



**PvuI (7)**  
**SgfI (6)**
**MfeI (82)**

1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGCAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGTGCCTA  
101 GAGAAGGTGGCGGGGTAACGGAAAGTGATGTCGTGACTGGCTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

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**Psp1406I (203)**
**HindIII (245)**
**Bsu36I (291)**

201 GTGAACGTTCTTTTTTCGCAACGGGTTTCCGCCAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACCGCCGCCGCCCTACCTGAGGCC  
301 GCCATCCACGCCGGTTGAGTCGCGTTCTGCCGCTCCCGCCTGTGGTGCTCCTGAAGTGCCTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

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**NgoMIV (441)**  
**NgoMI (441)**  
**NaeI (441)**

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTCCTGACCCTGCTTGTCTCAACTCTACGCTTTTGTTCGTTT

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**KasI (535)**
**AgeI (552)**
**NcoI (560)**

501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGCGCCCTACCTGAGATCACGGTCACCATGGCAGAGCTGTGCCCTGGCCGAGGAGCTGTCGTG  
**DraIII (636)**
1▶Me tAl aGl uLeuCysP roLeuAl aGl uGl uLeuSer Cy

601 CTCCATCTGCCTGAGCCCTTCAAGGAGCCGGTCAACCTCCGTGCGGCCACAACCTTCTGCGGGTCTGCCTGAATGAGACGTGGCAGTCCAGGGCTCG  
13▶sSer I l eCysLeuGl uP roPhelLysGl uP roVal Thr Thr P roCysGl yHi sAsnPheCysGl ySer CysLeuAsnGl uThr TrpAl aVal Gl nGl ySer

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**PvuII (745)**
**SdaI (789)**

701 CCATACCTGTGCCCGCAGTGCCCGCCGCTTACCAGGCGCGACCGCAGCTGCACAAGAACACGGTGTGTGCAACGTGGTGGAGCAGTTCCTGCAGGCCG  
47▶P roTyrLeuCysP roGl nCysArgAl aVal TyrGl nAl aArgP roGl nLeuHi sLysAsnThr Val l euCysAsnVal l Val Gl uGl nPheLeuGl nAl aA

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**XmaI (806)**  
**SmaI (806)**

801 ACCTGGCCCGGGAGCCACCCGCCGACGTCCTGGACGCCGCCGCCGCCCTCTGCACCAGCCGAATGCCAGGTGGCTGCGACCACTGCCTGAAGGA  
80▶spLeuAl aArgGl uP roP roAl aAspVal TrpThr P roP roAl aArgAl aSer Al aP roSer P roAsnAl aGl nValAl aCysAspHi sCysLeuLysGl  
901 GGCCGCCGTGAAGACGTGCTTGGTGTGCATGGCCTCTTGTGAGGACCTGCAGCCGACTTCGACAGCCCGCCTTCCAGGACCAACCCGCTGCAG  
113▶uAl aAl aVal l eLysThr CysLeuVal l CysMe tAl aSer PheCysGl nGl uHi sLeuGl nP roHi sPheAspSer P roAl aPheGl nAspHi sP roLeuGl n

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**NruI (1008)**

1001 CCGCCGTTCCGACCTGTTGCGCCGAAATGTTCCAGCACAATCGGCTGCGGGAATTTTTCTGCCCGAGCACAGCGAGTGCATCTGCCACATCTGCC  
147▶P roP roVal l ArgAspLeuLeuArgArgLysCysSer Gl nHi sAsnArgLeuArgGl uPhePheCysP roGl uHi sSer Gl uCysl l eCysHi s l l eCysL

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**XemI (1142)**
**Bsu36I (1164)**
**BsrGI (1187)**

1101 TGTTGAGCATAAGACCTGCTCTCCCGCTCCCTGAGCCAGGCCAGCCGACCTGGAGGCCACCCTGAGGCACAAACTAAGTGCATGTACAGTCAGAT  
180▶euVal Gl uHi sLysThr CysSer P roAl aSer LeuSer Gl nAl aSer Al aAspLeuGl uAl aThr LeuArgHi sLysLeuThr Val l Me tTyrSer Gl n l l  
1201 CAACGGGCGTCGAGAGCACTGGATGATGTGAGAAACAGGCAGCAGGATGTGCGGATGACTGCAAAACAGAAAGGTGGAGCAGCTACAACAAAGATACACG  
213▶eAsnGl yAl aSer ArgAl aLeuAspAspVal l ArgAsnArgGl nGl nAspVal l ArgMe tThr Al aAsnArgLysVal l Gl uGl nLeuGl nGl nGl uTyrThr  
1301 GAAATGAAGGCTCTTTGGACGCTCAGAGACCCTCGACAAGGAAGTAAAGGAAGAGGAGAGGTTCAACAGCAAGTTTGACACCAATTTATCAGA  
247▶Gl uMe tLysAl aLeuLeuAspAl aSer Gl uThr Thr Ser Thr ArgLys l l eLysGl uGl uGl uLysArgVal l AsnSer LysPheAspThr l l eTyrGl n l  
1401 TTCTCCTCAAGAAGAAGAGTGAGATCCAGACCTGAAGGAGGAGATTGAACAGAGCCTGACCAAGAGGGATGAGTTTCGAGTTTCTGGAGAAAGCATCAA  
280▶l eLeuLeuLysLysLysSer Gl u l l eGl nThr LeuLysGl uGl u l l eGl uGl nSer LeuThr LysArgAspGl uPheGl uPheLeuGl uLysAl aSer Ly  
1501 ACTGCGAGGAATCTCAACAAAGCCAGTCTACATCCCGAGGTGGAAGTGAACCACAAGCTGATAAAAGGCATCCACCAGAGCACCATAGACCTCAAAAAC  
313▶sLeuArgGl y l l eSer Thr LysP roVal l Tyr l l eP roGl uVal l eLeuAsnHi sLysLeu l l eLysGl y l l eHi sGl nSer Thr l l eAspLeuLysAsn  
1601 GAGCTGAAGCAGTGCATCGGGCGCTCCAGGAGCTCACCCAGTTCCAGTGCAGCTGGAGAGCATGACCCAGGTCACACACAAATCCACAGCCCTG  
347▶Gl uLeuLysGl nCysl l eGl yA rgLeuGl nGl uLeuThr P roSer Ser Gl yAspP roGl yGl uHi sAspP roAl aSer Thr Hi sLysSer Thr ArgP roV

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**HindIII (1765)**

1701 TGAAGAAGTCTCCAAAGAGGAAAAGAAATCCAAGAACTCCCTGTCCCTGCCTTACCCAGCAAGCTTCCACGTTTGGAGCCCCGGAACAGTTAGT  
380▶al LysLysVal l Ser LysGl uGl uLysLysSer LysLysP roP roVal l P roAl aLeuP roSer LysLeuP roThr PheGl yAl aP roGl uGl nLeuVa

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**MscI (1895)**  
**BalI (1895)**

1801 GGATTTAAACAAGCTGGCTTGGAGGCTGCAGCCAAAGCCACCAGCTCACATCCGAACCTCAACATCTCTCAAGGCCAAGGTGCTGGAGACCTTCTGGCC  
413▶l AspLeuLysGl nAl aGl yLeuGl uAl aAl aAl aLysAl aThr Ser Ser Hi sP roAsnSer Thr Ser LeuLysAl aLysVal l LeuGl uThr PheLeuAl a  
1901 AAGTCAGACCTGAGCTCCTGGAGTATTACATTAAGTCACTCCTGGACTACAACCCGCCACAACAAAGTGGCTCTGTACAGAGTGTATACAGTAGCTT  
447▶LysSer ArgP roGl uLeuLeuGl uTyrTyr l l eLysVal l l eLeuAspTyrAsnThr Al aHi sAsnLysVal l Al aLeuSer Gl uCysTyrThr Val l Al aS

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**BamHI (2090)**

2001 CTGTGGCTGAGATGCCTCAGAATACCGGCCGATCCCCAGAGTTTACATACTGCTCTCAGGTGCTGGGCCTGCACTGCTACAAGAAGGGGATCCACTA  
480▶er Val l Al aGl uMe tP roGl nAsnTyrArgP roHi sP roGl nArgPheThr TyrCysSer Gl nVal l LeuGl yLeuHi sCysTyrLysLysGl y l l eHi sTy

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**XmnI (2121)**
**Bsp120I (2169)**  
**EcoO109I (2168)**

2101 CTGGGAGGTGGAGCTGCAGAAGAACAACCTTCTGTGGGGTAGGCATCTGCTACGGAAGCATGAACCGGCAGGGCCAGAAAGCAGGCTCGGCCGCAACAGC  
513▶r TrpGl uVal l Gl uLeuGl nLysAsnAsnPheCysGl yVal l Gl y l l eCysTyrGl ySer Me tAsnArgGl nGl yP roGl uSer ArgLeuGl yA rgAsnSer

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**BglII (2231)**

2201 GCCTCCTGGTGCCTGGAGTGGTTCAACACCAAGATCTCTGCCTGGCACAATAACGTGGAGAAAACCTGCCCTCCACCAAGGCCACGGGGTGGCGGTGC  
547▶Al aSer TrpCysVal l Gl uTrpPheAsnThr Lys l l eSer Al aTrpHi sAsnAsnVal l Gl uLysThr LeuP roSer Thr LysAl aThr ArgVal l Gl yVal l L

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**Tth111I (2344)**

2301 TTCTCAACTGTGACCACGGCTTTGTCATCTTCTCGCTGTTGCCGACAAGTCCACCTGATGTATAAGTTGAGGTGGACTTTACTGAGGCTTTGTACCC  
580▶euLeuAsnCysAspHi sGl yPheVal l l ePhePheAl aVal l Al aAspLysVal l Hi sLeuMe tTyrLysPheArgVal l AspPheThr Gl uAl aLeuTyrP r

MscI (2491)  
BalI (2491)  
**NheI (2485)**

2401 GGCTTTCTGGGTATTTCTGCTGGTGCCACACTCTCCATCTGCTCCCCAAGTAGGCAGGCTGTAGGCACCTGGGCTGACTGCCTGCTAGCTGGCCAGAC  
613▶oAl aPheTrpVal PheSerAl aGlyAl aThr LeuSer l l eCysSer ProLys●●●

2501 ATGATAAGATACATTGATGAGTTTGGACAAACCACAAC TAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAA

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**HpaI (2623)** MfeI (2634)

2601 CCATTATAAGCTGCAATAAACAAGTTAAACAACAACAATTGCATTCATTTTATGTTTCAGGTTCCAGGGGAGGTGTGGGAGTTTTTTAAAGCAAGTAAAA

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**EcoRI (2719)**

2701 CCTCTACAAATGTGGTATGAATTCTAAAATACAGCATAGCAAACTTTAACCTCAAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGG

2801 CATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGTTTGACGCTCACCTCTTTTCATGGAGTTTAAAGATATAGTGATTTTTCCCAAGTTTGAAGT

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**SspI (2958)** SwaI (2972)

2901 AGCTCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCACATTCCTTTTTAGTAAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAATA

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EcoO109I (3033)

3001 AATGTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGGAACCTTTAATAGAAAT

3101 TGGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCTGGTGTACTTGAGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCCATTCTCTCAAT

3201 GAGCACAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTGCACATGCCACAGGGGCTGACCACCTGATGGATCTGTCCACCTCATCAGAGTAGGGG  
117▶LeuVal PheCysAspProAl aTyrAspSer l l eLeuGl uArgCysMetGl yCysP roSer Val ValA rgl l eSer ArgAspVal Gl uAspSer TyrProH

**StuI (3397)**  
**Eco147I (3397)**

3301 TGCCTGACAGCCACAATGGTGTCAAAGTCTTCTGCCGTTGCTCACAGCAGACCCAATGGCAATGGCTTCAGCACAGACAGTGACCCTGCCAATGTAGG  
83▶i sArgValAl aVal l l eThr AspPheAspLysGl nGl yAsnSer ValAl aSer Gl y l l eAl a l l eAl aGl uAl aCysVal Thr ValA rgl y l l eTyrAl

3401 CCTCAATGTGGACAGCAGAGATGATCTCCCAGTCTTGGTCTGATGGCCGCCGACATGGTGTCTTGTCTCATAGAGCATGGTGTCTTCTCAGT  
50▶aGl u l l eHi sVal Al aSer l l e l l eGl uGl yThr LysThr Arg l l eAl aAl aGl yVal Hi sHi sLysAsnAspGl uTyrLeuMetThr l l eLysGl uThr

**PagI (3547)**  
**BspHI (3547)**

XmnI (3539)

3501 GGCGACTCCACCAGCTCCAGATCCTGCTGAGAGATGTTGAAGTCTTCATGATGGCCCTCTATAGTGAGTCTATTATACTATGCCGATATACTATGC  
17▶Al aVal Gl uVal LeuGl uLeuAspGl nGl nSer l l eAsnPheThr LysMet

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**VspI (3605)**  
**AseI (3605)**

3601 CGATGATTAATTGTCAAACAGCGTGGATGGCGTCTCCAGC T TATCTGACGGTTCACTAAACGAGCTCTGCTTATATAGACCTCCCACCGTACACGCCT

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**SpeI (3760)**

3700 ACCGCCCATTTGCGTCAATGGGCGGAGTTGTTACGACATTTTGAAAGTCCCGTTGATTTACTAGTCAAACAAACTCCCATTGACGTCAATGGGGTG

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**SnaBI (3888)**  
**Eco105I (3888)**

3799 GAGACTTGAAATCCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATG

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**NdeI (3993)**

3899 TACTGCCAAGTAGAAAGTCCCATAAGGTCATGTACTGGGCATAATGCCAGGCGGGCCATTTACCCTCATTGACGTCAATAGGGGGCGTACTTGGCATAT

3999 GATACACTTGATGTACTGCCAAGTGGGAGTTTACCCTAAATACTCCACCCATTGACGTCAATGGAAAGTCCCTATTGGCGTTACTATGGGAACATACGT

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SdaI (4171) PacI (4179) **BspLU11I (4189)**

4099 CATTATTGACGTCAATGGGCGGGGTCGTTGGGCGGTACGCCAGGCGGGCCATTTACCCTAAGTTATGTAACGCCCTGCAGGTTAA TTAAGAACATGTG

4197 AGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGCCGCTTGTGGCGTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACA AAAATCGACGC

4297 TCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGCGTTTTCCCTGGAAGTCCCTCGTGCCTCTCTGTTCCGACCTGCGCTTA

4397 CCGGATACCTGTCCGCTTTCTCCCTTCGGAAGCGTGGCGTTTTCTCATAGCTCAGCTGTAGGTATCTCAGTTCGGTGTAGGTGTTCCGCTCAAGCT

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**ApaLI (4503)**

4497 GGGCTGTGTGCACGAACCCCGTTCAGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAAGACACGACTTATCGCCACTG

4597 GCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGCGGTGCTACAGAGTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAG

4697 TATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGTGGTAGCGGTGGTTTTTT

4797 TGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGAACGAAAACCTCACGT

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PacI (4919) SwaI (4928) **NotI (4938)**

4897 TAAGGGATTTTGGTCATGGCTAGTTAATTAACATTTAAATC AGCGGCCGCAATAAAATATCTTTATTTTATTACATCTGTGTGGTTTTTTGTGTGA

4997 ATCGTAACTAACATACGCTCTCCATCAAACAAAACGAAACAAAACAACTAGCAAAATAGGCTGTCCCAAGTGAAGTGCAGGTGCCAGAACATTTCTC  
5097 TATCGAA