

# 444071SEQLIST

## SEQUENCE LISTING

<110> Lee, Jeffrey D.  
 Mujica, Alexander O.  
 Auerbach, Wojtek  
 Lai, Venus Ka-Man  
 Valenzuela, David M.  
 Vancopoulos, George D.

<120> Targeted Modification of Rat Genome

<130> 57766-444071

<160> 23

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> a genomic target sequence that is linked to a  
 guide RNA (gRNA)

<220>

<221> misc\_feature

<222> 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18,  
 19, 20, 21

<223> n = A,T,C or G

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23

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<400> 2

guuuuagagc uagaaaauagc aaguuaaaau aaggcuaguc cguuaucaac uugaaaaagu 60  
 ggacccgagu cggugcuuuu 80

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<210> 3  
 <211> 42  
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<400> 3  
 guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc cg 42

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<213> Artificial Sequence

<220>

<223> a tracrRNA

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aagguaguc cg

12

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<211> 50

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50

<210> 9

<211> 203

<212> PRT

<213> Mus Musculus

<400> 9

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| Met | Lys | Val | Leu | Ala | Ala | Gly | Ile | Val | Pro | Leu | Leu | Leu | Leu | Val | Leu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |
| His | Trp | Lys | His | Gly | Ala | Gly | Ser | Pro | Leu | Pro | Ile | Thr | Pro | Val | Asn |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Thr | Cys | Ala | Ile | Arg | His | Pro | Cys | His | Gly | Asn | Leu | Met | Asn | Gln |
|     |     | 35  |     |     |     |     | 40  |     |     |     | 45  |     |     |     |     |
| Ile | Lys | Asn | Gln | Leu | Ala | Gln | Leu | Asn | Gly | Ser | Ala | Asn | Ala | Leu | Phe |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ile | Ser | Tyr | Tyr | Thr | Ala | Gln | Gly | Glu | Pro | Phe | Pro | Asn | Asn | Val | Glu |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Lys | Leu | Cys | Ala | Pro | Asn | Met | Thr | Asp | Phe | Pro | Ser | Phe | His | Gly | Asn |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gly | Thr | Glu | Lys | Thr | Lys | Leu | Val | Glu | Leu | Tyr | Arg | Met | Val | Ala | Tyr |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Ser | Ala | Ser | Leu | Thr | Asn | Ile | Thr | Arg | Asp | Gln | Lys | Val | Leu | Asn |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Pro | Thr | Ala | Val | Ser | Leu | Gln | Val | Lys | Leu | Asn | Ala | Thr | Ile | Asp | Val |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Met | Arg | Gly | Leu | Leu | Ser | Asn | Val | Leu | Cys | Arg | Leu | Cys | Asn | Lys | Tyr |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Arg | Val | Gly | His | Val | Asp | Val | Pro | Pro | Val | Pro | Asp | His | Ser | Asp | Lys |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Glu | Ala | Phe | Gln | Arg | Lys | Lys | Leu | Gly | Cys | Gln | Leu | Leu | Gly | Thr | Tyr |

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|     |     |     |     |     |
|-----|-----|-----|-----|-----|
|     | 180 |     | 185 | 190 |
| Lys | Gln | Val | Ile | Ser |
|     |     | Val | Val | Val |
|     |     |     | Gln | Ala |
|     |     |     | Phe |     |
|     | 195 |     | 200 |     |

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 caggccctga accgc 15

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 <223> ZFN1 cutting site

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 ttctgg 6

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 gattacctgc gctggg 16

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 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

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 <223> conserved domain of a family of homing nucleases

<400> 16  
 Leu Ala Gly Leu Ile Asp Ala Asp Gly  
 1 5

<210> 17  
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<400> 17  
 caggccctga accgc 15

<210> 18

# 444071SEQLIST

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6

<210> 19  
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<220>  
<223> ZFN1b binding site

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gattacctgc gctggg

16

<210> 20  
<211> 369  
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1 5 10 15  
Pro Leu Leu Gly Val Gly Leu Asn Thr Thr Ile Leu Thr Pro Asn Gly  
20 25 30  
Asn Glu Asp Thr Thr Ala Asp Phe Phe Leu Thr Thr Met Pro Thr Asp  
35 40 45  
Ser Leu Ser Val Ser Thr Leu Pro Leu Pro Glu Val Gln Cys Phe Val  
50 55 60  
Phe Asn Val Glu Tyr Met Asn Cys Thr Trp Asn Ser Ser Ser Glu Pro  
65 70 75 80  
Gln Pro Thr Asn Leu Thr Leu His Tyr Trp Tyr Lys Asn Ser Asp Asn  
85 90 95  
Asp Lys Val Gln Lys Cys Ser His Tyr Leu Phe Ser Glu Glu Ile Thr  
100 105 110  
Ser Gly Cys Gln Leu Gln Lys Lys Glu Ile His Leu Tyr Gln Thr Phe  
115 120 125  
Val Val Gln Leu Gln Asp Pro Arg Glu Pro Arg Arg Gln Ala Thr Gln  
130 135 140  
Met Leu Lys Leu Gln Asn Leu Val Ile Pro Trp Ala Pro Glu Asn Leu  
145 150 155 160  
Thr Leu His Lys Leu Ser Glu Ser Gln Leu Glu Leu Asn Trp Asn Asn

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |  |
| Arg | Phe | Leu | Asn | His | Cys | Leu | Glu | His | Leu | Val | Gln | Tyr | Arg | Thr | Asp |  |  |
|     |     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |  |  |
| Trp | Asp | His | Ser | Trp | Thr | Glu | Gln | Ser | Val | Asp | Tyr | Arg | His | Lys | Phe |  |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |  |  |
| Ser | Leu | Pro | Ser | Val | Asp | Gly | Gln | Lys | Arg | Tyr | Thr | Phe | Arg | Val | Arg |  |  |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |  |
| Ser | Arg | Phe | Asn | Pro | Leu | Cys | Gly | Ser | Ala | Gln | His | Trp | Ser | Glu | Trp |  |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |
| Ser | His | Pro | Ile | His | Trp | Gly | Ser | Asn | Thr | Ser | Lys | Glu | Asn | Pro | Phe |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |
| Leu | Phe | Ala | Leu | Glu | Ala | Val | Val | Ile | Ser | Val | Gly | Ser | Met | Gly | Leu |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |  |
| Ile | Ile | Ser | Leu | Leu | Cys | Val | Tyr | Phe | Trp | Leu | Glu | Arg | Thr | Met | Pro |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     |     | 285 |     |     |  |  |
| Arg | Ile | Pro | Thr | Leu | Lys | Asn | Leu | Glu | Asp | Leu | Val | Thr | Glu | Tyr | His |  |  |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |
| Gly | Asn | Phe | Ser | Ala | Trp | Ser | Gly | Val | Ser | Lys | Gly | Leu | Ala | Glu | Ser |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |  |
| Leu | Gln | Pro | Asp | Tyr | Ser | Glu | Arg | Leu | Cys | Leu | Val | Ser | Glu | Ile | Pro |  |  |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     |     | 335 |     |  |  |
| Pro | Lys | Gly | Gly | Ala | Leu | Gly | Glu | Gly | Pro | Gly | Ala | Ser | Pro | Cys | Asn |  |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |  |
| Gln | His | Ser | Pro | Tyr | Trp | Ala | Pro | Pro | Cys | Tyr | Thr | Leu | Lys | Pro | Glu |  |  |
|     |     | 355 |     |     |     | 360 |     |     |     |     |     | 365 |     |     |     |  |  |

Thr

&lt;210&gt; 21

&lt;211&gt; 368

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 21

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Leu | Lys | Pro | Leu | Leu | Pro | Ser | Arg | Ser | Phe | Leu | Leu | Leu | Gln | Leu |  |  |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |  |
| Leu | Leu | Leu | Arg | Val | Gly | Trp | Ser | Ser | Lys | Val | Leu | Met | Ser | Ser | Gly |  |  |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |  |
| Asn | Glu | Asp | Thr | Lys | Ser | Asp | Leu | Leu | Leu | Thr | Ser | Met | Asp | Leu | Lys |  |  |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |  |  |
| His | Leu | Ser | Val | Pro | Thr | Leu | Pro | Leu | Pro | Glu | Val | Gln | Cys | Phe | Val |  |  |
|     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |  |  |
| Phe | Asn | Val | Glu | Tyr | Met | Asn | Cys | Thr | Trp | Asn | Ser | Ser | Ser | Glu | Pro |  |  |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |  |  |
| Gln | Pro | Thr | Asn | Leu | Thr | Met | His | Tyr | Arg | Tyr | Lys | Gly | Ser | Asp | Asn |  |  |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |  |  |
| Asn | Thr | Phe | Gln | Glu | Cys | Ser | His | Tyr | Leu | Phe | Ser | Lys | Glu | Ile | Thr |  |  |

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      100      105      110
Ser Gly Cys Gln Ile Gln Lys Glu Asp Ile Gln Leu Tyr Gln Thr Phe
      115      120      125
Val Val Gln Leu Gln Asp Pro Gln Lys Pro Gln Arg Arg Ala Glu Gln
      130      135      140
Lys Leu Asn Leu Gln Asn Leu Val Ile Pro Trp Ala Pro Glu Asn Leu
145      150      155      160
Thr Leu Tyr Asn Leu Ser Glu Ser Gln Val Glu Leu Arg Trp Lys Ser
      165      170      175
Arg Tyr Ile Glu Arg Cys Leu Gln Tyr Leu Val Gln Tyr Arg Ser Asn
      180      185      190
Arg Asp Arg Ser Trp Thr Glu Gln Ile Val Asp His Glu Pro Arg Phe
      195      200      205
Ser Leu Pro Ser Val Asp Glu Gln Lys Leu Tyr Thr Phe Arg Val Arg
      210      215      220
Ser Arg Phe Asn Pro Ile Cys Gly Ser Thr Gln Gln Trp Ser Lys Trp
225      230      235      240
Ser Gln Pro Ile His Trp Gly Ser His Thr Ala Glu Glu Asn Pro Ser
      245      250      255
Leu Phe Ala Leu Glu Ala Val Leu Ile Pro Val Gly Thr Met Gly Leu
      260      265      270
Ile Ile Thr Leu Ile Phe Val Tyr Cys Trp Leu Glu Arg Met Pro Arg
      275      280      285
Ile Pro Ala Ile Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly
      290      295      300
Asn Phe Ser Ala Trp Ser Gly Val Ser Lys Gly Leu Thr Glu Ser Leu
305      310      315      320
Gln Pro Asp Tyr Ser Glu Arg Phe Cys His Val Ser Glu Ile Pro Pro
      325      330      335
Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly Gly Ser Pro Cys Ser Leu
      340      345      350
His Ser Pro Tyr Trp Pro Pro Pro Cys Tyr Ser Leu Lys Pro Glu Ala
      355      360      365

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<210> 22

<211> 368

<212> PRT

<213> Artificial Sequence

<220>

<223> chimeric IL-2 receptor gamma comprising the rat  
IL-2 receptor gamma protein having the ecto domain  
of IL-2 gamma receptor from human

<400> 22

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Met Leu Lys Pro Ser Leu Pro Phe Thr Ser Leu Leu Phe Leu Gln Leu
  1              5              10              15

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Pro Leu Leu Gly Val Gly Leu Asn Thr Thr Ile Leu Thr Pro Asn Gly
    20          25          30
Asn Glu Asp Thr Thr Ala Asp Phe Phe Leu Thr Thr Met Pro Thr Asp
    35          40          45
Ser Leu Ser Val Ser Thr Leu Pro Leu Pro Glu Val Gln Cys Phe Val
    50          55          60
Phe Asn Val Glu Tyr Met Asn Cys Thr Trp Asn Ser Ser Ser Glu Pro
    65          70          75          80
Gln Pro Thr Asn Leu Thr Leu His Tyr Trp Tyr Lys Asn Ser Asp Asn
    85          90          95
Asp Lys Val Gln Lys Cys Ser His Tyr Leu Phe Ser Glu Glu Ile Thr
    100         105         110
Ser Gly Cys Gln Leu Gln Lys Lys Glu Ile His Leu Tyr Gln Thr Phe
    115         120         125
Val Val Gln Leu Gln Asp Pro Arg Glu Pro Arg Arg Gln Ala Thr Gln
    130         135         140
Met Leu Lys Leu Gln Asn Leu Val Ile Pro Trp Ala Pro Glu Asn Leu
    145         150         155         160
Thr Leu His Lys Leu Ser Glu Ser Gln Leu Glu Leu Asn Trp Asn Asn
    165         170         175
Arg Phe Leu Asn His Cys Leu Glu His Leu Val Gln Tyr Arg Thr Asp
    180         185         190
Trp Asp His Ser Trp Thr Glu Gln Ser Val Asp Tyr Arg His Lys Phe
    195         200         205
Ser Leu Pro Ser Val Asp Gly Gln Lys Arg Tyr Thr Phe Arg Val Arg
    210         215         220
Ser Arg Phe Asn Pro Leu Cys Gly Ser Ala Gln His Trp Ser Glu Trp
    225         230         235         240
Ser His Pro Ile His Trp Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe
    245         250         255
Leu Phe Ala Leu Glu Ala Val Leu Ile Pro Val Gly Thr Met Gly Leu
    260         265         270
Ile Ile Thr Leu Ile Phe Val Tyr Cys Trp Leu Glu Arg Met Pro Arg
    275         280         285
Ile Pro Ala Ile Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His Gly
    290         295         300
Asn Phe Ser Ala Trp Ser Gly Val Ser Lys Gly Leu Thr Glu Ser Leu
    305         310         315         320
Gln Pro Asp Tyr Ser Glu Arg Phe Cys His Val Ser Glu Ile Pro Pro
    325         330         335
Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly Gly Ser Pro Cys Ser Leu
    340         345         350
His Ser Pro Tyr Trp Pro Pro Pro Cys Tyr Ser Leu Lys Pro Glu Ala
    355         360         365

```

&lt;210&gt; 23

&lt;211&gt; 23

# 444071SEQLIST

<212> DNA

<213> Artificial Sequence

<220>

<223> a genomic target sequence that is linked to a  
guide RNA (gRNA)

<220>

<221> misc\_feature

<222> (2)...(21)

<223> n= A, T, C or G

<220>

<221> misc\_feature

<222> (2)...(21)

<223> n can be from 1-20 nucleotides

<400> 23

gnnnnnnnnnn nnnnnnnnnnn ngg

23