Expression of *Dux* family genes in early preimplantation embryos

Kenta Sugie[1], Satoshi Funaya[1], Machika Kawamura[1], Toshinobu Nakamura[2],

Masataka G. Suzuki[1], and Fugaku Aoki[1]*

[1]*Department of Integrated Biosciences, Graduate School of Frontier Sciences, The University of Tokyo, Kashiwa, 277-8562 Japan.*

[2]*Department of Bio-Science, Nagahama Institute of Bio-Science and Technology, Shiga 526-0829, Japan.*

*Address correspondence to: Fugaku Aoki, Department of Integrated Biosciences, Graduate School of Frontier Sciences, The University of Tokyo, Seimei-Building 302,

5-1-5 Kashiwanoha, Kashiwa 277-8652, Japan, E-mail: aokif@edu.k.u-tokyo.ac.jp

Author contributions:

FA conceived and supervised the study; KS and FA designed the experiments; KS performed the experiments; KS, SF, MK, MGS, and FA analyzed the data; and KS and FA wrote the manuscript.

Supplemental Table. S1. Primers and PCR conditions used for RT-PCR

Target gene		Primer	Annealing temperature	Cycle
Dux family	Forward	5'-GCCCTGCTATCAACTTTCAAGAAG-3'	57 ℃	36
	Reverse	5'-AGGCTTGCCCTAGGATCCTGAG-3'		
Zfp352	Forward	5'-AAAGCCTTGATCCTCAGGTG-3'	57 ℃	36
	Reverse	5'-GCCGAAGAGTTTTTCTGAGG-3'		
Zscan4d	Forward	5'-AAGAGGTGAGGTGGAGGAGT-3'	57 ℃	37
	Reverse	5'-AAGGTCTTTTGCTGGTGCCT-3'		
Wsb1	Forward	5'-CTCCAAGGCAAGTCCCTAGC-3'	57 ℃	36
	Reverse	5'-TGTAAAGGGCGCTCTGTCTG-3'		
Galk1	Forward	5'-GGCAGGGAGCTAATGAGCAA-3'	57 ℃	36
	Reverse	5'-GGGCAGCTGACCTCATAGTC-3'		
rabbit α-globin	Forward	5'-GTGGGACAGGAGCTTGAAAT-3'	58 ℃	26
	Reverse	5'-GCAGCCACGGTGGCGAGTAT-3'		

Supplemental Table. S2. Primers used for DNA sequencing

Target		Primers
	Forwarad	
	M13F (vector origin)	5'-GTAAAACGACGGCCAG-3'
		5'-TCCAGGCCACAGGGTAGAG-3'
Dux full length CDS (2025 bps)	*Dux* origin	5'-TGGAGACCCTGGTGGCA-3'
		5'-TCCCAAGTGGCACAGCG-3'
	Reverse	
	M13R (vector origin)	5'-CAGGAAACAGCTATGAC-3'
		5'-CTCTACCCTGTGGCCTGGA-3'
	Dux origin	5'-TGCCACCAGGGTCTCCA-3'
		5'-GGGAAGGCTTGGACTCTCTGA-3'
	Forwarad	
Part of *Dux* CDS (31-889 bps)	M13F (vector origin)	5'-GTAAAACGACGGCCAG-3'
	Reverse	
	M13R (vector origin)	5'-CAGGAAACAGCTATGAC-3'

Supplemental Fig. S1

```
Dux      ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG1    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG2    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG3    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG4    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCAC  60
DuxG5    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG6    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG7    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG8    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG9    ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG10   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG11   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG12   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG13   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG14   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG15   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCAC  60
DuxG16   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG17   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG18   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG19   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG20   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG21   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG22   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
DuxG23   ATGGCAGAAGCTGGCAGCCCTGTTGGTGGCAGTGGTGTGGCACGGGAATCCCGGCGGCGC  60
                                                                    *

Dux      AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG1    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG2    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG3    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG4    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG5    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG6    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG7    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG8    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG9    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG10   AGGAAGACGGTTTGGCAGGCCGGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG11   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG12   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG13   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG14   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG15   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG16   AGGAAGACGGTTTGGCAGGCCGGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG17   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG18   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG19   AGGAAGACAGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG20   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG21   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG22   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
DuxG23   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG  120
                 *                   *

Dux      AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG1    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG2    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG3    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG4    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG5    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG6    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG7    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCAAATGGGGGTCTCAGATTGC  180
DuxG8    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG9    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCAAATGGGGGTCTCAGATTGC  180
DuxG10   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG11   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG12   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG13   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG14   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG15   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG16   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG17   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCAAATGGGGGTCTCAGATTGC  180
DuxG18   AGATACCTGAGCTTCAAGGAGAGGAAGGGGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG19   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG20   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG21   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG22   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
DuxG23   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGTCTCAGATTGC  180
                              *                   *
```

```
Dux      CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG1    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG2    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG3    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG4    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG5    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG6    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG7    CGCATCCACGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG8    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG9    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG10   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG11   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG12   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG13   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG14   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG15   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG16   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG17   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG18   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG19   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG20   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG21   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG22   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxG23   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
                *

Dux      AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG1    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG2    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG3    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG4    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG5    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG6    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG7    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG8    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG9    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG10   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG11   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG12   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG13   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG14   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG15   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG16   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG17   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG18   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG19   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG20   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG21   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG22   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxG23   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300


Dux      TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG1    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG2    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG3    TCCAGGCCACAGGGTAGAGGCATGCGCTCACCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG4    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG5    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG6    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG7    TCCAGGCCACAGGGTAGAGGTATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG8    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG9    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG10   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG11   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG12   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG13   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG14   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG15   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG16   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG17   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG18   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG19   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG20   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG21   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG22   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxG23   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
                       *              *
```

```
Dux     TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG1   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG2   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG3   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG4   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG5   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG6   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG7   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG8   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG9   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAATCCACGACCAGGCTTTGCT 420
DuxG10  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG11  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG12  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG13  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG14  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG15  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG16  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG17  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAATCCACGACCAGGCTTTGCT 420
DuxG18  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG19  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG20  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG21  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG22  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxG23  TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
                                                 *

Dux     ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG1   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG2   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG3   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG4   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG5   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG6   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG7   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG8   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG9   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG10  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG11  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG12  ACCAGGGAGGAGCTGGCGCGTGACACAGGGATGCCCGAGGACACGATCCACATATGGTTT 480
DuxG13  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG14  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG15  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG16  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG17  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG18  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG19  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG20  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG21  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG22  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxG23  ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
                                      *

Dux     CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG1   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG2   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG3   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG4   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG5   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG6   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG7   CAAAACCAAAGAGCTCGGCGGCCCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG8   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG9   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG10  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG11  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG12  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG13  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG14  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG15  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG16  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG17  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG18  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG19  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG20  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG21  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG22  CAAAACCGAAGAGCTCGGCGGCGCCACAGAAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxG23  CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
               *                 *         *
```

```
Dux      T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG1    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG2    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG3    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG4    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG5    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG6    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG7    T T G C T G G C G T C A C A A G G G T G G G A C G G G G C C C A T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG8    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG9    T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG10   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG11   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG12   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG13   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG14   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG15   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG16   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG17   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG18   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG19   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG20   T T G C T G G T G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG21   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG22   T T G C T G G C A T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
DuxG23   T T G C T G G C G T C A C A A G G G T C G G A T G G G G C C C C T G C A G G T C C G G A A G G C A G A G A G C G T G A A  600
              * *              *          *              *

Dux      G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG1    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG2    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G A A A G T A C G G G C A T G G A T A C C T C G  660
DuxG3    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG4    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG5    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG6    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG7    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG8    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG9    G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG10   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C C G G C A T G G A T A C C T C G  660
DuxG11   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG12   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG13   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG14   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG15   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG16   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C C G G C A T G G A T A C C T C G  660
DuxG17   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG18   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG19   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG20   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
DuxG21   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G A A A G T A C G G G C A T G G A T A C C T C G  660
DuxG22   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G G A T G G A T A C C T C G  660
DuxG23   G G T G C C C A G G A G A A C T T G T T G C C A C A G G A A G A A G C A G G A A G T A C G G G C A T G G A T A C C T C G  660
                                                                 *         *   *

Dux      A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG1    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG2    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG3    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG4    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG5    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG6    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG7    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG8    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG9    A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG10   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG11   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG12   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG13   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG14   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG15   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG16   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG17   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG18   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG19   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG20   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG21   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG22   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
DuxG23   A G C C C T A G C G A C T T G C C C T C C T T C T G C G G A G A G T C C C A G C C T T T C C A A G T G G C A C A G C C C  720
```

```
Dux     CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG1   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG2   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG3   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG4   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG5   CGTGGAGCAGGCCAAAAAGAGGACCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG6   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG7   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG8   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG9   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG10  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG11  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG12  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG13  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG14  CGTGGAGCAGGCCAAAAAGAGGACCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG15  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG16  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG17  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG18  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG19  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG20  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG21  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG22  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxG23  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
                      *          *           *

Dux     CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG1   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG2   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG3   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG4   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG5   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG6   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG7   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG8   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG9   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG10  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG11  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG12  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG13  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG14  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG15  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG16  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG17  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG18  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG19  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG20  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG21  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG22  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxG23  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840

Dux     TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG1   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG2   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG3   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTAGGCCACAG 900
DuxG4   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG5   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG6   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTAGGCCACAG 900
DuxG7   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG8   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTAGGCCACAG 900
DuxG9   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG10  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG11  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTAGGCCACAG 900
DuxG12  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG13  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG14  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG15  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG16  TTGGATGGAGACCCTGGTGGCAGGGTGTATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG17  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG18  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG19  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG20  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG21  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG22  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
DuxG23  TTGGATGGAGACCCTGGTGGCAGGGTTCATGAAGGTTCCCAGGAGAGCTTTTGGCCACAG 900
                                  **                            *
```

```
Dux     GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG1   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG2   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG3   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG4   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG5   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG6   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG7   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG8   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG9   GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG10  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG11  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG12  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG13  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG14  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG15  GAAGAAGCAGGAAGTACAGGCCTGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG16  GAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG17  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG18  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG19  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG20  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG21  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG22  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
DuxG23  GAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAACTCCTTCTGC 960
                            *              *

Dux     AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG1   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG2   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG3   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG4   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG5   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG6   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG7   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG8   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG9   AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG10  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG11  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG12  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG13  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG14  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG15  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG16  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG17  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG18  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG19  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG20  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG21  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG22  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020
DuxG23  AGAGAGTCCCAGCCTTCCCAAGTGGCACAGCCCTGTGGAGCGGGCCAAGAAGATGCCCGC 1020

Dux     ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG1   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG2   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG3   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG4   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG5   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG6   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG7   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG8   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG9   ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG10  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG11  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG12  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG13  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTAATCAACTGCTGGAAGAA 1080
DuxG14  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG15  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG16  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG17  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG18  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG19  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG20  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG21  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG22  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
DuxG23  ACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTGCTGGACGAA 1080
                                                  *              *
```

```
Dux      GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG1    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG2    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG3    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG4    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG5    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG6    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG7    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG8    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG9    GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG10   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG11   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG12   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG13   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG14   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG15   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG16   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG17   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG18   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG19   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG20   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG21   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG22   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140
DuxG23   GTCCAAAAGGAAGAGCATGTGCCAGTCCCACTGGATTGGGGTAGAAATCCTGGCAGCAGG 1140


Dux      GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG1    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG2    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG3    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG4    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG5    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG6    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG7    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG8    GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG9    GAGCATGAAGATTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG10   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG11   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG12   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG13   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG14   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG15   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG16   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG17   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG18   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG19   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG20   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG21   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG22   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
DuxG23   GAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGTAAATTCGGGCATG 1200
                   *


Dux      GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG1    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG2    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG3    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG4    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG5    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG6    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG7    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG8    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG9    GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG10   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG11   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG12   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG13   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG14   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG15   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG16   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG17   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG18   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG19   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG20   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG21   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG22   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
DuxG23   GATACCTCGATCCCTAGCATCTGGCCAACCTTCTGCAGAGAATCCCAGCCTCCCCAAGTG 1260
```

```
Dux      GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG1    GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG2    GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG3    GCACAGCCCTCTGGACCAGGCCAAGCACCGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG4    GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG5    GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG6    GCACAGCCCTCTGGACCAGGCCAAGCACCGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG7    GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG8    GCACAGCCCTCTGGACCAGGCCAAGCACCGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG9    GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG10   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG11   GCACAGCCCTCTGGACCAGGCCAAGCACCGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG12   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG13   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG14   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG15   GCACAGCCCTCTGGACCAGGCCAAGCACCGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG16   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG17   GCACAGCCCTCTGGACCAGGCCAAGCACCGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG18   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG19   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG20   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG21   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG22   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
DuxG23   GCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCACTCAAGGTGGGAACACGGACCCC 1320
                                     *

Dux      CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG1    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG2    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG3    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG4    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG5    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG6    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG7    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG8    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG9    CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG10   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG11   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG12   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG13   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG14   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG15   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG16   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG17   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG18   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG19   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG20   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG21   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG22   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380
DuxG23   CTGGAGCTCTTCCTCTATCAACTGTTGGATGAAGTCCAAGTAGAAGAGCATGCTCCAGCC 1380


Dux      CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG1    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG2    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG3    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG4    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG5    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG6    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG7    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG8    CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTTGTGGGAGAGCTTT 1440
DuxG9    CCTCTGAATTGGGATGTAGATTCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG10   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG11   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTTGTGGGAGAGCTTT 1440
DuxG12   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG13   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG14   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG15   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG16   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG17   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTTGTGGGAGAGCTTT 1440
DuxG18   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG19   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG20   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG21   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG22   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGTGCATGAAGGTTCGTGGGAGAGCTTT 1440
DuxG23   CCTCTGAATTGGGATGTAGATCCTGGTGGCAGGGGGCATGAAGGTTCGTGGGAGAGCTTT 1440
                             *                  *              *
```

```
Dux     TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG1   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG2   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG3   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG4   TGGCCACAGGAAGAAGCAGGAAGTACAGGCATGGATACTTCTAGCCCCAGCGACTCAAAC 1500
DuxG5   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG6   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG7   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG8   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG9   TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG10  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG11  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG12  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG13  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG14  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG15  AGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG16  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG17  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG18  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG19  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAGAC 1500
DuxG20  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG21  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAGAC 1500
DuxG22  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
DuxG23  TGGCCACAGGAAGAAGCAGGAAGTACAGGCCTGGATACTTCAAGCCCCAGCGACTCAAAC 1500
        *                                *        *                *

Dux     TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG1   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG2   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG3   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG4   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG5   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG6   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG7   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG8   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG9   TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG10  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG11  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG12  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG13  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG14  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG15  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG16  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG17  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG18  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG19  TCCTTCTGCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG20  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG21  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG22  TCCTTCTTCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560
DuxG23  TCCTTCTGCAGAGAGTCCAAGCCTTCCCAAGTGGCACAGCGCCGTGGAGCGGGCCAAGAA 1560

Dux     GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG1   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG2   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG3   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG4   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG5   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG6   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG7   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG8   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG9   GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG10  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG11  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG12  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG13  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTG 1620
DuxG14  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG15  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG16  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG17  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG18  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG19  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCCTTGATCAACTG 1620
DuxG20  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG21  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG22  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
DuxG23  GATGCCCGCACTCAAGCAGACAGCACAGGCCCTCTGGAACTCCTCCTCTTTGATCAACTG 1620
                                                     *
```

```
Dux      C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG1    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG2    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG3    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG4    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG5    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG6    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG7    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG8    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG9    C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG10   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG11   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG12   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG13   C TGGAC AAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG14   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG15   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG16   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG17   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG18   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG19   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG20   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG21   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG22   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
DuxG23   C TGGACGAAGTCCAAAAGGAAGAGCATGTGCCAGCCCCACTGGATTGGGGTAGAAATCCT 1680
                   *

Dux      GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG1    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG2    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG3    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG4    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG5    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG6    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG7    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG8    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG9    GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG10   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG11   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG12   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG13   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG14   GGCAGCA GGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG15   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG16   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG17   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG18   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG19   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG20   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG21   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG22   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
DuxG23   GGCAGCATGGAGCATGAAGGTTCCCAGGACAGCTTACTGCCCCTGGAGGAAGCAGCAAAT 1740
                   *

Dux      TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG1    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG2    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG3    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG4    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG5    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG6    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG7    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG8    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG9    TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG10   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG11   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG12   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG13   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG14   TCGGGCA TGGATACCTCGATCCCTAGCATCTGGCCA ACCTTCTGCAGA GAATCCCAGCCT 1800
DuxG15   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG16   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG17   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG18   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG19   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG20   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG21   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG22   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
DuxG23   TCGGGCAGGGATACCTCGATCCCTAGCATCTGGCCAGCCTTCTGCAGAAAATCCCAGCCT 1800
                   *                              *           *
```

```
Dux     CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG1   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG2   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG3   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG4   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG5   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG6   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG7   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG8   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG9   CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG10  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG11  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG12  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG13  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG14  CCCCAAGTGGCACAGCCCTCTGGACCAGGCAAAGCACAGGCCCCGACTCAAGGTGGGAAC 1860
DuxG15  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG16  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG17  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG18  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG19  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG20  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG21  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG22  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
DuxG23  CCCCAAGTGGCACAGCCCTCTGGACCAGGCCAAGCACAGGCCCCCATTCAAGGTGGGAAC 1860
                                      *                 * *

Dux     ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG1   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG2   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG3   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG4   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG5   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG6   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG7   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG8   ACGGACCCCCTGGAGCTCTTCCTTGATCAATTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG9   ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG10  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG11  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG12  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG13  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG14  ACGGACCCTCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG15  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG16  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG17  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG18  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG19  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG20  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG21  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG22  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
DuxG23  ACGGACCCCCTGGAGCTCTTCCTTGATCAACTGCTGACCGAAGTCCAACTTGAGGAGCAG 1920
                  *                            *

Dux     GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG1   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG2   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG3   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG4   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG5   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG6   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG7   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG8   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG9   GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG10  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG11  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG12  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG13  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG14  GGGCCTTCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG15  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG16  GGGCCGGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG17  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG18  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG19  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG20  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGGTCTG 1980
DuxG21  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG22  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
DuxG23  GGGCCTGCCCCTGTGAATGTGGAGGAAACATGGGAGCAAATGGACACAACACCTGATCTG 1980
             * *                                                  *
```

```
Dux       C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG1     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG2     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG3     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG4     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG5     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG6     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG7     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG8     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG9     C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG10    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG11    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG12    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG13    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG14    C C T C T C A C T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG15    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG16    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG17    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG18    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG19    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG20    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG21    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG22    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
DuxG23    C C T C T C A C T T C A G A A G A A T A T C A G A C T C T T C T A G A T A T G C T C T G A  2025
                          *
```

Supplemental Figure S1. The nucleotide sequences of *Dux* family genes
The *Dux* sequence (top) was referenced from NCBI database. Red letters indicate the mutation sites when compared with the *Dux* sequence.
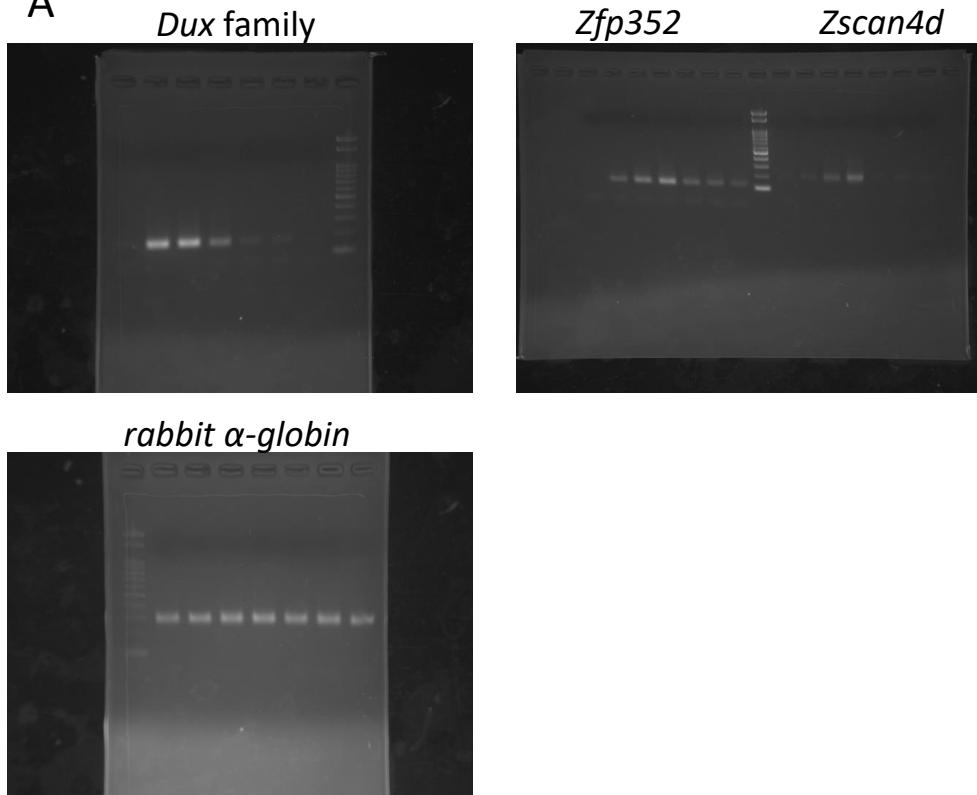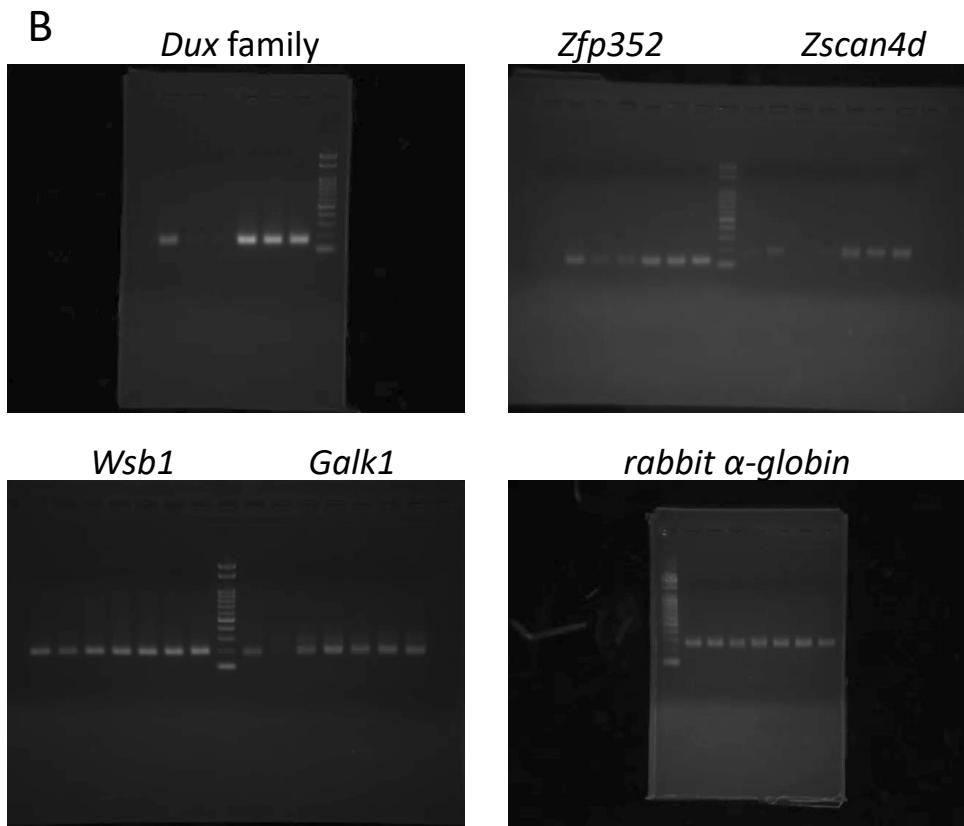
Supplemental Fig. S2

```
Dux      - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR1    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR2    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR3    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR4    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR5    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR6    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGAC 60
DuxR7    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR8    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR9    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGAC 60
DuxR10   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR11   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR12   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR13   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
DuxR14   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 31 AGTGGTGTGGCACGGGAATCCCGGCGGCGC 60
                                                                                                   *

Dux      AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR1    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR2    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR3    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR4    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR5    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR6    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR7    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR8    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR9    AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR10   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR11   AGGAAGACGGTTTGGCAGGCCGGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR12   AGGAAGACAGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR13   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
DuxR14   AGGAAGACGGTTTGGCAGGCCTGGCAAGAGCAGGCCCTGCTATCAACTTTCAAGAAGAAG 120
                 *                    *

Dux      AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR1    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR2    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR3    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR4    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR5    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCAAATGGGGGGTCTCAGATTGC 180
DuxR6    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR7    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR8    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR9    AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR10   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCAAATGGGGGGTCTCAGATTGC 180
DuxR11   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR12   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR13   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
DuxR14   AGATACCTGAGCTTCAAGGAGAGGAAGGAGCTGGCCAAGCGAATGGGGGGTCTCAGATTGC 180
                                                 *

Dux      CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR1    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR2    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAAAGGAGGGGCATGCCTCA 240
DuxR3    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR4    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR5    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR6    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR7    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR8    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR9    CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR10   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR11   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR12   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR13   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
DuxR14   CGCATCCGCGTGTGGTTTCAGAACCGCAGGAATCGCAGTGGAGAGGAGGGGCATGCCTCA 240
                                                   *

Dux      AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR1    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR2    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR3    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR4    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR5    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR6    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR7    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR8    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR9    AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR10   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR11   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR12   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR13   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
DuxR14   AAGAGGTCCATCAGAGGCTCCAGGCGGCTAGCCTCGCCACAGCTCCAGGAAGAGCTTGGA 300
```

```
Dux      TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR1    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR2    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR3    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR4    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR5    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR6    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR7    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR8    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR9    TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR10   TCCAGGCCAC**G**GGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR11   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR12   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR13   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
DuxR14   TCCAGGCCACAGGGTAGAGGCATGCGCTCATCTGGCAGAAGGCCTCGCACTCGACTCACC 360
                   *

Dux      TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR1    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR2    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR3    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR4    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR5    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAA**T**CCACGACCAGGCTTTGCT 420
DuxR6    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR7    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR8    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR9    TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR10   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAA**T**CCACGACCAGGCTTTGCT 420
DuxR11   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR12   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR13   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
DuxR14   TCGCTACAGCTCAGGATCCTAGGGCAAGCCTTTGAGAGGAACCCACGACCAGGCTTTGCT 420
                                                 *

Dux      ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR1    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR2    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR3    ACCAGGGAGGAGCTGGCGCGTGACACAGGG**A**TGCCCGAGGACACGATCCACATATGGTTT 480
DuxR4    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR5    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR6    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR7    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR8    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR9    ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR10   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR11   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR12   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR13   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
DuxR14   ACCAGGGAGGAGCTGGCGCGTGACACAGGGTTGCCCGAGGACACGATCCACATATGGTTT 480
                                      *

Dux      CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR1    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR2    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR3    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR4    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR5    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR6    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR7    CAAAACCGAAGAGCTCGGCGGCGCCACAG**A**AGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR8    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR9    CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR10   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR11   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR12   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR13   CAAAACCGAAGAGCTCGGCGGCGCCACAG**A**AGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
DuxR14   CAAAACCGAAGAGCTCGGCGGCGCCACAGGAGGGGCAGGCCCACAGCTCAAGATCAAGAC 540
                                      *

Dux      TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR1    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR2    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR3    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR4    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR5    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR6    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR7    TTGCTGGC**A**TCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR8    TTGCTGG**T**GTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR9    TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR10   TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR11   TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR12   TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR13   TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
DuxR14   TTGCTGGCGTCACAAGGGTCGGATGGGGCCCCTGCAGGTCCGGAAGGCAGAGAGCGTGAA 600
                 * *
```

```
Dux     GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR1   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR2   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR3   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR4   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR5   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR6   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR7   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGGATGGATACCTCG 660
DuxR8   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR9   GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR10  GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR11  GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACCGGCATGGATACCTCG 660
DuxR12  GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR13  GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGGAAGTACGGGCATGGATACCTCG 660
DuxR14  GGTGCCCAGGAGAACTTGTTGCCACAGGAAGAAGCAGAAAGTACGGGCATGGATACCTCG 660
                                             *          *   *

Dux     AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR1   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR2   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR3   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR4   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR5   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR6   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR7   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR8   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR9   AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR10  AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR11  AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR12  AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR13  AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720
DuxR14  AGCCCTAGCGACTTGCCCTCCTTCTGCGGAGAGTCCCAGCCTTTCCAAGTGGCACAGCCC 720

Dux     CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR1   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR2   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR3   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR4   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAAACC 780
DuxR5   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR6   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR7   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR8   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR9   CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR10  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR11  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR12  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCAAGCAGGCAACGCAGGCTCTCTGGAACCC 780
DuxR13  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAAACC 780
DuxR14  CGTGGAGCAGGCCAACAAGAGGCCCCCACTCGAGCAGGCAACGCAGGCTCTCTGGAACCC 780
                                       *                        *

Dux     CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR1   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR2   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR3   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR4   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR5   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR6   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR7   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR8   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR9   CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR10  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR11  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR12  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR13  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840
DuxR14  CTCCTTGATCAGCTGCTGGATGAAGTCCAAGTAGAAGAGCCTGCTCCAGCCCCTCTGAAT 840

Dux     TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR1   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR2   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR3   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR4   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR5   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR6   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR7   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR8   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR9   TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR10  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR11  TTGGATGGAGACCCTGGTGGCAGGGTGTATGAAGGTTCCCAGGAGAGCT 889
DuxR12  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR13  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
DuxR14  TTGGATGGAGACCCTGGTGGCAGGGTGCATGAAGGTTCCCAGGAGAGCT 889
                                   *
```

Supplemental Figure S2. Nucleotide sequences of *Dux* family mRNA expressed in early preimplantation embryos

The sequences of *Dux* family transcripts (31 to 889 bps) are aligned. The *Dux* sequence (top) was referenced from NCBI database. Red letters indicate the mutation sites when compared with the *Dux* sequence.

Supplemental Fig. S3

```
Dux      11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR1    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR2    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR3    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR4    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR5    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K **Q** M G V S D C 60
DuxR6    11 S G V A R E S R R **H** R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR7    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR8    11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR9    11 S G V A R E S R R **H** R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR10   11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K **Q** M G V S D C 60
DuxR11   11 S G V A R E S R R R R K T V W Q A **G** Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR12   11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR13   11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
DuxR14   11 S G V A R E S R R R R K T V W Q A W Q E Q A L L S T F K K K R Y L S F K E R K E L A K R M G V S D C 60
                    *                    *                                               *

Dux         R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR1       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR2       R I R V W F Q N R R N R S G **K** E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR3       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR4       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR5       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR6       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR7       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR8       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR9       R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR10      R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P **R** G R G M R S S G R R P R T R L T 120
DuxR11      R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR12      R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR13      R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
DuxR14      R I R V W F Q N R R N R S G E E G H A S K R S I R G S R R L A S P Q L Q E E L G S R P Q G R G M R S S G R R P R T R L T 120
                            *                                                           *

Dux         S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR1       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR2       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR3       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G **M** P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR4       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR5       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR6       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR7       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR8       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR9       S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR10      S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR11      S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR12      S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR13      S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
DuxR14      S L Q L R I L G Q A F E R N P R P G F A T R E E L A R D T G L P E D T I H I W F Q N R R A R R R H R R G R P T A Q D Q D 180
                                                        *

Dux         L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR1       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR2       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR3       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR4       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR5       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR6       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR7       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR8       L L **V** S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR9       L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR10      L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR11      L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR12      L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR13      L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A G S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
DuxR14      L L A S Q G S D G A P A G P E G R E R E G A Q E N L L P Q E E A **E** S T G M D T S S P S D L P S F C G E S Q P F Q V A Q P 240
                *                                               *

Dux         R G A G Q Q E A P T R A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR1       R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR2       R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR3       R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR4       R G A G Q Q E A P T R A G N A G S L E **T** L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR5       R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR6       R G A G Q Q E A P T R A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR7       R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR8       R G A G Q Q E A P T R A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR9       R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR10      R G A G Q Q E A P T R A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR11      R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V **Y** E G S Q E S 296
DuxR12      R G A G Q Q E A P T **Q** A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR13      R G A G Q Q E A P T R A G N A G S L E **T** L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
DuxR14      R G A G Q Q E A P T R A G N A G S L E P L L D Q L L D E V Q V E E P A P A P L N L D G D P G G R V H E G S Q E S 296
                        *                    *                                           *
```

Supplemental Figure S3. *A*mino acid sequences of *Dux* families
The sequences of *Dux* family mRNAs in Supplemental Figure 2 were translated to those of amino acids. Red letters indicate the mutation sites when compared with the *Dux* sequence. Although the nucleotide sequences were different, DuxR1, DuxR7 and R12 code the same amino acid sequence, and so do DuxR4 and DuxR13.

A

Dux family

Zfp352   *Zscan4d*

rabbit α-globin

B

Dux family

Zfp352   *Zscan4d*

Wsb1   *Galk1*

rabbit α-globin

Supplemental Figure S4. Original electrophoresis images
These are uncropped images of electrophoresis gels in Fig. 1A **(A)** and Fig. 3A **(B)**.