

TECHNICAL SUPPORT

Toll free (US): 888-457-5873
 Outside US: (+1) 858-457-5873
 E-mail: info@invivogen.com
 Website: www.invivogen.com



3950 Sorrento Valley Blvd. Suite A
 San Diego, CA92121 - USA

Bsp120I (7)
SdaI (6) SpeI (13)
1 CCTGCAGGGCCCACTAGTqAACGGAGGGTTGTGAGGAGAGTGAGAGGTGGACAGAGGGCACCGACGATTTAGCATCTCTTCTCTCTCTGGGGTTCGAGGA

BsrGI (179)
SphI (176)
101 TGAGAGACAAAAAGAAGCTGCCAGGAAACATAAAATTTCAGAGGGCTCAGCTGCAGGGCTGAGGTCTGCAAGCATGCTGTGTACACTTGTGCATGTTGTG

EcoNI (206)
201 CCCTGCACAAGGGCATCTCTGAAGGGGCTGCAC TGGACCCAGGGGCGAGGGGCGAAAGGTGAGTTTATATCAGTTCCTGAGCACTGTGGCTCCATCCAGC

301 ACTCTGAGGACAGGCAGGATACAGCTGGAGGACCTGAGGGCTCCCCACACCAGCTCCTGTTCCCTGCCAAGACCCCTGGACCTGCAGACAACAATTC

401 AACGCACTCAGAGTCCCACAGTTAAGAAGCTCCCTGAAGAAGCCCCAGTGGCTGCGTGGTGGATTTTCGCAAAGCTGTCTCCACCTACATCCACCCTGTT

StuI (542)
501 TGGCAGCCCCTACATACTTTTCACAGCATGAGGAAGGGAGGCCTCTCACCAAGACCTGGACTGAATCTTCTCCAGTGGCTGCCACACCTGACCTGCTC

Bsp120I (687)
601 TTGCTCCAGAACCCTGTGGCTCCCATCTCCACAGGGTCAACTTCCAACATGGCTGCCTGCACTCCAGCCAAGAGGGCTGTGCTCTGGGCCCCCTCCAGAT

PshAI (704)
701 GCCTGACCTGGGTCTGTGGCTGCCCTGTCTTCTTCAGTGCTCTCTTCCCGTGGGTGAGGAATAGTTCAGGACAGAGGAGCTAAGTTCAGGTTTCATTC

801 ATAGGACAGGTGCCTATTTCTGCTCACGGCCAGGAATAGAGACTTGCCGGGCTCGGCCCTTCGGGGAGTTGGCAGACGGCAGAGGGGAGGCTGGCTGGCC

AgeI (913)
SgrAI (913)
901 CAGGGGATGACCACCGGTGGGTAAGCACAGACAGAGGGGAGCACAGGCTTCCCCAGAAGACTGAGAGGCCCCAGAGGCATCCACAGAGGACCCAG

EcoNI (1064) SandI (1068) SandI (1096)
1001 CTGTGCTGCCAAGCTGGGGCAGCCCAAACCTTAGCGGCCAGCTGACAAAAGCTGCCCTCCCCAGGGTCCCCGGAGAGCTGGTGCCTCCCTGGGT

Tth111I (1201)
1101 CCAAATTTGCATGGCAGGAAGGGCTGGTGAGGAAGAGCGGGGAGGGGACAGGCTGCAGCCGGTGCAGTTACACGTTTTCTCCAAGGAGCCTCGGAC

NcoI (1237)
BstEII (1232) NheI (1275)
1201 GTTGTACGGGTTTGGGGTGGGGACAGAGCGGTGACCATGGGGGTTCTCATCATCATCATCATGGTATGGCTAGCATGACTGGTGGCAGCAAAAT

Me tGl yGl ySer Hi sHi sHi sHi sHi sHi sGl yMe tAl aSer Me tThr Gl yGl yGl nGl nMe
Acc65I (1331)
1301 GGGTCCGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGAGGTTGATCCCGTCTTTTACAACGTCGTGACTGGGAAAACCTGGCGTT

21> tGl yArg AspLeu Tyr Asp Asp Asp Asp Lys Val P roLys Asp Gl nLeu Gl yVal Asp P roVal Val Leu Gl nArg Arg Asp T rp Gl uAsn P ro Gl yVal

FspI (1491)
1401 ACCCAACTTAATCGCCTTGACGACATCCCCCTTCGCCAGCTGGCGTAATAGCGAAGAGGCCGACCGATCGCCCTCCCAACAGTTGCGCAGCTGA

55> Thr Gl nLeu Asn Arg Leu Al aAl aHi sP roP roPhe Al aSer T rp Arg Asn Ser Gl uGl uAl aArg Thr Asp Arg P roSer Gl nGl nLeu Arg Ser Leu A

1501 ATGGCGAATGGCGCTTTGCTGTTCCGGCACCAGAAGCGGTGCCGGAAGCTGGCTGGAGTGCATCTTCTGAGGCCGATCTGCTGCTGCCCTC

88> snGl yGl uT rp Arg Phe Al aT rp Phe P roAl aP ro Gl uAl aVal P ro Gl uSer T rp Leu Gl uCys Asp Leu P ro Gl uAl aAsp Thr Val Val P roSe

1601 AAAGTGGCAGATGACGGTTACGATGCGCCATACACCAAGCTAACCTATCCATTACCGTCAATCCGCGTTGTTCCACGGAGAATCCGACGGGT

121> rAsn T rp Gl nMe tHi sGl yTyr Asp Al aP ro l l eTyr Thr Asn Val Thr Tyr P ro l l eThr Val Asn P roP roPhe Val P roThr Gl uAsn P roThr Gl y

1701 TGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGCCAGACGCGAATATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGTGA

155> Cys Tyr Ser Leu Thr Phe Asn Val Asp Gl uSer T rp Leu Gl nGl uGl yGl nThr Arg l l e l l ePhe Asp Gl yVal Asn Ser Al aPhe Hi sLeu T rp Cys A

1801 ACGGGCGTGGGTGCGTTACGGCCAGGACAGTCTGTTGCCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGT

188> snGl yArg T rp Val Gl yTyr Gl yGl nAsp Ser Arg Leu P roSer Gl uPhe Asp Leu Ser Al aPhe Leu Arg Al aGl yGl uAsn Arg Leu Al aVal Me tVa

AatII (1972)
1901 GCTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTGTTGCTGCATAAACCGACTACACAA

221> lLeu Arg T rp Ser Asp Gl ySer Tyr Leu Gl uAsp Gl nAsp Me tT rp Arg Me tSer Gl y l l ePhe Arg Asp Val Ser Leu Leu Hi sLys P roThr Thr Gl n

2001 ATCAGCGATTTCCATGTTGCCACTCGCTTAAATGATGATTTACGCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGGAGGTTGCGTGACTACCTAC

255> l l eSer Asp Phe Hi sVal Al aThr Arg Phe Asn Asp Asp Phe Ser Arg Al aVal Leu Gl uAl aGl uVal Gl nMe tCys Gl yGl uLeu Arg Asp Tyr Leu A

ClaI (2173)
2101 GGGTAACAGTTTCTTATGGCAGGGTGAACGCAGGTCGCCAGCGGCACCGCCCTTTCGGCGGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCG

288> r gVal Thr Val Ser Leu T rp Gl nGl yGl uThr Gl nVal Al aSer Gl yThr Al aP roPhe Gl yGl yGl u l l e l l eAsp Gl uArg Gl yGl yTyr Al aAsp Ar

2201 CGTCACACTACGCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGGGTGGTTGAACTGCACACCCGACGGCAGC

321> gVal Thr Leu Arg Leu Asn Val Gl uAsn P roLys Leu T rp Ser Al aGl u l l eP roAsn Leu Tyr Arg Al aVal Val Gl uLeu Hi sThr Al aAsp Gl yThr

2301 CTGATTGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTGAGGGCGTTA

355> Leu l l eGl uAl aGl uAl aCys Asp Val Gl yPhe Arg Gl uVal Arg l l eGl uAsn Gl yLeu Leu Leu Leu Asn Gl yLys P roLeu Leu l l eArg Gl yVal A

EcoRV (2462)
2401 ACCGTCACGAGCATCATCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACCTTAAACCGCTGCG

388> snArg Hi sGl uHi sHi sP roLeu Hi sGl yGl nVal Me tAsp Gl uGl nThr Me tVal Gl nAsp l l eLeu Leu Me tLys Gl nAsn Asn Phe Asn Al aVal Ar

DraIII (2539) SspI (2579)
2501 CTGTTCCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGGCAGCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTG

421> gCys Ser Hi sTyr P roAsn Hi sP roLeu T rp Tyr Thr Leu Cys Asp Arg Tyr Gl yLeu Tyr Val Val Asp Gl uAl aAsn l l eGl uThr Hi sGl yMe tVal

BsaBI (2675)
2601 CCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGCGATGAGCGAACGCTAACCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCA

455> P roMe tAsn Arg Leu Thr Asp Asp P roArg T rp Leu P roAl aMe tSer Gl uArg Val Thr Arg Me tVal Gl nArg Asp Arg Asn Hi sP roSer Val l l e l

2701 TCTGGTCGCTGGGAAAGAAICAGGCCACGGCGCAAIACACGACGCGCIGTAICGCTGGATCAAATCIGTCGATCCITCCCGCCCGGIGCAGIAIGAAGG
488▶ IeTrpSerLeuGlyAsnGluSerGlyHisGlyAlaAsnHisAspAlaLeuTyrArgTrpIleLysSerValAspProSerArgProValGlnTyrGluGly
BssHII (2847)
2801 CGGCGGAGCCGACACCACGGCCACCGATATTATTTGCCGATGTACGGCGCGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCAA
521▶ yGlyGlyAlaAspThrThrAlaThrAspIleIleCysProMetTyrAlaArgValAspGluAspGlnProPheProAlaValProLysTrpSerIleLys
2901 AAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCCAATACGCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGG
555▶ LysTrpLeuSerLeuProGlyIleThrArgProLeuIleLeuCysGlyTyrAlaHisAlaMetGlyAsnSerLeuGlyPheAlaLysTyrProGlnA
3001 CGTTTCGTCAGTATCCCGTTCACAGGGCGGCTTCGCTGGGACTGGTGGATCAGTCTGATTAAATATGATGAAAACGGCAACCCGTTGGTCGGCTTA
588▶ IAPheArgGlnTyrProArgLeuGlnGlyPheValTrpAspTrpValAspGlnSerLeuIleLysTyrAspGluAsnGlyAsnProTrpSerAlaTy
Eco47III (3184)
3101 CGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGATCCAGCGCTGACGGAAGCAAAA
621▶ rGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGlyLeuValPheAlaAspArgThrProHisProAlaLeuThrGluAlaLys
SacI (3289)
3201 CACCAGCAGCAGTTTTTCCAGTTCGGTTATCCGGGCAAAACCATCGAAGTGACCAGCGAATACCTGTTCGTCATAGCGATAACGAGCTCCTGCACTGGA
655▶ HisGlnGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrIleGlyValIleThrSerGlyTyrLeuPheArgHisSerAspAsnGluLeuLeuHisTrpM
3301 TGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCGGATGTCGCTCCACAAGGTAACAGTTGATTGAACCTGCTGAACCTCCGACGCC
688▶ etValAlaLeuAspGlyLysProLeuAlaSerGlyGlyValProLeuAspValAlaProGlnGlyLysGlnLeuIleGlyLeuProGluLeuProGlnP
3401 GGAGAGCGCCGGCAACTCTGGCTCACAGTACGCTAGTGCAACCGAACGCGACCGCATGGTCAAGAGCCGGGCACATCAGCGCTGGCAGCAGTGGCGT
721▶ oGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAlaThrAlaTrpSerGluAlaGlyHisIleSerAlaTrpGlnGlnTrpArg
3501 CTGGCGAAAACCTCAGTGTGACGCTCCCGCGCGCTCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTGCATCGAGCTGGGTAATAAGC
755▶ LeuAlaGluAsnLeuSerValThrLeuProAlaAlaSerHisAlaIleProHisLeuThrThrSerGluMetAspPheCysIleGlyLeuGlyAsnLysA
3601 GTTGGCAATTTAACCGCCAGTCAGGCTTCTTTCACAGATGTGGATTGGCGATAAAAAACAAGTCTGACGCCGCTGCGCGATCAGTTCAACCGTGACC
788▶ rGTrpGlnPheAsnArgGlnSerGlyPheLeuSerGlnMetTrpIleGlyAspLysLysGlnLeuLeuThrProLeuArgAspGlnPheThrArgAlaPr
3701 GCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCTAACGCTGGGTCGAACGCTGGAAGGGCGGGCCATTACCAGGCCGAAGCAGCG
821▶ oLeuAspAsnAspIleGlyValSerGluAlaThrArgIleAspProAsnAlaTrpValGluArgTrpLysAlaAlaGlyHisTyrGlnAlaGluAlaAla
3801 TTGTTGACAGTGCACGGCAGATACACTTGTCTGATGCGGTGCTGATTACGACCGCTCACGCTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGAAAA
855▶ LeuLeuGlnCysThrAlaAspThrLeuAlaAspAlaValLeuIleThrThrAlaHisAlaTrpGlnHisGlnGlyLysThrLeuPheIleSerArgLysT
3901 CCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCAGCGATACACCGCATCCGGCGGGATTGGCTGAACCTGCCAGCT
888▶ hrTyrArgIleAspGlySerGlyGlnMetAlaIleThrValAspValGluValAlaSerAspThrProHisProAlaArgIleGlyLeuAsnCysGlnLe
4001 GGGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAATATCCGACCGCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCA
921▶ uAlaGlnValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAsnTyrProAspArgLeuThrAlaAlaCysPheAspArgTrpAspLeuPro
Bst1107I (4111)
BspLU11I (4108) BsiWI (4119)
4101 TTGTCAGACATGTATACCCCGTACGCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCAATTGAATTATGGCCACACCAGTGGCGGGCGACT
955▶ LeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArgCysGlyThrArgGluLeuAsnTyrGluProHisGlnTrpArgGlyAspP
4201 TCCAGTTC AACATCAGCCGCTACAGTCAACAGCACTGATGAAAACGACCCATCGCCATCTGCTGCACGCGAAGAACGCACATGGCTGAATATCGACGG
988▶ heGlnPheAsnIleSerArgTyrSerGlnGlnGlnLeuMetGlyThrSerHisArgHisLeuLeuHisAlaGlyGlyGlyThrTrpLeuAsnIleAspGly
NdeI (4306)
4301 TTTCCATATGGGGATTGGTGGCGACGACTCCTGGAGCCGTCAGTATCGCGGAATTACAGCTGAGCGCGGTCGCTACCATTACCAGTTGGTCTGGTGT
1021▶ yPheHisMetGlyIleGlyGlyAspAspSerTrpSerProSerValSerAlaGluLeuGlnLeuSerAlaGlyArgTyrHisTyrGlnLeuValTrpCys
NheI (4428)
EcoRI (4422)
4401 CAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGATACATTGATGAGTTTGGACAAACCACAACCTAGAATGCAGTAAAAAATGCTT
1055▶ GlnLys...
4501 TATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAAGTTAAACAACA

MfeI (4602) DraI (4651) DraI (4690) SmaI (4693)
4601 ACAATTGCATTCATTTTATGTTTCAGGTTACAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTAGATCCATTTAAATGTT
4701 AATTAAGTACCATGACCAAAATCCCTAACGTGAGTTTTCTGTTCCACTGAGCGTCAGACCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT
4801 TTCTGCGGTAATCTGCTGCTTGCAAAACAAAAAACCCGCTACCAGCGGTGTTTTGTTTCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAC
4901 TGGCTTACGAGAGCGCAGATACAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCCTCAAGAACTCTGTAGCACCGCTACATACCTCGCT
5001 CTGCTAATCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGGCGAGCGGTCCG
5101 GCTGAACGGGGGTTCTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCC
5201 CGAAGGGAGAAAGCGGACAGGTATCCGGTAAGCGGAGGTCGGAACAGGAGAGCGCAGGGGAGCTTCCAGGGGAAACCGCTGGTATCTTTATAGT
5301 CCTGTCGGGTTTCCGCACCTGACTTGAGCGTCGATTTTTGTGATGCTGCTCAGGGGGCGGAGCCTATGAAAAACGCCAGCAACCGCGCTTTTTAC

BspLU11I (5431) AseI (5469)
5401 GGTTCTGGCCTTTTGTGGCCTTTTGTCACTGTTCTTAATTAATTTTTCAAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTAT

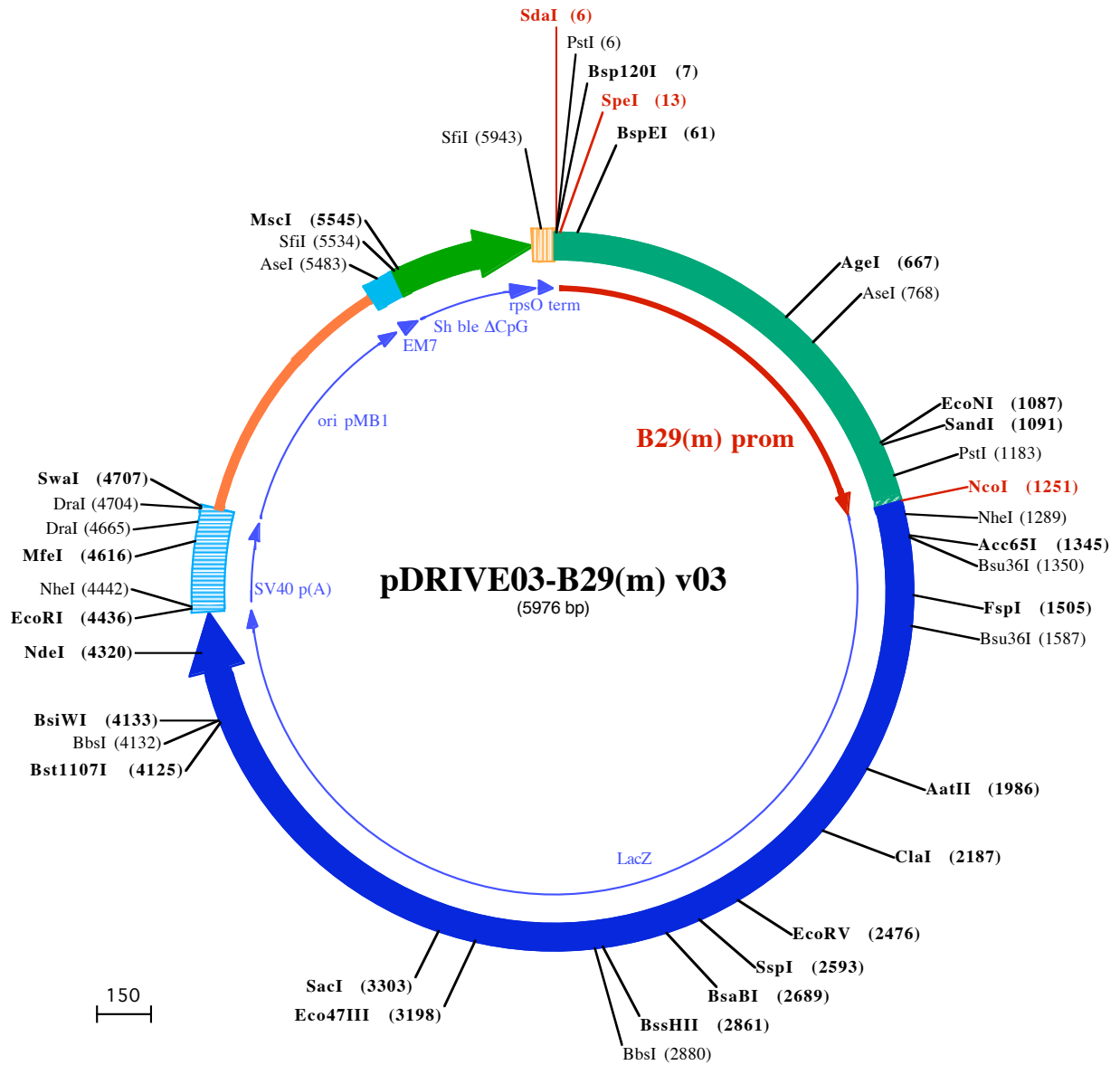
SfiI (5520) MseI (5531)
5501 AATACGACTCACTATAGGAGGCCATCATGGCCAAGTTGACCAAGTGTCCAGTGTCCAGCTCACAGCCAGGGATGTGGCTGGAGCTGTTGAGTTCTGGACT
1▶ MetAlaLysLeuThrSerAlaValProValLeuThrAlaArgAspValAlaGlyAlaValGluPheTrpThr
5600 GACAGTTGGGGTCTCCAGAGATTTTGTGGAGATGACTTTGCAAGTGTGGTCAGAGATGATGTCACCTGTTTCATCTCAGCAGTCCAGGACCAGGTGG
25▶ AspArgLeuGlyPheSerArgAspPheValGluAspAspPheAlaGlyValValArgAspAspValThrLeuPheIleSerAlaValGlnAspGlnValV
5700 TGCTGACAACACCTGGCTTGGTGTGGTGGAGGACTGGATGAGCTGTATGCTGAGTGGAGTGGTGGTCTCCACCAACTTCAGGGATGCCAGTGG
58▶ alProAspAsnThrLeuAlaTrpValTrpValArgGlyLeuAspGluLeuTyrAlaGluTrpSerGluValValSerThrAsnPheArgAspAlaSerGly
DraIII (5881)
5800 CCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGAGAGAGTTTCCCTGAGAGACCAGCAGGCAACTGTGTGCATTTTGGCAGAGGAGCAGGAC

91 yProAl aMet Thr GI ul l eGI yGI uGI nPro I rpGI yA rgGI uPheAl aLeuArgAspP roAl aGI yAsnCysVal Hi sPheVal Al aGI uGI uGI nAsp
SfiI (5929)

5900 TGA GGATAAGAATTGAGTTTCAGAAAAGGGGGCCTGAGTGGCCCTTTTTCAACTTAATTAA

125 ▶ ●●●





TECHNICAL SUPPORT
 Toll free (US): 888-457-5873
 Outside US: (+1) 858-457-5873
 E-mail: info@invivogen.com
 Website: www.invivogen.com

InvivoGen
 3950 Sorrento Valley Blvd. Suite A
 San Diego, CA92121 - USA

PstI (6) Bsp120I (7)
SdaI (6) SpeI (13) BspEI (61)

1 CCTGCAGGCCCACTAGTCATGGATGGTTGTGAACCACCATGTGGTTGCTGGGATTTGAACTCCGGACCTTTGAAAAGAAGTCGGTGCTCTTACCCAC

101 TGAACCATCTCACCAGCCCCACAGCAAACCTTTATACAAGAAGAAGAGGGCTGTGTTGAGGGCTAGACTTCATTTTCTTCTCTCTTCTCTCTCTCC

201 TCTTTCTCTTCTTCTTCTTCT

301 TAGCCCTGCCTATCTGAAACTCACTCTATAGACCAGACTGGCCTCAAACCTATAGAAATCCACCTGCCTCTGCCTCCCGAGTGCTAGGATTAAGGCAT

401 GACTCACCACCACCGACTCTGGGCTGATTTTCTTATTTGTTGGCATACTTTTGACAAGAACCTCTATGGCTCCCTTCCCACAGAGCCAACCTTTTG

501 ACATGGCTTCTGTACTCCAAGAAGTTCTACTCTGGACCTCTCCAGGAGCTGGTGTGAGTATGTCTCTGAATTGTCTGTCTCTTGTCTGTATCTCTCTCT

601 AGAGTTAGATAAGGGTTGTCCAGGGCAGAGGAGTCAAGGTCAGATTCAATTAAGTAACAGTTCTCAACCGGTGGTGCATCACCATTAGAGAACACATATT

AgeI (667)

701 TCCAATGGTCTTAGGAACTGAGACACCTCTCAGTAGCAAAATTACAGTTTTGAAGTAGCAACAAAATTAATTTATGTTGGGGTCTCTAAGACCATCA

AseI (768)

801 GAAATGTGTGCACTTGCACCCACAGTTGAAAACCTGCTGATTGAGAAGTTGGTGTGCATTTAGCTAAATTTCCCAGGCCACTCTTCCAGAGCAAGGC

901 AACACAGGAGACCAGCTGACCTAAGAGATGACCACAGTGGACAGAGGGAGTTAGAACACTGGCTGTCCCTAGAAGATTCAGGAGCAACCCCTTCCC

SandI (1091)

1001 AGGGGGTCTCTCAAGAACCCAAAGCTGTGCTACCCAGGCAGGACCACCTTCAGATCCTAGCAGACCAGCTGATGAAGCTGCCTCCCATAGGGTCCCTG

EcoNI (1087)

1101 GAGGGATGGTGCCTCCCTGGGTCTCAATTTGCATGGCAGGAAGGGGCTAATGGGGAAGAGCGGAGAGGAGACAAGCTGCAGCCCAGGCTGACATACA

PstI (1183)

1201 GTTACATGTTTCGCCCCAAACCTCCTTGGGCTCAGAGACAGAGCAGTGACCATGGGGGTTCTCATCATCATCATCATGGTATGGCTAGCATGACT

NcoI (1251) NheI (1289)

MetGI yGI ySer Hi sHi sHi sHi sHi sHi sGI yMe tAl aSer Me tThr

Bsu36I (1350)

1301 GGTGGACAGCAAATGGGTCGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGAGTTGATCCCGTCTTTTACAACGTCGTGACTGGG

17> GI yGI yGI nGI nMe tGI yArg AspLeuTyr AspAspAspAspLysVal P roLys AspGI nLeuGI yVal AspP roVal Val LeuGI nArg ArgAspT rpG

1401 AAAACCTGGCGTTACCAACTTAATCGCTTGACGACATCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCGACCAGTCCGCTTCCCAACA

50> I uAsnP roGI yVal Thr GI nLeuAsnArgLeuAl aAl aHi sP roP roPheAl aSer T rpArgAsnSer GI uGI uAl aArgThr AspArgP roSer GI nGI

FspI (1505) Bsu36I (1587)

1501 GTTGGCAGCCTGAATGGCGAATGGCGCTTTCGCTGGTTCCGGCACCAGAAGCGGTGCCGAAAGCTGGCTGGAGTGCATCTTCTGAGGCCGATACT

83> nLeuArgSer LeuAsnGI yGI uT rpArgPheAl aT rpPheProAl aP roGI uAl aVal P roGI uSer T rpLeuGI uCysAspLeuP roGI uAl aAspThr

1601 GTGTCGTCCTCAAACTGGCAGATGCACGGTTACGATGCGCCATCTACACCAACGTAACCTATCCATTACGGTCAATCCGCCGTTTGTCCACGG

117> Val Val Val P roSerAsnT rpGI nMe tHi sGI yTyrAspAl aP roI l eTyrThrAsnVal Thr TyrP roI l eThr Val AsnP roP roPheVal P roThr G

1701 AGAATCCGACGGGTTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACCGCAATTTTGTATGGCGTTAACTCGGCGTT

150> I uAsnP roThr GI yCysTyrSer LeuThr PheAsnVal AspGI uSer T rpLeuGI nGI uGI yGI nThrArgI l eI l ePheAspGI yVal AsnSer Al aPh

1801 TCATCTGTGGTGCACGGGCGCTGGGTCGGTTACGGCCAGGACAGTCTGTTGCCGTCTGAATTTGACCTGAGCGCATTTTACGCGCCGAGAAAACCGC

183> eHi sLeuT rpCysAsnGI yArgT rpVal GI yTyrGI yGI nAspSer ArgLeuP roSer GI uPheAspLeuSer Al aPheLeuArgAl aGI yGI uAsnArg

AatII (1986)

1901 CTCGCGGTGATGGTCTCGCTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTCCGTGACGTCTCGTGTGCATA

217> LeuAl aVal MetVal LeuArgT rpSerAspGI ySer TyrLeuGI uAspGI nAspMe tT rpArgMe tSer GI yI l ePheArgAspVal Ser LeuLeuHi sL

2001 AACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTAATGATGATTTTCAGCCGCGCTGACTGGAGGCTGAAGTTCAAGATGTGCGCGAGTT

250> ysP roThr Thr GI nI l eSerAspPheHi sValAl aThrArgPheAsnAspAspPheSer ArgAl aVal LeuGI uAl aGI uVal GI nMe tCysGI yGI uLe

ClaI (2187)

2101 GCGTGACTACCTACGGTAACAGTTTCTTTATGGCAGGGTGAACGCAGGTGCGCAGCGGCACCAGCGCTTTCGCGGTTGAAATTATCGATGAGCGTGGT

283> uArgAspTyrLeuArgVal Thr Val Ser LeuT rpGI nGI yGI uThr GI nValAl aSer GI yThrAl aP roPheGI yGI yGI uI l eI l eAspGI uArgGI y

2201 GGTATGCCGATCGCTCACACTACGCTGAACGTCGAAAACCCGAAACTGTGGAGCGCGGAAATCCCGAATCTATCTGTCGGTGGTGAACGACACA

317> GI yTyrAl aAspArgVal Thr LeuArgLeuAsnVal GI uAsnP roLysLeuT rpSerAl aGI uI l eP roAsnLeuTyrArgAl aVal Val GI nLeuHi sT

2301 CCGCCGACGGCAGCTGATTGAAGCAGAAGCCTCGATGTCGGTTCCGCGAGGTGCGGATGAAATGGTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT

350> hr Al aAspGI yThr LeuI l eGI uAl aGI uAl aCysAspVal GI yPheArgGI uVal ArgI l eGI uAsnGI yLeuLeuLeuLeuAsnGI yLysP roLeuLe

EcoRV (2476)

2401 GATTGAGGCGTTAACCGTCACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGAGGATATCTGCTGATGAAGCAGAACAAC

383> uI l eArgGI yVal AsnArgHi sGI uHi sHi sP roLeuHi sGI yGI nVal MetAspGI uGI nThr Me tVal GI nAspI l eLeuLeuMe tLysGI nAsnAsn

SspI (2593)

2501 TTTAACCGCTGCGCTGTTTCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGGACCGCTACGGCTGTATGGTGGATGAAGCCAATATTGAAA

417> PheAsnAl aVal ArgCysSer Hi sTyrP roAsnHi sP roLeuT rpTyrThr LeuCysAspArgTyrGI yLeuTyrVal Val AspGI uAl aAsnI l eGI uT

BsaBI (2689)

2601 CCCACGGCATGGTCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGCGATGAGCGAACCGGTAACCGCAATGGTGCAGCGCATGTAATCA

450> hr Hi sGI yMe tVal P roMe tAsnArgLeuThr AspAspP roArgT rpLeuP roAl aMe tSer GI uArgVal Thr ArgMe tVal GI nArgAspArgAsnHi

2701 CCCGAGTGTATCATCTGGTCTGTTGGGAAATGAATCAGCCACGGCGTAATCAGCAGCGCTGTATCGCTGGATCAAATCTGCTGATCTTCCGCCCCG

483> sP roSer Val I l eI l eT rpSer LeuGI yAsnGI uSer GI yHi sGI yAl aAsnHi sAspAl aLeuTyrArgT rpI l eLysSer Val AspP roSer ArgP ro

BssHIII (2861) BbsI (2880)

2801 GTGCAGTATGAAGCGCGGAGCCGACACCAGCCACCGATATTATTTGCCGATGTACGCGCGTGGATGAAGACAGCCCTTCCCGGCTGTGCCGA

517> Val GI nTyrGI yGI yGI yVal aAspThr Thr Al aThrAspI l eI l eCysP roMe tTyrAl aArgVal AspGI uAsnGI nP roPheP roAl aVal P roI

Val Gl nTyr Gl uGl yGl yGl yAl aAspThr Thr Al aThr Asp I le I eCysP roMet TyrAl aArg Val AspGl uAspGl nP roPheP roAl aVal P roL
2901 AATGGTCCATCAAAAAATGGCTTTCCTACCTGGAGAGACGCGCCGCTGATCTTTGCGAATACGCCACGGATGGTAACAGTCTTGGCGGTTTCGC
550 y s Trp Ser l l eLysLys Trp Leu Ser Leu P roGl yGl u Thr Arg P roLeu l l eLysCysGl u TyrAl aHi sAl aMetGl yAsn Ser LeuGl yGl yPheAl
3001 TAAACTGTCAGGCGTTCCTGCTAGTATCCCGTTCACAGGGCGGCTTCTGCTGGACTGGGTGGATCAGTCTGATTAAATATGATGAAAACGGCAAC
583 aLys Tyr TrpGl nAl aPheArgGl nTyrP roArgLeuGl nGl yGl yPheVal Trp Asp TrpVal AspGl nSer Leu l l eLys Tyr AspGl uAsnGl
Eco47III (3198)

3101 CCGTGGTGGCTTACGGCGGTGATTTTGGCGATACGCCAAGCATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGC
617 Pro Trp Ser Al a Tyr Gl y Gl y Asp Phe Gl y Asp Thr P ro Asn Asp Arg Gl n Phe Cys Me t Asn Gl y Leu Val Phe Al a Asp Arg Thr P ro Hi s P ro Al a L
SacI (3303)

3201 TGACGGAAGCAAAACACACAGCAGAGTTCCTTCAGTTCCTGTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGA
650 eu Thr Gl uAl aLysHi sGl nGl nPhePheGl nPheArgLeuSer Gl yGl nThr l l eGl uVal Thr Ser Gl u TyrLeuPheArgHi sSerAspAsnGl
3301 GCTCCTGCTACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCCACAAGGTAACAGTGGATTGAACTGCCT
683 uLeuLeuHi s Trp Me t Val Al aLeuAspGl yLysP roLeuAl aSer Gl yGl uVal P roLeuAspValAl aP roGl nGl yLysGl nLeu l l eGl uLeuP ro
3401 GAACTACCAGCGAGAGCGCGCGCAACTTGCTCACAGTACGGTAGTGCAACCGAACCGCAGCCGATGGTCAGAAGCCGGCCACATCAGCGCCT
717 Gl uLeuP roGl nP roGl nP roGl nSerAl aGl yGl nLeuTrpLeuThr Val ArgVal Val Gl nP roAsnAl aThrAl aTrpSer Gl uAl aGl yHi s l l eSerAl aT
3501 GGCAGCAGTGGGCTGTCGGCGAAAACCTCAGTGTGACGCTCCCGCGCGTCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTTCATCGA
750 r P gl nGl nTrpArgLeuAl aGl uAsnLeuSer Val Thr LeuP roAl aAl aSer Hi sAl a l l eP roHi sLeuThr Thr Ser Gl uMe tAspPheCys l l eGl
3601 GCTGGTAATAAGCGTTGGCAATTAACGCCAGTCAGGCTTTCCTTCACAGATGTGGATTGGCGATAAAAAAACAACCTGCTGACGCCCGCTGCGCGATCAG
783 uLeuGl yAsnLysArgTrpGl nPheAsnArgGl nSer Gl yPheLeuSer Gl nMe t Trp l l eGl yAspLysLysGl nLeuLeuThr P roLeuArgAspGl n
3701 TTCACCCGTGCACCCTGGATAACGCACATTCGGGTAAGTGAAGCGACCCGCAATTGACCCCTAACGCTGGGTCGAACGCTGGAAGCGCGCCGCGCATTACC
817 Phe Thr Arg Al a P roLeuAspAsnAsp l l eGl yVal Ser Gl uAl a Thr Arg l l eAspP roAsnAl aTrpVal Gl uArgTrpLysAl aAl aGl yHi s TyrG
3801 AGCCGAAGCAGCGTTTGTTCAGTGACGCGCAGATACACTTGCTGATGCGGGTGTCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATT
850 l nAl aGl uAl aAl aLeuLeuGl nCysThrAl aAspThrLeuAl aAspAl aVal Leu l l eThr Thr Al aHi sAl aTrpGl nHi sGl nGl yLysThrLeuPh
3901 TATCAGCCGAAAACCTACCGATTGATGGTAGTGGTCAATGGCATTACCGTTGATGTTGAAGTGGCAGCGATACACCGCATCCGCGCGGATGGC
883 e l l eSer ArgLysThr TyrArg l l eAspGl ySer Gl yGl nMe tAl a l l eThr Val AspVal Gl uValAl aSer AspThr P roHi s P roAl aArg l l eGl y
4001 CTGAAGTGCAGCTGGCGCAGGTAGCAGAGCGGTAACCTGGCTGGATTAGGGCCGAAGAAAACCTATCCGACCGCTTACTGCCGCTGTTTTGACC
917 LeuAsnCysGl nLeuAl aGl nValAl aGl uArgValAsnTrpLeuGl yLeuGl yProGl nGl uAsnTyrP roAspArgLeuThrAl aAl aCysPheAspA

BbsI (4132)

BsiWI (4133)

Bst1107I (4125)

4101 GCTGGATCTGCCATTGTACACATGTATACCCGTCAGTCTTCCGAGCGAAAACGGTCTGCCTGCGGACGCGCAATTGAATTATGGCCCACACCA
950 r G Trp Asp Leu P roLeuSer Asp Me t Tyr Thr P ro Tyr Val Phe P ro Ser Gl uAsnGl yLeuArgCysGl y Thr Arg Gl uLeuAsnTyrGl yProHi sGl
4201 GTGGCGGCGACCTCCAGTTCACATCAGCGCTACAGTCAACAGCAACTGATGAAACCAGCCATCGCCATCTGCTGCACGCGAAGAGGCACATGG
983 nTrpArgGl yAspPheGl nPheAsn l l eSer ArgTyrSer Gl nGl nGl nLeuMe tGl uThr SerHi sArgHi sLeuLeuHi sAl aGl uGl uGl yThr Trp

NdeI (4320)

4301 CTGAATATCGACGGTTCCATATGGGGATTGGTGGCGACGACTCTGGAGCCCCTCAGTATCGCGGAATTACAGCTGAGCGCGCTCTACCATACC
1017 LeuAsn l l eAspGl yPheHi sMe tGl y l l eGl yGl yAspAspSer TrpSer P roSer Val SerAl aGl uLeuGl nLeuSerAl aGl yArgTyrHi sTyrG

NheI (4442)

EcoRI (4436)

4401 AGTGGTCTGGTGTCAAAAATAAATCTAGTCGAGAATTGCTAGCTCGACATGATAAGATACATTGATGAGTTTGACAAAACCACAACCTAGAATGCAG
1050 l nLeuVal TrpCysGl nLys ● ● ●
4501 TGAAAAAATGCTTATTTGTGAATTTGTGATGCTATTGCTTTATTTGTGAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAA

MfeI (4616)

DraI (4665)

4601 ACAAGTTAACAAACAATTGCATTTCATTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAATGTGGTAGA

DraI (4704)

SwaI (4707)

4701 TCCATTTAATGTTAATTAAGTGCATGACAAAAATCCCTAACGTGAGTTTTCTGCCACTGAGCGTCAGACCCCGTGAAGAAAGTCAAAGGATCTTC

4801 TTGAGATCCTTTTTCTGCGGTAATCTGCTGCTTGAACAACAAAACCACCCTACAGCGGTGGTTTTGTTTGGCGATCAAGAGCTACCAACTCTT

4901 TTTCCGAAGTAACTGGCTCAGCAGAGCGCAGATACCAATACTGTTCTTAGTGTAGCCGTAAGTGGCCACCACTCAAGAACTCTGTAGCACCGC

5001 CTACATACCTCGCTCTGTAATCCTGTTACCACTGGCTGCTGCCAGTGGCGATAAGTCGTGCTTACCAGGTTGGACTCAAGACGATAGTTACCGGATAA

5101 GGGCAGCGGTCGGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGAGCGAACGACCTACACCGAAGTGGAGTACCTACAGCGTGAAGTATGAGAA

5201 AGCCACCGTTCACCGAAGGGAAGGGCAGCAGGTATCCGGTAAGCGGCGAGGTCGGAACAGGAGGCGCAGGAGGCTCCAGGGGAAACGCGCT

5301 GGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCCAGGGGGCGAGCCTATGGAAAACGCCAGCAA

AseI (5483)

5401 CGCGGCCTTTTTACGGTTCCTGGCCTTTTCTGCTCAGTTCATGTTCTTAATTAATTTTTCAAAAGTAGTTGACAATTAATCATCGGCATAGTA

SfiI (5534) MseI (5545)

5501 TATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCA T G C C A A G T T G A C C A G T G T C C C A G T G C T C A C A G C C A G G G A T G T G G C T G G A G C T G
1 Met Al aLysLeuThr Ser Al aVal P roVal LeuThrAl aArgAspValAl aGl yAl aV

5600 TTGAGTTCTGGACTGACAGGTTGGGTTCTCCAGAGATTTGTGGAGGATGACTTTGCAGGTGTGGTCAGAGATGATGTACCCTGTTTCATCTCAGCAGT
20 al Gl uPheTrpThrAspArgLeuGl yPheSer ArgAspPheVal Gl uAspAspPheAl aGl yVal Val ArgAspAspVal ThrLeuPhe l l eSerAl aVal

5700 CAGGACCAAGTGGTGCCTGACAAACCCCTGGCTGGGTGGGTGGAGGAGTGGATGAGCTGTATGCTGAGTGGAGGAGTGGCTCCACCACCTTC
53 l Gl nAspGl nVal Val P roAspAsnThrLeuAl aTrpVal TrpVal ArgGl yLeuAspGl uLeuTyrAl aGl uTrpSer Gl uVal Val Ser ThrAsnPhe

5800 AGGATGCCAGTGGCCCTGCATGACAGAGATTGGAGAGCAGCCCTGGGGGAGAGATTTGCCCTGAGAGACCCAGCAGGCAACTGTGTGCATTTTGTGG
87 ArgAspAl aSer Gl yProAl aMe tThr Gl u l l eGl yGl uGl nP roTrpGl yArgGl uPheAl aLeuArgAspP roAl aGl yAsnCysVal Hi sPheValAl a

SfiI (5943)

5900 CAGAGGAGCAGGACTGAGGATAAGAATTGAGTTTCAGAAAAGGGCGCTGAGTGCCCTTTTTTCAACTTAATTTAA
120 l aGl uGl uGl nAsn ● ● ●