

seqlist

SEQUENCE LISTING

<110> The Regents of the University of California

Yi Tang

Xue Gao

Xinkai Xie

<120> LovD MUTANTS EXHIBITING IMPROVED

PROPERTIES TOWARDS SIMVASTATIN SYNTHESIS

<130> G&C 30435.211WOU1

<140> US2010/052038

<141> 2010-10-08

<150> 61/249,894

<151> 2009-10-08

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<213> Aspergillus terreus

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 35           40           45
Cys Phe Gly Ala Arg Thr Val Arg Arg Asp Glu Cys Asn Gln Leu Pro
 50           55           60
Pro Leu Gln Val Asp Thr Pro Cys Arg Leu Ala Ser Ala Thr Lys Leu
 65           70           75
Leu Thr Thr Ile Met Ala Leu Gln Cys Met Glu Arg Gly Leu Val Asp
 85           90           95
Leu Asp Glu Thr Val Asp Arg Leu Leu Pro Asp Leu Ser Ala Met Pro
100          105          110
Val Leu Glu Gly Phe Asp Asp Ala Gly Asn Ala Arg Leu Arg Glu Arg
115          120          125
Arg Gly Lys Ile Thr Leu Arg His Leu Leu Thr His Thr Ser Gly Leu
130          135          140
Ser Tyr Val Phe Leu His Pro Leu Leu Arg Glu Tyr Met Ala Gln Gly
145          150          155
His Leu Gln Ser Ala Glu Lys Phe Gly Ile Gln Ser Arg Leu Ala Pro
165          170          175
Pro Ala Val Asn Asp Pro Gly Ala Glu Trp Ile Tyr Gly Ala Asn Leu
180          185          190
Asp Trp Ala Gly Lys Leu Val Glu Arg Ala Thr Gly Leu Asp Leu Glu
195          200          205
Gln Tyr Leu Gln Glu Asn Ile Cys Ala Pro Leu Gly Ile Thr Asp Met
210          215          220
Thr Phe Lys Leu Gln Gln Arg Pro Asp Met Leu Ala Arg Arg Ala Asp
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Val Tyr Phe Arg Ala Asp Gly Glu Glu Cys Phe Gly Gly Gln Gly Val

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Pro Ala Leu Glu Pro Arg Leu Glu Glu Gln Met Asn Gln His Met Asp
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Ala Ser Pro His Ile Asn Tyr Gly Gly Pro Met Pro Met Val Leu Arg
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Arg Ser Phe Gly Leu Gly Gly Ile Ile Ala Leu Glu Asp Leu Asp Gly
340
Glu Asn Trp Arg Arg Lys Gly Ser Leu Thr Phe Gly Gly Gly Pro Asn
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Ile Val Trp Gln Ile Asp Pro Lys Ala Gly Leu Cys Thr Leu Ala Phe
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35
Ile Asp Tyr Thr Arg Cys Phe Gly Ala Arg Thr Val Glu Arg Asp Glu
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Cys Gln Arg Leu Pro Pro Met Glu Ile Asp Thr Pro Leu Arg Leu Ala
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Ser Ala Thr Lys Leu Leu Thr Thr Ile Met Ala Leu Gln Cys Met Glu
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Gln Gly Leu Val Asp Leu Asp Glu Asn Val Asn Arg Leu Leu Pro Asp
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Leu Ser Asp Met Gln Val Leu Thr Gly Phe Asp Ala Ala Gly Asn Ala
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Ile Met Arg Asp Arg Glu Gly Ile Ile Lys Leu Arg His Leu Leu Thr
130
His Thr Ser Gly Leu Ser Tyr Ala Phe Leu His Pro Leu Leu Gln Glu
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Tyr Met Ala Lys Gly Tyr Leu Lys Thr Ala Glu Lys Phe Gly Ile Gln
165
Ser Arg Leu Ala Pro Pro Ala Ile Asn Asp Pro Gly Val Glu Trp Ile
180
Tyr Gly Ala Asn Leu Asp Trp Ala Gly Lys Leu Ile Glu Arg Ala Thr
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Gly Val Asp Leu Glu Glu Phe Met Gln Lys Asn Ile Cys Glu Pro Leu
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Gly Ile Thr Asp Met Thr Phe Lys Leu Gln Gln Arg Pro Asp Met Leu
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Ala Arg Arg Ser Asp Gln Thr Arg Arg Asn Glu Asn Gly Ser Leu Arg
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Tyr Asp Asp Ser Val Tyr Phe Arg His Asp Gly Glu Glu Cys Phe Gly
260
Gly Gln Gly Val Phe Cys Gly Pro Glu Ser Tyr Met Lys Val Leu Asn
275      280      285

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seqlist

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Pro	Val	Met	Arg	Arg	Asn	Phe	Gly	Leu	Gly	Gly	Ile	Ile	Ala	Met	Gly
				340				345					350		
Asp	Leu	Asp	Gly	His	Asn	Trp	Arg	Glu	Gly	Ser	Leu	Thr	Phe	Gly	
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Gly	Gly	Pro	Asn	Ile	Val	Trp	Gln	Ile	Asp	Pro	Thr	Val	Gly	Leu	Cys
	370					375					380				
Thr	Leu	Val	Val	Phe	Gln	Leu	Glu	Pro	Trp	Asn	Asp	Pro	Ile	Cys	Lys
385					390					395					400
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 <213> Aspergillus terreus

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Trp	Lys	Leu	Leu	Glu	Glu	Gly	Gly	Ser	Ala	Trp	Ser	Lys	Ile	Pro	Pro
		35					40					45			
Ser	Arg	Phe	Asn	Val	Gly	Gly	Val	Tyr	His	Pro	Asn	Gly	Gln	Arg	Val
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Gly	Ser	Met	His	Val	Arg	Gly	Gly	His	Phe	Leu	Asp	Glu	Asp	Pro	Ala
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Leu	Phe	Asp	Ala	Ser	Phe	Phe	Asn	Met	Ser	Thr	Glu	Val	Ala	Ser	Cys
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Met	Asp	Pro	Gln	Tyr	Arg	Leu	Ile	Leu	Glu	Val	Val	Tyr	Glu	Ala	Leu
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Glu	Ala	Ala	Gly	Ile	Pro	Leu	Glu	Gln	Val	Ser	Gly	Ser	Lys	Thr	Gly
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Gln	Pro	Glu	Ala	Leu	Pro	Arg	Tyr	Phe	Ile	Thr	Gly	Asn	Ala	Gly	Thr
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Met	Leu	Ala	Asn	Arg	Val	Ser	His	Phe	Tyr	Asp	Leu	Arg	Gly	Pro	Ser
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Val	Ser	Ile	Asp	Thr	Ala	Cys	Ser	Thr	Thr	Leu	Thr	Ala	Leu	His	Leu
		180						185					190		
Ala	Ile	Gln	Ser	Leu	Arg	Ala	Gly	Glu	Ser	Asp	Met	Ala	Ile	Val	Ala
		195					200					205			
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Ala	Asp	Gly	Tyr	Gly	Arg	Gly	Glu	Gly	Val	Ala	Ala	Ile	Val	Leu	Lys
				245					250					255	
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seqlist

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			820					825					830		
Val	Ile	Glu	Ile	Gly	Pro	His	Gly	Ala	Leu	Gly	Gly	Pro	Ile	Lys	Gln
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Ile	Met	Gln	Leu	Pro	Glu	Leu	Ala	Thr	Cys	Asp	Ile	Pro	Tyr	Leu	Ser
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Cys	Leu	Ser	Arg	Gly	Lys	Ser	Ser	Leu	Ser	Thr	Leu	Arg	Leu	Leu	Ala
865					870					875					880
Ser	Glu	Leu	Ile	Arg	Ala	Gly	Phe	Pro	Val	Asp	Leu	Asn	Ala	Ile	Asn
				885					890					895	
Phe	Pro	Arg	Gly	Cys	Glu	Ala	Ala	Arg	Val	Gln	Val	Leu	Ser	Asp	Leu
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Pro	Pro	Tyr	Pro	Trp	Asn	His	Glu	Thr	Arg	Tyr	Trp	Lys	Glu	Pro	Arg
		915					920					925			
Ile	Ser	Gln	Ser	Ala	Arg	Gln	Arg	Lys	Gly	Pro	Val	His	Asp	Leu	Ile
	930					935					940				
Gly	Leu	Gln	Glu	Pro	Leu	Asn	Leu	Pro	Leu	Ala	Arg	Ser	Trp	His	Asn
945					950					955					960
Val	Leu	Arg	Val	Ser	Asp	Leu	Pro	Trp	Leu	Arg	Asp	His	Val	Val	Gly
				965					970					975	
Ser	His	Ile	Val	Phe	Pro	Gly	Ala	Gly	Phe	Val	Cys	Met	Ala	Val	Met
			980					985					990		
Gly	Ile	Ser	Thr	Leu	Cys	Ser	Ser	Asp	His	Glu	Ser	Asp	Asp	Ile	Ser
	995						1000					1005			
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Gln	Ser	Leu	Gly	Ser	Gln	Asp	Trp	Gln	Arg	Phe	Leu	Val	His	Ser	Ile
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Thr	Ala	Asp	Lys	Asn	Asp	Trp	Thr	Glu	His	Cys	Thr	Gly	Leu	Val	Arg
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1265					1270					1275					1280
Glu	Lys	Thr	Leu	Gly	Thr	Gly	Ile	Gln	Glu	His	Glu	Ile	Ser	Leu	Ile
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Leu	Glu	Leu	Arg	Arg	Cys	Ser	Val	His	Phe	Ile	Gln	Glu	Ala	Met	Glu

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 1345 1350 1355 1360
 Cys Ser Leu Arg Ser Arg Val Val Ala Gly Ser Thr Asn Gly Glu Met
 1365 1370 1375
 Ile Cys Arg Leu Gly Ser Val Leu Pro Ala Ile Leu Arg Arg Glu Val
 1380 1385 1390
 Asp Pro Leu Glu Val Met Met Asp Gly His Leu Leu Ser Arg Tyr Tyr
 1395 1400 1405
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 Val Arg Leu Cys Cys His Lys Asn Pro Arg Ala Arg Ile Leu Glu Ile
 1425 1430 1435 1440
 Gly Gly Gly Thr Gly Gly Cys Thr Gln Leu Val Val Asp Ser Leu Gly
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 1460 1465 1470
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 1475 1480 1485
 Asp Phe Arg Lys Leu Asp Ile Glu Asp Asp Pro Glu Ala Gln Gly Phe
 1490 1495 1500
 Val Cys Gly Ser Tyr Asp Val Val Leu Ala Cys Gln Val Leu His Ala
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 Thr Ser Asn Met Gln Arg Thr Leu Thr Asn Val Arg Lys Leu Leu Lys
 1525 1530 1535
 Pro Gly Gly Lys Leu Ile Leu Val Glu Thr Thr Arg Asp Glu Leu Asp
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 Leu Phe Phe Thr Phe Gly Leu Leu Pro Gly Trp Trp Leu Ser Glu Glu
 1555 1560 1565
 Pro Glu Arg Gln Ser Thr Pro Ser Leu Ser Pro Thr Met Trp Arg Ser
 1570 1575 1580
 Met Leu His Thr Thr Gly Phe Asn Gly Val Glu Val Glu Ala Arg Asp
 1585 1590 1595 1600
 Cys Asp Ser His Glu Phe Tyr Met Ile Ser Thr Met Met Ser Thr Ala
 1605 1610 1615
 Val Gln Ala Thr Pro Met Ser Cys Ser Val Lys Leu Pro Glu Val Leu
 1620 1625 1630
 Leu Val Tyr Val Asp Ser Ser Thr Pro Met Ser Trp Ile Ser Asp Leu
 1635 1640 1645
 Gln Gly Glu Ile Arg Gly Arg Asn Cys Ser Val Thr Ser Leu Gln Ala
 1650 1655 1660
 Leu Arg Gln Val Pro Pro Thr Glu Gly Gln Ile Cys Val Phe Leu Gly
 1665 1670 1675 1680
 Glu Val Glu His Ser Met Leu Gly Ser Val Thr Asn Asp Asp Phe Thr
 1685 1690 1695
 Leu Leu Thr Ser Met Leu Gln Leu Ala Gly Gly Thr Leu Trp Val Thr
 1700 1705 1710
 Gln Gly Ala Thr Met Lys Ser Asp Pro Leu Lys Ala Leu His Leu
 1715 1720 1725
 Gly Leu Arg Thr Met Arg Asn Glu Ser His Gly Lys Arg Phe Val
 1730 1735 1740
 Ser Leu Asp Leu Asp Pro Ser Arg Asn Pro Trp Thr Gly Asp Ser Arg
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 Asp Ala Ile Val Ser Val Leu Asp Leu Ile Ser Met Ser Asp Glu Lys
 1765 1770 1775
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 Phe Ser Asp Ser Ile Asn Gly Gly Glu Glu Asp Gly Tyr Ala Leu Glu
 1795 1800 1805

seqlist

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1810 1815 1820
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1845 1850 1855
Phe Gly Leu Asn Phe Arg Asp Ile Met Val Ala Met Gly Gln Leu Glu
1860 1865 1870
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1875 1880 1885
Glu Thr Ala Arg Thr Ile Ala Pro Gly Leu Ala Val Gly Asp Arg Val
1890 1895 1900
Cys Ala Leu Met Asn Gly His Trp Ala Ser Arg Val Thr Thr Ser Arg
1905 1910 1915 1920
Thr Asn Val Val Arg Ile Pro Glu Thr Leu Ser Phe Pro His Ala Ala
1925 1930 1935
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1940 1945 1950
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1955 1960 1965
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1970 1975 1980
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1985 1990 1995 2000
Lys Phe His Leu Asp Pro Asp His Val Phe Ser Ser Arg Asp Ser Ser
2005 2010 2015
Phe Val Asp Gly Ile Lys Thr Arg Thr Arg Gly Lys Gly Val Asp Val
2020 2025 2030
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2035 2040 2045
Leu Ala Arg Phe Gly Arg Phe Val Glu Ile Gly Lys Lys Asp Leu Glu
2050 2055 2060
Gln Asn Ser Arg Leu Asp Met Ser Thr Phe Val Arg Asn Val Ser Phe
2065 2070 2075 2080
Ser Ser Val Asp Ile Leu Tyr Trp Gln Gln Ala Lys Pro Ala Glu Ile
2085 2090 2095
Phe Gln Ala Met Ser Glu Val Ile Leu Leu Trp Glu Arg Thr Ala Ile
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Gly Leu Ile His Pro Ile Ser Glu Tyr Pro Met Ser Ala Leu Glu Lys
2115 2120 2125
Ala Phe Arg Thr Met Gln Ser Gly Gln His Val Gly Lys Ile Val Val
2130 2135 2140
Thr Val Ala Pro Asp Asp Ala Val Leu Val Arg Gln Glu Arg Met Pro
2145 2150 2155 2160
Leu Phe Leu Lys Pro Asn Val Ser Tyr Leu Val Ala Gly Gly Leu Gly
2165 2170 2175
Gly Ile Gly Arg Arg Ile Cys Glu Trp Leu Val Asp Arg Gly Ala Arg
2180 2185 2190
Tyr Leu Ile Ile Leu Ser Arg Thr Ala Arg Val Asp Pro Val Val Thr
2195 2200 2205
Ser Leu Gln Glu Arg Gly Cys Thr Val Ser Val Gln Ala Cys Asp Val
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Ala Asp Glu Ser Gln Leu Glu Ala Ala Leu Gln Gln Cys Arg Ala Glu
2225 2230 2235 2240
Glu Met Pro Pro Ile Arg Gly Val Ile Gln Gly Ala Met Val Leu Lys
2245 2250 2255
Asp Ala Leu Val Ser Gln Met Thr Ala Asp Gly Phe His Ala Ala Leu
2260 2265 2270
Arg Pro Lys Val Gln Gly Ser Trp Asn Leu His Arg Ile Ala Ser Asp
2275 2280 2285
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seqlist

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Gly	Pro	His	Trp	Ala	His	Ala	Asp	Trp	Met	Gln	Glu	Ala	Arg	Phe
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Gly	Ile	Lys	Tyr	Arg	Asp	Pro	Leu	Arg	Asp	Asn	His	Gly	Ala	Leu
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Arg	Asn	Trp	Ile	Thr	Ala	Lys	Phe	Asn	Val	Asp	Ile	Ser	Val	Phe
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Leu	Met	Glu	Gly	Arg	Thr	Ile	Ala	Lys	Val	Ala	Glu	Val	Val	Leu
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	2530													

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<400> 4

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Asp	Glu	Glu	Leu	Ser	Ser	His	Phe	Thr	Leu	His	Leu	Val	Asp	Leu	Pro
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Gly	Phe	Gly	Arg	Ser	Arg	Gly	Phe	Gly	Ala	Leu	Ser	Leu	Ala	Asp	Met
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Ala	Glu	Ala	Val	Leu	Gln	Gln	Ala	Pro	Asp	Lys	Ala	Ile	Trp	Leu	Gly
65					70					75				80	
Trp	Ser	Leu	Gly	Gly	Leu	Val	Ala	Ser	Gln	Ile	Ala	Leu	Thr	His	Pro
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Glu	Arg	Val	Gln	Ala	Leu	Val	Thr	Val	Ala	Ser	Ser	Pro	Cys	Phe	Ser
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Ala	Arg	Asp	Glu	Trp	Pro	Gly	Ile	Lys	Pro	Asp	Val	Leu	Ala	Gly	Phe
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Gln	Gln	Gln	Leu	Ser	Asp	Asp	Phe	Gln	Arg	Thr	Val	Glu	Arg	Phe	Leu
		130				135					140				
Ala	Leu	Gln	Thr	Met	Gly	Thr	Glu	Thr	Ala	Arg	Gln	Asp	Ala	Arg	Ala
145					150				155					160	
Leu	Lys	Lys	Thr	Val	Leu	Ala	Leu	Pro	Met	Pro	Glu	Val	Asp	Val	Leu
				165					170					175	
Asn	Gly	Gly	Leu	Glu	Ile	Leu	Lys	Thr	Val	Asp	Leu	Arg	Gln	Pro	Leu
			180					185					190		
Gln	Asn	Val	Ser	Met	Pro	Phe	Leu	Arg	Leu	Tyr	Gly	Tyr	Leu	Asp	Gly
		195					200					205			

seqlist

Leu Val Pro Arg Lys Val Val Pro Met Leu Asp Lys Leu Trp Pro His
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 Ser Glu Ser Tyr Ile Phe Ala Lys Ala Ala His Ala Pro Phe Ile Ser
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 Cys Ala Gly Gly Cys Ala Gly Ala Thr Cys Cys Cys Cys Gly Gly Gly
 85 90 95
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seqlist

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