermofibida fusca*

10

<160> 27

<210> SEQ ID No.:1

<211> 542

15 <212> Proteína

<213> PAMO aislada de *Thermofibida fusca* YX

<400>

	MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY	60
20	PGARCDIESI EYCYSFSEEV LQEWNTWTERY ASQPEILRYI NFVADKFDLR SGITFHTT VT	120
	AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE	180
	PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK	240
	RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD	300
	ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVD TLS	360
25	APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY	420
	LGLSTAGFPN LFFIAGPGSP SALS NMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED	480
	EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKG YEGFV	540
	LT	

30 <110> Fraaije MW, Wu J, Heuts DPHM, van Hellemond EW, Spelberg JHL, Janssen DB. Discovery of a thermostable Baeyer-Villiger

monooxygenase by genome mining, Appl. Microbiol. Biotechnol. 2005. 66:393-400.

<120> Enzima fenilacetona Monooxigenasa (PAMO) aislada a partir
5 de *Thermofibida fusca*

<160> 27

<210> SEQ ID No.:2

10 <211> 1623

<212> ácido nucleico

<213> ácido nucleico que codifica enzima PAMO aislada de
Thermofibida fusca YX

15 <400>

CTAGGTGAGG ACGAAACCTT CGTAGCCCTT GGCAGCCACC TCGTCGCAGA TCTGCCGGTA
60

GCGGTGGAAG CCGCCGACGT AGAGCATGAA CACCCGGGGT TTACCGGGGA CGTTGGCGCC
120

20 CGTGTACCAC GAGGCGGTCA TGGGGTAGAG GGTTTCGTCG GCGATCTCGT TGACGTGCTC
180

CACCCACTCG TCTTCTTTCT CCAGGACTGC CTCGGATCGG GTGAGGCCGT TCTTGAACAT
240

GTAGGCGATG TGGTCGGTCA CCCATTCCAC GTGCTGTTTCG ATAGAGACCA GCATGTTGCT

25 300

GAGCGCAGAC GGGCTGCCCCG GGCCTGCGAT GAAGAACAGG TTGGGGAACC CGGCGGTGGA
360

CAGTCCCAGG TAGGTGCGTG GCCCTGCGGC CCACTTCTCC TTCAAAGCGA CGTTGCCAC
420

30 ACCGCGGATG TCGATCTTGA ACAGCGCCCC GGTCAGCGCG TCGAACCCGG TCGCCAGCAC
480

	CAGGGAGTCG	AGTTCGTACT	CCCGTTCCGA	GGTGCGCACC	CCGCGCGGCG	TGATCGTCTC
	540					
	GATCGGCGCA	GACAACGTGT	CGACCAGGTG	CACGTTGTCC	CGGTTGAACA	TTTCGTAGTA
	600					
5	GTCGATTTCC	AGGATGAGGC	GCTTGGTGCC	GAACGGGTAG	CCCTTGGGGA	CCAGGCGTTC
	660					
	CGCCACCTCCG	GGTCGCGCAC	GGTGTGCGG	ATCTTGTTGC	GGATGAATTC	AGCGACCCGT
	720					
	TCGTTGGCGT	CCCGGTCGCG	CAGGATGTCG	CGGTAGGCGG	CCAGAATGTC	GGGGCCGCCC
10	780					
	TCCTGCCAGT	AGCGTTCCAG	GGTTTCCACC	AGCTCTTCGT	CGCTGACTTC	CAGCGCGGAC
	840					
	TTCGGCCCCCT	GGTAGCGGTG	GGTTCCTCCG	GGAGTGTTGC	GGGACTCTTC	CCGGAATTCG
	900					
15	GCGTAGCGCT	TCTTCAGGTC	GGCGAGGAAC	TCCGGGTCGA	GCGGCGCGTT	GCGGGCGGGG
	960					
	ACGGCAAAGT	GGGGGGTGCG	CTGGAACACGA	ACAGTTCCGC	AGCCTGTTTC	GCGATCTGTG
	1020					
	GGCTCACCTG	GATTCCGGAC	GACCCGGTGC	CGATCACGCCC	ACCCGCTGCC	CGGAGAAGTC
20	1080					
	CACGGGCTCG	TGCGGCCAGT	TCCCGGTGTG	GTAGAGGTTG	CCGGCGAAGT	CTTTGAGCCC
	1140					
	TGGGAAGTTG	GGGAGCTGCG	GGACGGAGAG	CTGGCCGCTG	GCCATGATGA	GGTAGCGGGC
	1200					
25	GCGGATCCGG	TCGCCGTGGT	TGGTGTGCAC	CGTCCACGTG	TTGGTGGCCT	CGTCGAAGGC
	1260					
	TGCCGGGTCA	CCGTGGTGTG	GAAGGTGATT	CCGCTCCGCA	GGTCGAATTT	GTCGGCGACG
	1320					
	AAGTTGATGT	AGCGCAGGAT	CTCGGGCTGG	GAAGCGTACC	GCTCAGTCCA	GTTCCACTCTT
30	1380					
	GGAGGACCTC	CTCGGAGAAC	GAGTAGCAGT	ACTCGATGCT	CTCGATGTCTG	CACCGCGCCC
	1440					
	CCGGGTAGCG	GTTCCAGTAC	CACACACCGC	CCACGTCGCCA	GCGGTTTTCGA	TGACGTGCAC
	1500					

GCTACGCCCCG AGTTCCTCGCA GACGGTAGAG GCGGTACAGG CCGGAGAAGC CGGCTCCCAC
1560

GACCAGGACG TCCACTTCCTC TGGTGGTTGT CGGCGAGAG TCGACAGTCG TCTG**CCCCGGC**
1620

5 CAT

<110> Reetz MT, Wu S. Laboratory Evolution of Robust and Enantioselective Baeyer-Villiger Monooxygenases for Asymmetric Catalysis. J. Am. Chem. Soc. 2009. 131:15424-32.

10

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en la posición 440 (P440F)

15 <160> 27

<210> SEQ ID No.:3

<211> 542

<212> Proteína

20 <213> variante P440F

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60

PGARCDIESI EYCYSFSEEV LQEWNWTERY ASQPEILRYI NFVADKFDLR SGITFHTT VT 120

25 AA AFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180

PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELVFVQRTPH FAVPARNAPL DPEFLADLKK 240

RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300

ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVD TLS 360

APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420

30 LGLSTAGFPN LFFIAGPGSF SALS NMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480

EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKG YEGFV 540

LT

<110> Wu S, Acevedo JP, Reetz MT. Induced Allostery in the Directed Evolution of an Enantioselective Baeyer-Villiger Monooxygenase. Proc. Natl.

5

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93 y 94 (Q93N/P94D)

10 <160> 27

<210> SEQ ID No.:4

<211> 542

<212> Proteína

15 <213> variante Q93N/P94D

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTT VT 120
 20 AAADFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVD TLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 25 LGLSTAGFPN LFFIAGPGSP SALS NMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKG YEGFV 540
 LT

<110> Pontificia Universidad Católica de Chile

30

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93, 94 y 440 (Q93N/P94D/P440F)

5 <160> 27

<210> SEQ ID No.:5

<211> 542

<212> Proteína

10 <213> variante Q93N/P94D/P440F

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120
 15 AAADFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 20 LGLSTAGFPN LFFIAGPGSF SALSNNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYSRQICDE VAAKGYEGFV 540
 LT

<110> Pontificia Universidad Católica de Chile

25

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93, 94, 440 y 442 (P93N/P94D/P440F/A442P)

30

<160> 27

<210> SEQ ID No.:6

<211> 542

<212> Proteína

<213> variante PV (Q93N/P94D/P440F/A442P/L443V)

5 <400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120
 AAADFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 10 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 LGLSTAGFPN LFFIAGPGSF SPVSNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540

15 LT

<110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)

20 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 sustituciones en las posiciones 93, 94, 440, 441, 442, 443 y
 444.

<160> 27

25

<210> SEQ ID No.:7

<211> 542

<212> Proteína

<213> Variante GPTQ (Q93N/P94D/P440F/S441G/A442P/L443T/S444Q)

30 <400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120

AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 5 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPARTY 420
 LGLSTAGFPN LFFIAGPGSF GPTQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540
 LT

10 <110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)
 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 sustituciones en las posiciones 93, 94, 440, 442, 443 y 444

15

<160> 27

<210> SEQ ID No.:8

<211> 542

20 <212> Proteína

<213> variante PTQ (Q93N/P94D/P440F/A442P/L443T/S444Q)

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 25 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTWT 120
 AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 30 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPARTY 420
 LGLSTAGFPN LFFIAGPGSF SPTQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 500
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540

LT

<110> Pontificia Universidad Católica de Chile

- 5 <120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93, 94, 440, 441 y 442

<160> 27

10

<210> SEQ ID No.:9

<211> 542

<212> Proteína

<213> variante DE (Q93N/P94D/P440F/S441D/A442E)

15

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120
 AAADFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 20 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 LGLSTAGFPN LFFIAGPGSF DELSNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 500
 25 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYSRQICDE VAAKGYEGFV 540

LT

<110> Pontificia Universidad Católica de Chile

- 30 <120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93, 94, 440 y 442

<160> 27

<210> SEQ ID No.:10

5 <211> 542

<212> Proteína

<213> variante P (Q93N/P94D/P440F/A442P)

<400>

10 MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTT VT 120
 AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 15 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVD TLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 LGLSTAGFPN LFFIAGPGSF SPLSNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 500
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540
 LT

20

<110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)
 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 25 sustituciones en las posiciones 93, 94, 440, 443 y 444

<160> 27

<210> SEQ ID No.:11

30 <211> 542

<212> Proteína

<213> Variante VQ (Q93N/P94D/P440F/L443V/S444Q)

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120
 5 AAADFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 400
 10 LGLSTAGFPN LFFIAGPGSF SAVQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540
 LT

<110> Pontificia Universidad Católica de Chile

15

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)
 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 sustituciones en las posiciones 93, 94, 440, 442, 443 y 444

20 <160> 27

<210> SEQ ID No.:12

<211> 542

<212> Proteína

25 <213> Variante PWQ (Q93N/P94D/P440F/A442P/L443W/S444Q)

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120
 30 AAADFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300

ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 LGLSTAGFPN LFFIAGPGSF SPWQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540

5 LT

<110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)
 10 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 sustituciones en las posiciones 93, 94, 440, 442 y 444

<160> 27

15 <210> SEQ ID No.:13

<211> 542

<212> Proteína

<213> Variante PLQ (Q93N/P94D/P440F/A442P/S444Q)

20 <400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTVT 120
 AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 25 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 400
 LGLSTAGFPN LFFIAGPGSF SPLQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540

30 LT

<110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93, 94, 440, 442, 443 y 444

5

<160> 27

<210> SEQ ID No.:14

10 <211> 542

<212> Proteína

<213> Variante PIQ (Q93N/P94D/P440F/A442P/L443I/S444Q)

<400>

15 MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTT VT 120
 AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 20 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVD TLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPR TY 420
 LGLSTAGFPN LFFIAGPGSF SPIQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKG YEGFV 540
 LT

25

<110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO) aislada a partir de la bacteria *Thermofibida fusca* que tiene sustituciones en las posiciones 93, 94, 440, 442, 443 y 444

30

<160> 27

<210> SEQ ID No.:15

<211> 542

<212> Proteína

5 <213> Variante PVQ (Q93N/P94D/P440F/A442P/L443V/S444Q)

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTT VT 120
 10 AA AFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVD TLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPR TY 420
 15 LGLSTAGFPN LFFIAGPGSF SPVQNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKG YEGFV 540
 LT

<110> Pontificia Universidad Católica de Chile

20

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)
 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 sustituciones en las posiciones 93, 94, 440, 441, 443 y 444

25 <160> 27

<210> SEQ ID No.:16

<211> 542

<212> Proteína

30 <213> Variante GATQ (Q93N/P94D/P440F/S441G/L443T/S444Q)

<400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTWT 120
 AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 5 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360
 APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 LGLSTAGFPN LFFIAGPGSF GATQNMVLSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMVLYVG FHRYSQICDE VAAKGYEGFV 540
 10 LT

<110> Pontificia Universidad Católica de Chile

<120> Variante de la enzima fenilacetona Monooxigenasa (PAMO)
 15 aislada a partir de la bacteria *Thermofibida fusca* que tiene
 sustituciones en las posiciones 93, 94, 440, 442 y 443.

<160> 27

20 <210> SEQ ID No.:17

<211> 542

<212> Proteína

<213> Variante PW (Q93N/P94D/P440F/A442P/L443W)

25 <400>

MAGQTTVDSR RQPPEEVDVL VVGAGFSGLY ALYRLRELGR SVHVIETAGD VGGVWYWNRY 60
 PGARCDIESI EYCYSFSEEV LQEWNWTERY ASNDEILRYI NFVADKFDLR SGITFHTTWT 120
 AAAFDEATNT WTVDTNHGDR IRARYLIMAS GQLSVPQLPN FPGLKDFAGN LYHTGNWPHE 180
 PVDFSGQRVG VIGTGSSGIQ VSPQIAKQAA ELFVFQRTPH FAVPARNAPL DPEFLADLKK 240
 30 RYAEFREESR NTPGGTHRYQ GPKSALEVSD EELVETLERY WQEGGPDILA AYRDILRDRD 300
 ANERVAEFIR NKIRNTVRDP EVAERLVPKG YPFGTKRLIL EIDYYEMFNR DNVHLVDTLS 360

APIETITPRG VRTSEREYEL DSLVLATGFD ALTGALFKID IRGVGNVALK EKWAAGPRTY 420
 LGLSTAGFPN LFFIAGPGSF SPWSNMLVSI EQHVEWVTDH IAYMFKNGLT RSEAVLEKED 480
 EWVEHVNEIA DETLYPMTAS WYTGANVPGK PRVFMLYVGG FHRYRQICDE VAAKGYEGFV 540
 LT

5

<110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante PV
 (Q93N/P94D/p440F/A442P/L443V)

10

<160> 27

<210> SEQ ID No.:18

<211> 1629

15 <212> ácido nucleico

<213> mutante codificante para variante PV
 (Q93N/P94D/P440F/A442P/L443V)

<400>

20 ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCCTG 60
 GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
 CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 25 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
 TTCCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGTG GCCGCACGAG 540
 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 30 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCGCAA CGCGCCGCTC GACCCGAGT TCCTCGCCGA CCTGAAGAAG 720
 CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780

GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 GAGGTGGCGG AACGCCTGGT CCCCAAGGGC TACCCGTTCG GCACCAAGCG CCTCATCCTG 1020
 5 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCC GGGCAGCTTT 1320
 10 TCTGCGCTCA GCAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCGTAAA CCCCGGGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 15 CTCACCTAG

<110> Pontificia Universidad Católica de Chile

<110> Pontificia Universidad Católica de Chile

20

<120> Mutante codificante para variante GPTQ
 (Q93N/P94D/P440F/S441G/A442P/L443T/S444Q)

<160> 27

25

<210> SEQ ID No.:19

<211> 1629

<212> ácido nucleico

<213> Mutante para variante GPTQ

30 (Q93N/P94D/P440F/S441G/A442P/L443T/S444Q)

<400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCCTG 60
 GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
 CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
 5 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
 TTCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGT GCCGCACGAG 540
 10 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720
 CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
 GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 15 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTCG GCACCAAGCG CCTCATCTG 1020
 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAATC 1140
 20 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCCC GGGCAGCTTT 1320
 GGTCCGACGC AGAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 25 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCAGTAAA CCCCAGGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 CTCACCTAG

30 <110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante PTQ
 (Q93N/P94D/P440F/A442P/L443T/S444Q)

<160> 27

<210> SEQ ID No.:20

5 <211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante PTQ
(Q93N/P94D/P440F/A442P/L443T/S444Q)

10 <400>

```

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCTCTG 60
GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
15 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
TTCCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGTG GCCGCACGAG 540
20 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCCAGCG CACCCCCAC 660
TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720
CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCC T GGAACGCTAC 840
25 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAGATCC GCAACACCGT GCGCGACCCG 960
GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTCTG GCACCAAGCG CCTCATCTCTG 1020
GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
30 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCC GGGCAGCTTT 1320
TCTCCGACGC AGAACATGCT GGTCTCTATC GAACAGCACG TGAATGGGT GACCGACCAC 1380

```

ATCGCCTACA TGTTC AAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCGGTAAA CCCCGGGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620

5 CTCACCTAG

<110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante DE
 10 (Q93N/P94D/P440F/S441D/A442E)

<160> 27

<210> SEQ ID No.:21

15 <211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante DE
 (Q93N/P94D/P440F/S441D/A442E)

20 <400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCCTG 60
 GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
 CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
 25 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
 TTCCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGTG GCCGCACGAG 540
 30 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720

CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
 GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 5 GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTCG GCACCAAGCG CCTCATCCTG 1020
 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 10 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCC GGGCAGCTTT 1320
 GATGGGCTCA GCAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCAGTAAA CCCCAGGTGT TCATGCTCTA CGTCGGCGGC 1560
 15 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 CTCACCTAG

<110> Pontificia Universidad Católica de Chile

20 <120> Mutante codificante para variante P
 (Q93N/P94D/P440F/A442P)

<160> 27

25 <210> SEQ ID No.:22

<211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante P
 (Q93N/P94D/P440F/A442P)

30

<400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCCTG 60
 GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
 CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
 5 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
 TTCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGT GCCGCACGAG 540
 10 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720
 CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
 GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 15 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTCG GCACCAAGCG CCTCATCTG 1020
 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAATC 1140
 20 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCCC GGGCAGCTTT 1320
 TCTCCGCTCA GCAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 25 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCAGTAAA CCCCAGGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 CTCACCTAG

30 <110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante VQ
 (Q93N/P94D/P440F/L443V/S444Q)

<160> 27

<210> SEQ ID No.:23

5 <211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante VQ
(Q93N/P94D/P440F/L443V/S444Q)

10 <400>

```

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCTTG 60
GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
15 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
TTCCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGTG GCCGCACGAG 540
20 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCCAGCG CACCCCCAC 660
TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720
CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
25 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAGATCC GCAACACCGT GCGCGACCCG 960
GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTCG GCACCAAGCG CCTCATCTTG 1020
GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
30 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCCC GGGCAGCTTT 1320
TCTGCGGTTC AGAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380

```

ATCGCCTACA TGTTC AAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCC GTAAA CCCC GGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 5 CTCACCTAG

<110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante PWQ
 10 (Q93N/P94D/P440F/A442P/L443W/S444Q)

<160> 27

<210> SEQ ID No.:24

15 <211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante PWQ
 (Q93N/P94D/P440F/A442P/L443W/S444Q)

20 <400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCTTG 60
 GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGACAG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
 CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
 25 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
 TTCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGTG GCCGCACGAG 540
 30 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720

CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
 GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 5 GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTTCG GCACCAAGCG CCTCATCCTG 1020
 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 10 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCC GGGCAGCTTT 1320
 TCTCCGTGGC AGAACATGCT GGTCTCTATC GAACAGCACG TGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCAGTAAA CCCCAGGTGT TCATGCTCTA CGTCGGCGGC 1560
 15 TCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 CTCACCTAG

<110> Pontificia Universidad Católica de Chile

20 <120> Mutante codificante para variante PLQ
 (Q93N/P94D/P440F/A442P/S444Q)

<160> 27

25 <210> SEQ ID No.:25

<211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante PLQ
 (Q93N/P94D/P440F/A442P/S444Q)

30 <400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCTCTG 60
 GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180

CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
 CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 5 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCC GCA GCTCCCCAAC 480
 TTCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGT GCCGCACGAG 540
 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720
 10 CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
 GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 TGGCAGGAGG GCGGCCCCGA CATCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAGATCC GCAACACCGT GCGCGACCCG 960
 GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTTCG GCACCAAGCG CCTCATCTTG 1020
 15 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAATC 1140
 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCCC GGGCAGCTTT 1320
 20 TCTCCGCTCC AGAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCC GTAAA CCCC GGTTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 25 CTCACCTAG

<110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante PIQ
 30 (Q93N/P94D/P440F/A442P/L443I/S444Q)

<160> 27

<210> SEQ ID No.:26

<211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante PIQ

5 (Q93N/P94D/P440F/A442P/L443I/S444Q)

<400>

	ATGGCCGGGC	AGACGACTGT	CGACTCTCGC	CGACAACCAC	CAGAGGAAGT	GGACGTCCTG	60
	GTCTGTTGGAG	CCGGCTTCTC	CGGCCTGTAC	GCCCTCTACC	GTCTGCGGGA	ACTCGGGCGT	120
10	AGCGTGCACG	TCATCGAAAC	CGCTGGCGAC	GTGGGCGGTG	TGTGGTACTG	GAACCGCTAC	180
	CCGGGGGCGC	GGTGCGACAT	CGAGAGCATC	GAGTACTGCT	ACTCGTTCTC	CGAGGAGGTC	240
	CTCCAAGAGT	GGAAC TGGAC	TGAGCGGTAC	GCTTCCAATG	ATGAGATCCT	GCGCTACATC	300
	AACTTCGTCG	CCGACAAATT	CGACCTGCGG	AGCGGAATCA	CCTTCCACAC	CACGGTGACC	360
	GCGGCAGCCT	TCGACGAGGC	CACCAACACG	TGGACGGTCG	ACACCAACCA	CGGCGACCGG	420
15	ATCCGCGCCC	GCTACCTCAT	CATGGCCAGC	GGCCAGCTCT	CCGTCCCGCA	GCTCCCCAAC	480
	TTCCAGGGC	TCAAAGACTT	CGCCGGCAAC	CTCTACCACA	CCGGGAAGTG	GCCGCACGAG	540
	CCCGTGGACT	TCTCCGGGCA	GCGGGTGGGC	GTGATCGGCA	CCGGGTCGTC	CGGAATCCAG	600
	GTGAGCCCAC	AGATCGCGAA	ACAGGCTGCG	GAACTGTTTCG	TGTTCCAGCG	CACCCCCCAC	660
	TTTGCCGTCC	CCGCCCGCAA	CGCGCCGCTC	GACCCGGAGT	TCCTCGCCGA	CCTGAAGAAG	720
20	CGCTACGCCG	AATTCCGGGA	AGAGTCCCGC	AACACTCCCG	GAGGAACCCA	CCGCTACCAG	780
	GGGCCGAAGT	CCGCGCTGGA	AGTCAGCGAC	GAAGAGCTGG	TGGAAACCCT	GGAACGCTAC	840
	TGGCAGGAGG	GCGGCCCCGA	CATTCTGGCC	GCCTACCGCG	ACATCCTGCG	CGACCGGGAC	900
	GCCAACGAAC	GGGTCGCTGA	ATTCATCCGC	AACAAGATCC	GCAACACCGT	GCGCGACCCG	960
	GAGGTGGCGG	AACGCCTGGT	CCCCAAGGGC	TACCCGTTCG	GCACCAAGCG	CCTCATCCTG	1020
25	GAAATCGACT	ACTACGAAAT	GTTCAACCGG	GACAACGTGC	ACCTGGTCGA	CACGTTGTCT	1080
	GCGCCGATCG	AGACGATCAC	GCCGCGCGGG	GTGCGCACCT	CGGAACGGGA	GTACGAACTC	1140
	GACTCCCTGG	TGCTGGCGAC	CGGGTTCGAC	GCGCTGACCG	GGGCGCTGTT	CAAGATCGAC	1200
	ATCCGCGGTG	TGGGCAACGT	CGCTTTGAAG	GAGAAGTGGG	CCGCAGGGCC	ACGCACCTAC	1260
	CTGGGACTGT	CCACCGCCGG	GTTCCCCAAC	CTGTTCTTCA	TCGCAGGGCC	GGGCAGCTTT	1320
30	TCTCCGATTC	AGAACATGCT	GGTCTCTATC	GAACAGCACG	TGGAATGGGT	GACCGACCAC	1380
	ATCGCCTACA	TGTTCAAGAA	CGGCCTCACC	CGATCCGAGG	CAGTCCTGGA	GAAAGAAGAC	1440
	GAGTGGGTGG	AGCACGTCAA	CGAGATCGCC	GACGAAACCC	TCTACCCCAT	GACCGCCTCG	1500
	TGGTACACGG	GCGCCAACGT	CCCCGGTAAA	CCCCGGGTGT	TCATGCTCTA	CGTCGGCGGC	1560

TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
CTCACCTAG

<110> Pontificia Universidad Católica de Chile

5

<120> Mutante codificante para variante PVQ
(Q93N/P94D/P440F/A442P/L443V/S444Q)

<160> 27

10

<210> SEQ ID No.:27

<211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante PVQ
(Q93N/P94D/P440F/A442P/L443V/S444Q)

15

<400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCCTG 60
GTCTGCGGGA ACTCGGGCGT 120
20 AGCGTGCACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240
CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
25 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
TTCCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGT GCCGCACGAG 540
CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCCAGCG CACCCCCAC 660
TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGGAGT TCCTCGCCGA CCTGAAGAAG 720
30 CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAACCCCT GGAACGCTAC 840
TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900

GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 GAGGTGGCGG AACGCCTGGT CCCCAGGGG TACCCGTTTCG GCACCAAGCG CCTCATCCTG 1020
 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
 5 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCC GGGCAGCTTT 1320
 TCTCCGGTTC AGAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 ATCGCCTACA TGTTCAAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 10 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCAGTAAA CCCCAGGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 CTCACCTAG

15 <110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante GATQ
 (Q93N/P94D/P440F/S441G/L443T/S444Q)

20 <160> 27

<210> SEQ ID No.:28

<211> 1629

<212> ácido nucleico

25 <213> Mutante codificante para variante GATQ
 (Q93N/P94D/P440F/S441G/L443T/S444Q)

<400>

ATGGCCGGGC AGACGACTGT CGACTCTCGC CGACAACCAC CAGAGGAAGT GGACGTCCTG 60
 30 GTCGTGGGAG CCGGCTTCTC CGGCCTGTAC GCCCTCTACC GTCTGCGGGA ACTCGGGCGT 120
 AGCGTGACG TCATCGAAAC CGCTGGCGAC GTGGGCGGTG TGTGGTACTG GAACCGCTAC 180
 CCGGGGGCGC GGTGCGACAT CGAGAGCATC GAGTACTGCT ACTCGTTCTC CGAGGAGGTC 240

CTCCAAGAGT GGAAGTGGAC TGAGCGGTAC GCTTCCAATG ATGAGATCCT GCGCTACATC 300
 AACTTCGTCG CCGACAAATT CGACCTGCGG AGCGGAATCA CCTTCCACAC CACGGTGACC 360
 GCGGCAGCCT TCGACGAGGC CACCAACACG TGGACGGTCG ACACCAACCA CGGCGACCGG 420
 ATCCGCGCCC GCTACCTCAT CATGGCCAGC GGCCAGCTCT CCGTCCCGCA GCTCCCCAAC 480
 5 TTCCCAGGGC TCAAAGACTT CGCCGGCAAC CTCTACCACA CCGGGAAGT GCCGCACGAG 540
 CCCGTGGACT TCTCCGGGCA GCGGGTGGGC GTGATCGGCA CCGGGTCGTC CGGAATCCAG 600
 GTGAGCCCAC AGATCGCGAA ACAGGCTGCG GAACTGTTCG TGTTCAGCG CACCCCCAC 660
 TTTGCCGTCC CCGCCCGCAA CGCGCCGCTC GACCCGAGT TCCTCGCCGA CCTGAAGAAG 720
 CGCTACGCCG AATTCCGGGA AGAGTCCCGC AACACTCCCG GAGGAACCCA CCGCTACCAG 780
 10 GGGCCGAAGT CCGCGCTGGA AGTCAGCGAC GAAGAGCTGG TGGAAACCCT GGAACGCTAC 840
 TGGCAGGAGG GCGGCCCCGA CATTCTGGCC GCCTACCGCG ACATCCTGCG CGACCGGGAC 900
 GCCAACGAAC GGGTCGCTGA ATTCATCCGC AACAAAGATCC GCAACACCGT GCGCGACCCG 960
 GAGGTGGCGG AACGCCTGGT CCCCAGGGC TACCCGTTCG GCACCAAGCG CCTCATCTTG 1020
 GAAATCGACT ACTACGAAAT GTTCAACCGG GACAACGTGC ACCTGGTCGA CACGTTGTCT 1080
 15 GCGCCGATCG AGACGATCAC GCCGCGCGGG GTGCGCACCT CGGAACGGGA GTACGAACTC 1140
 GACTCCCTGG TGCTGGCGAC CGGGTTCGAC GCGCTGACCG GGGCGCTGTT CAAGATCGAC 1200
 ATCCGCGGTG TGGGCAACGT CGCTTTGAAG GAGAAGTGGG CCGCAGGGCC ACGCACCTAC 1260
 CTGGGACTGT CCACCGCCGG GTTCCCCAAC CTGTTCTTCA TCGCAGGCC GGGCAGCTTT 1320
 GGTGCGACGC AGAACATGCT GGTCTCTATC GAACAGCACG TGGAATGGGT GACCGACCAC 1380
 20 ATCGCCTACA TGTTCAAGAA CGGCCTCACC CGATCCGAGG CAGTCCTGGA GAAAGAAGAC 1440
 GAGTGGGTGG AGCACGTCAA CGAGATCGCC GACGAAACCC TCTACCCCAT GACCGCCTCG 1500
 TGGTACACGG GCGCCAACGT CCCCAGTAAA CCCCAGGTGT TCATGCTCTA CGTCGGCGGC 1560
 TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
 CTCACCTAG

25

<110> Pontificia Universidad Católica de Chile

<120> Mutante codificante para variante PW
 (Q93N/P94D/P440F/A442P/L443W)

30

<160> 27

<210> SEQ ID No.:29

<211> 1629

<212> ácido nucleico

<213> Mutante codificante para variante PW
(Q93N/P94D/P440F/A442P/L443W)

5

<400>

	ATGGCCGGGC	AGACGACTGT	CGACTCTCGC	CGACAACCAC	CAGAGGAAGT	GGACGTCTCTG	60
	GTCGTGGGAG	CCGGCTTCTC	CGGCCTGTAC	GCCCTCTACC	GTCTGCGGGA	ACTCGGGCGT	120
	AGCGTGACG	TCATCGAAAC	CGCTGGCGAC	GTGGGCGGTG	TGTGGTACTG	GAACCGCTAC	180
10	CCGGGGGCGC	GGTGCGACAT	CGAGAGCATC	GAGTACTGCT	ACTCGTTCTC	CGAGGAGGTC	240
	CTCCAAGAGT	GGAAGTGGAC	TGAGCGGTAC	GCTTCCAATG	ATGAGATCCT	GCGCTACATC	300
	AACTTCGTCG	CCGACAAATT	CGACCTGCGG	AGCGGAATCA	CCTTCCACAC	CACGGTGACC	360
	GCGGCAGCCT	TCGACGAGGC	CACCAACACG	TGGACGGTCG	ACACCAACCA	CGGCGACCGG	420
	ATCCGCGCCC	GCTACCTCAT	CATGGCCAGC	GGCCAGCTCT	CCGTCCCGCA	GCTCCCCAAC	480
15	TTCCCAGGGC	TCAAAGACTT	CGCCGGCAAC	CTCTACCACA	CCGGGAAGT	GCCGCACGAG	540
	CCCGTGGACT	TCTCCGGGCA	GCGGGTGGGC	GTGATCGGCA	CCGGGTCGTC	CGGAATCCAG	600
	GTGAGCCCAC	AGATCGCGAA	ACAGGCTGCG	GAACTGTTCG	TGTTCCAGCG	CACCCCCAC	660
	TTTGCCGTCC	CCGCCCACAA	CGCGCCGCTC	GACCCGAGT	TCCTCGCCGA	CCTGAAGAAG	720
	CGCTACGCCG	AATTCCGGGA	AGAGTCCCGC	AACACTCCCG	GAGGAACCCA	CCGCTACCAG	780
20	GGGCCGAAGT	CCGCGCTGGA	AGTCAGCGAC	GAAGAGCTGG	TGGAAACCCT	GGAACGCTAC	840
	TGGCAGGAGG	GCGGCCCCGA	CATTCTGGCC	GCCTACCGCG	ACATCCTGCG	CGACCGGGAC	900
	GCCAACGAAC	GGGTCGCTGA	ATTTCATCCG	AACAAGATCC	GCAACACCGT	GCGCGACCCG	960
	GAGGTGGCGG	AACGCCTGGT	CCCCAAGGGC	TACCCGTTCG	GCACCAAGCG	CCTCATCTCTG	1020
	GAAATCGACT	ACTACGAAAT	GTTCAACCGG	GACAACGTGC	ACCTGGTCGA	CACGTTGTCT	1080
25	GCGCCGATCG	AGACGATCAC	GCCGCGCGGG	GTGCGCACCT	CGGAACGGGA	GTACGAATC	1140
	GACTCCCTGG	TGCTGGCGAC	CGGGTTCGAC	GCGCTGACCG	GGGCGCTGTT	CAAGATCGAC	1200
	ATCCGCGGTG	TGGGCAACGT	CGCTTTGAAG	GAGAAGTGGG	CCGCAGGGCC	ACGCACCTAC	1260
	CTGGGACTGT	CCACCGCCGG	GTTCCCCAAC	CTGTTCTTCA	TCGCAGGCCC	GGGCAGCTTT	1320
	TCTCCGTGGA	GCAACATGCT	GGTCTCTATC	GAACAGCACG	TGGAATGGGT	GACCGACCAC	1380
30	ATCGCCTACA	TGTTCAAGAA	CGGCCTCACC	CGATCCGAGG	CAGTCCTGGA	GAAAGAAGAC	1440
	GAGTGGGTGG	AGCACGTCAA	CGAGATCGCC	GACGAAACCC	TCTACCCCAT	GACCGCCTCG	1500
	TGGTACACGG	GCGCCAACGT	CCCCGGTAAA	CCCCGGGTGT	TCATGCTCTA	CGTCGGCGGC	1560

TTCCACCGCT ACCGGCAGAT CTGCGACGAG GTGGCTGCCA AGGGCTACGA AGGTTTCGTC 1620
CTCACCTAG