

Sequence Listing 513-15 PCT.txt  
SEQUENCE LISTING

<110> ProBioGen AG

<120> Cell Line for Propagation of Highly Attenuated Alphaviruses

<140>

<141> 2009-06-25

<150> US 61/133,024

<151> 2008-06-25

<160> 21

<170> PatentIn version 3.3

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<210> 2

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<223> E1B Cassette

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 <213> Artificial

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 <223> SIN Capsid

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

Val Ser Ala Leu Val Ile Gly Gln Ala Thr Arg Pro Gln Pro Pro Arg  
 50 55 60

Pro Arg Pro Pro Pro Arg Gln Lys Lys Gln Ala Pro Lys Gln Pro Pro  
 65 70 75 80

Lys Pro Lys Lys Pro Lys Thr Gln Glu Lys Lys Lys Lys Gln Pro Ala  
 85 90 95

Lys Pro Lys Pro Gly Lys Arg Gln Arg Met Ala Leu Lys Leu Glu Ala  
 100 105 110

Asp Arg Leu Phe Asp Val Lys Asn Glu Asp Gly Asp Val Ile Gly His  
 115 120 125

Ala Leu Ala Met Glu Gly Lys Val Met Lys Pro Leu His Val Lys Gly  
 130 135 140

Thr Ile Asp His Pro Val Leu Ser Lys Leu Lys Phe Thr Lys Ser Ser  
 145 150 155 160

Ala Tyr Asp Met Glu Phe Ala Gln Leu Pro Val Asn Met Arg Ser Glu  
 165 170 175

Ala Phe Thr Tyr Thr Ser Glu His Pro Glu Gly Phe Tyr Asn Trp His  
 180 185 190

His Gly Ala Val Gln Tyr Ser Gly Gly Arg Phe Thr Ile Pro Arg Gly  
 195 200 205

Val Gly Gly Arg Gly Asp Ser Gly Arg Pro Ile Met Asp Asn Ser Gly  
 210 215 220

Arg Val Val Ala Ile Val Leu Gly Gly Ala Asp Glu Gly Thr Arg Thr

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225 230 235 240

Ala Leu Ser Val Val Thr Trp Asn Ser Lys Gly Lys Thr Ile Lys Thr  
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Arg Ala Leu Asp Ile Leu Glu Glu Asn Val Asn His Glu Ala Tyr Asp  
35 40 45

Thr Leu Leu Asn Ala Ile Leu Arg Cys Gly Ser Ser Gly Arg Ser Lys  
50 55 60

Arg Ser Val Thr Asp Asp Phe Thr Leu Thr Ser Pro Tyr Leu Gly Thr  
65 70 75 80

Cys Ser Tyr Cys His His Thr Glu Pro Cys Phe Ser Pro Val Lys Ile  
85 90 95

Glu Gln Val Trp Asp Glu Ala Asp Asp Asn Thr Ile Arg Ile Gln Thr  
100 105 110

Ser Ala Gln Phe Gly Tyr Asp Gln Ser Gly Ala Ala Ser Ala Asn Lys  
115 120 125

Tyr Arg Tyr Met Ser Leu Lys Gln Asp His Thr Val Lys Glu Gly Thr  
130 135 140

Met Asp Asp Ile Lys Ile Ser Thr Ser Gly Pro Cys Arg Arg Leu Ser  
145 150 155 160

Tyr Lys Gly Tyr Phe Leu Leu Ala Lys Cys Pro Pro Gly Asp Ser Val  
165 170 175

Thr Val Ser Ile Val Ser Ser Asn Ser Ala Thr Ser Cys Thr Leu Ala  
180 185 190

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Arg Lys Ile Lys Pro Lys Phe Val Gly Arg Glu Lys Tyr Asp Leu Pro  
195 200 205

Pro Val His Gly Lys Lys Ile Pro Cys Thr Val Tyr Asp Arg Leu Lys  
210 215 220

Thr Thr Ala Gly Tyr Ile Thr Met His Arg Pro Gly Pro His Ala Tyr  
225 230 235 240

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

Ser Gly Lys Asn Ile Thr Tyr Glu Cys Lys Cys Gly Asp Tyr Lys Thr  
260 265 270

Arg Thr Val Ser Thr Arg Thr Glu Ile Thr Gly Cys Thr Ala Ile Lys  
275 280 285

Gln Cys Val Ala Tyr Lys Ser Asp Gln Thr Lys Trp Val Phe Asn Ser  
290 295 300

Pro Asp Leu Ile Arg His Asp Asp His Thr Ala Gln Gly Lys Leu His  
305 310 315 320

Leu Pro Phe Lys Leu Ile Pro Ser Thr Cys Met Val Pro Val Ala His  
325 330 335

Ala Pro Asn Val Ile His Gly Phe Lys His Ile Ser Leu Gln Leu Asp  
340 345 350

Thr Asp His Leu Thr Leu Leu Thr Thr Arg Arg Leu Gly Ala Asn Pro  
355 360 365

Glu Pro Thr Thr Glu Trp Ile Val Gly Lys Thr Val Arg Asn Phe Thr  
370 375 380

Val Asp Arg Asp Gly Leu Glu Tyr Ile Trp Gly Asn His Glu Pro Val  
385 390 395 400

Arg Val Tyr Ala Gln Glu Ser Ala Pro Gly Asp Pro His Gly Trp Pro  
405 410 415

His Glu Ile Val Gln His Tyr Tyr His Arg His Pro Val Tyr Thr Ile  
420 425 430

Leu Ala Val Ala Ser Ala Thr Val Ala Met Met Ile Gly Val Thr Val  
435 440 445

Ala Val Leu Cys Ala Cys Lys Ala Arg Arg Glu Cys Leu Thr Pro Tyr  
450 455 460

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Ala Leu Ala Pro Asn Ala Val Ile Pro Thr Ser Leu Ala Leu Leu Cys  
465 470 475 480

Cys Val Arg Ser Ala Asn Ala Glu Thr Phe Thr Glu Thr Met Ser Tyr  
485 490 495

Leu Trp Ser Asn Ser Gln Pro Phe Phe Trp Val Gln Leu Cys Ile Pro  
500 505 510

Leu Ala Ala Phe Ile Val Leu Met Arg Cys Cys Ser Cys Cys Leu Pro  
515 520 525

Phe Leu Val Val Ala Gly Ala Tyr Leu Ala Lys Val Asp Ala Tyr Glu  
530 535 540

His Ala Thr Thr Val Pro Asn Val Pro Gln Ile Pro Tyr Lys Ala Leu  
545 550 555 560

Val Glu Arg Ala Gly Tyr Ala Pro Leu Asn Leu Glu Ile Thr Val Met  
565 570 575

Ser Ser Glu Val Leu Pro Ser Thr Asn Gln Glu Tyr Ile Thr Cys Lys  
580 585 590

Phe Thr Thr Val Val Pro Ser Pro Lys Ile Lys Cys Cys Gly Ser Leu  
595 600 605

Glu Cys Gln Pro Ala Val His Ala Asp Tyr Thr Cys Lys Val Phe Gly  
610 615 620

Gly Val Tyr Pro Phe Met Trp Gly Gly Ala Gln Cys Phe Cys Asp Ser  
625 630 635 640

Glu Asn Ser Gln Met Ser Glu Ala Tyr Val Glu Leu Ser Ala Asp Cys  
645 650 655

Ala Ser Asp His Ala Gln Ala Ile Lys Val His Thr Ala Ala Met Lys  
660 665 670

Val Gly Leu Arg Ile Val Tyr Gly Asn Thr Thr Ser Phe Leu Asp Val  
675 680 685

Tyr Val Asn Gly Val Thr Pro Gly Thr Ser Lys Asp Leu Lys Val Ile  
690 695 700

Ala Gly Pro Ile Ser Ala Ser Phe Thr Pro Phe Asp His Lys Val Val  
705 710 715 720

Ile His Arg Gly Leu Val Tyr Asn Tyr Asp Phe Pro Glu Tyr Gly Ala  
725 730 735

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Met Lys Pro Gly Ala Phe Gly Asp Ile Gln Ala Thr Ser Leu Thr Ser  
740 745 750

Lys Asp Leu Ile Ala Ser Thr Asp Ile Arg Leu Leu Lys Pro Ser Ala  
755 760 765

Lys Asn Val His Val Pro Tyr Thr Gln Ala Ala Ser Gly Phe Glu Met  
770 775 780

Trp Lys Asn Asn Ser Gly Arg Pro Leu Gln Glu Thr Ala Pro Phe Gly  
785 790 795 800

Cys Lys Ile Ala Val Asn Pro Leu Arg Ala Val Asp Cys Ser Tyr Gly  
805 810 815

Asn Ile Pro Ile Ser Ile Asp Ile Pro Asn Ala Ala Phe Ile Arg Thr  
820 825 830

Ser Asp Ala Pro Leu Val Ser Thr Val Lys Cys Glu Val Ser Glu Cys  
835 840 845

Thr Tyr Ser Ala Asp Phe Gly Gly Met Ala Thr Leu Gln Tyr Val Ser  
850 855 860

Asp Arg Glu Gly Gln Cys Pro Val His Ser His Ser Ser Thr Ala Thr  
865 870 875 880

Leu Gln Glu Ser Thr Val His Val Leu Glu Lys Gly Ala Val Thr Val  
885 890 895

His Phe Ser Thr Ala Ser Pro Gln Ala Asn Phe Ile Val Ser Leu Cys  
900 905 910

Gly Lys Lys Thr Thr Cys Asn Ala Glu Cys Lys Pro Pro Ala Asp His  
915 920 925

Ile Val Ser Thr Pro His Lys Asn Asp Gln Glu Phe Gln Ala Ala Ile  
930 935 940

Ser Lys Thr Ser Trp Ser Trp Leu Phe Ala Leu Phe Gly Gly Ala Ser  
945 950 955 960

Ser Leu Leu Ile Ile Gly Leu Met Ile Phe Ala Cys Ser Met Met Leu  
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<211> 2717  
<212> DNA

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<213> Artificial

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<223> EF2 and VEE UTR up to ATG

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 <211> 251  
 <212> DNA  
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<220>  
 <223> VEE 3' UTR and HDV

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 <212> DNA  
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<220>  
 <223> VEE sg

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<210> 9  
 <211> 7521  
 <212> DNA  
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 <223> VEE nsP and SIN Packaging Signal

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 agagcgtttt cgcatctggc ttcaaaactg atcgaaacgg aggtggaccc atccgacacg 180  
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Sequence Listing 513-15 PCT.txt

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Sequence Listing 513-15 PCT.txt

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Sequence Listing 513-15 PCT.txt

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<220>
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Sequence Listing 513-15 PCT.txt

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21

17