

Supplementary Information: Optimizing a Male Reproductive Aging Mouse Model by D-Galactose Injection

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Table S1. List of expressional changes of up-regulated and down-regulated genes from D-gal-injected mice.

Gene	Full Name	Fold
Up-regulated genes		
<i>Gpx3</i>	Glutathione peroxidase 3	13.1
<i>C3</i>	Complement component 3	8.5
<i>H2-Aa</i>	Histocompatibility 2, class II antigen A, α	6.9
<i>Ctss</i>	Cathepsin S	6.3
<i>Cylc2</i>	Cylicin, basic protein of sperm head cytoskeleton 2	5.6
<i>H2-Eb1</i>	Histocompatibility 2, class II antigen E β	5.2
<i>Psmb7</i>	Proteasome (prosome, macropain) subunit, β type 7	4.3
<i>Frg1</i>	FSHD region gene 1	4.2
<i>Safb2</i>	Scaffold attachment factor B2	4.1
<i>Gbp2</i>	Guanylate binding protein 2	4
<i>B2m</i>	β -2 microglobulin	4
<i>Tbx3</i>	T-box 3	3.8
<i>Snrpa</i>	Small nuclear ribonucleoprotein polypeptide A	3.7
<i>Smarca2</i>	SWI/SNF related, matrix associated, actin dependent regulator of Chromatin, subfamily a, member 2	3.7
<i>Gm13237</i>	Predicted gene 13237	3.6
<i>Cep85l</i>	Centrosomal protein 85-like	3.5
<i>Dcn</i>	Decorin	3.2
<i>Nme8</i>	NME/NM23 family member 8	3.2
<i>Dhx9</i>	DEAH (Asp-Glu-Ala-His) box polypeptide 9	3.2
<i>Dnajb11</i>	DnaJ (Hsp40) homolog, subfamily B, member 11	3.2
<i>Sltm</i>	SAFB-like, transcription modulator	3.1
<i>Fus</i>	Fused in sarcoma	3.1
<i>Anxa1</i>	Annexin A1	3.1
<i>Ly86</i>	Lymphocyte antigen 86	3
<i>Hpgd</i>	Hydroxyprostaglandin dehydrogenase 15 (NAD)	3
<i>Ccdc112</i>	Coiled-coil domain containing 112	3
<i>Efcab2</i>	EF-hand calcium binding domain 2	3
<i>C1qc</i>	Complement component 1, q subcomponent, C chain	3
<i>Dnajc21</i>	DnaJ (Hsp40) homolog, subfamily C, member 21	2.9
<i>Ccl8</i>	Chemokine (C-C motif) ligand 8	2.9
<i>Ccdc186</i>	Coiled-coil domain containing 186	2.9
<i>Plagl1</i>	Pleomorphic adenoma gene-like 1	2.8
<i>Amy1</i>	Amylase 1, salivary	2.8
<i>Cdkl2</i>	Cyclin-dependent kinase-like 2 (CDC2-related kinase)	2.8
<i>Nucb2</i>	Nucleobindin 2	2.8
<i>Ifitm2</i>	Interferon induced transmembrane protein 2	2.8

Table S1. Cont.

Gene	Full Name	Fold
<i>Dock8</i>	Dedicator of cytokinesis 8	2.8
<i>Slc24a5</i>	Solute carrier family 24, member 5	2.7
<i>Fam98b</i>	Family with sequence similarity 98, member B	2.7
<i>Gstm2</i>	Glutathione S-transferase, mu 2	2.7
<i>Stx4a</i>	Syntaxin 4A (placental)	2.7
<i>Ik</i>	IK cytokine	2.7
<i>Mki67</i>	Antigen identified by monoclonal antibody Ki 67	2.7
<i>Nsmce2</i>	Non-SMC element 2 homolog (MMS21, <i>S. cerevisiae</i>)	2.6
<i>Efemp1</i>	Epidermal growth factor-containing fibulin-like extracellular Matrix protein 1	2.6
<i>Dnajc2</i>	DnaJ (Hsp40) homolog, subfamily C, member 2	2.6
<i>Snrnp70</i>	Small nuclear ribonucleoprotein 70 (U1)	2.6
<i>Wfdc17</i>	WAP four-disulfide core domain 17	2.5
<i>Hpgd</i>	Hydroxyprostaglandin dehydrogenase 15 (NAD)	2.5
<i>Leo1</i>	Leo1, Paf1/RNA polymerase II complex component, homolog	2.5
<i>Cenpe</i>	Centromere protein E	2.5
<i>Fam71d</i>	Family with sequence similarity 71, member D	2.5
<i>Zmynd11</i>	Zinc finger, MYND domain containing 11	2.5
<i>Zfml</i>	Zinc finger, matrin-like	2.5
<i>Sult1e1</i>	Sulfotransferase family 1E, member 1	2.4
<i>Irf7</i>	Interferon regulatory factor 7	2.4
<i>C1ra C1rb</i>	Complement component 1, r subcomponent A complement Component 1, r subcomponent B	2.4
<i>Ccdc104</i>	Coiled-coil domain containing 104	2.4
<i>Wdr66</i>	WD repeat domain 66	2.4
<i>Nae1</i>	NEDD8 activating enzyme E1 subunit 1	2.4
<i>Col4a3bp</i>	Collagen, type IV, α 3 (Goodpasture antigen) binding protein	2.4
<i>Hk1</i>	Hexokinase 1	2.4
<i>Phyh</i>	Phytanoyl-CoA hydroxylase	2.4
<i>Gm136</i>	Predicted gene 136	2.4
<i>Hey1</i>	Hairy/enhancer-of-split related with YRPW motif 1	2.4
<i>Ccdc66</i>	Coiled-coil domain containing 66	2.4
<i>Aldh1a7</i>	Aldehyde dehydrogenase family 1, subfamily A7	2.4
<i>Nemf</i>	Nuclear export mediator factor	2.4
<i>Hsd3b1</i>	Hydroxy- δ -5-steroid dehydrogenase, 3 β - and steroid δ -isomerase 1	2.4
<i>Hirip3</i>	HIRA interacting protein 3	2.3
<i>Ncl</i>	Nucleolin	2.3
<i>Tmem176b</i>	Transmembrane protein 176B	2.3
<i>Wasf2</i>	WAS protein family, member 2	2.3
<i>Fxr1</i>	Fragile X mental retardation gene 1, autosomal homolog	2.3
<i>Gpatch4</i>	G patch domain containing 4	2.3
<i>Gucy1a3</i>	Guanylate cyclase 1, soluble, α 3	2.3
<i>Ino80b</i>	INO80 complex subunit B	2.3
<i>Cdk11b</i>	Cyclin-dependent kinase 11B	2.3
<i>Morf4l2</i>	Mortality factor 4 like 2 mortality factor 4-like protein 2-like	2.3
<i>Serpinf1</i>	Serine (or cysteine) peptidase inhibitor, clade F, member 1	2.3
<i>Top2a</i>	Topoisomerase (DNA) II α	2.3

Table S1. Cont.

Gene	Full Name	Fold
<i>Nipbl</i>	Nipped-B homolog (<i>Drosophila</i>)	2.3
<i>Gm4907</i>	Predicted gene 4907	2.3
<i>Ankrd36</i>	Ankyrin repeat domain 36	2.3
<i>Pltp</i>	Phospholipid transfer protein	2.2
<i>Igf2bp2</i>	Insulin-like growth factor 2 mRNA binding protein 2	2.2
<i>Senp5</i>	SUMO/sentrin specific peptidase 5	2.2
<i>Plcb1</i>	Phospholipase C, β 1	2.2
<i>Dcn</i>	Decorin	2.2
<i>Sumo1</i>	Small ubiquitin-like modifier 1	2.2
<i>Dnttip2</i>	Deoxynucleotidyltransferase, terminal, interacting protein 2	2.2
<i>Zrsr1</i>	Zinc finger (CCCH type), RNA binding motif and serine/arginine rich 1	2.2
<i>Utp3</i>	UTP3, small subunit (SSU) processome component, homolog (<i>S. cerevisiae</i>)	2.2
<i>Cabyr</i>	Calcium-binding tyrosine-(Y)-phosphorylation regulated (fibrousheathin 2)	2.2
<i>Anp32e</i>	Acidic (leucine-rich) nuclear phosphoprotein 32 family, member E	2.2
<i>Pinx1</i>	PIN2/TERF1 interacting, telomerase inhibitor 1	2.2
<i>Epsti1</i>	Epithelial stromal interaction 1 (breast)	2.2
<i>Nop56</i>	NOP56 ribonucleoprotein	2.2
<i>Ndc80</i>	NDC80 homolog, kinetochore complex component (<i>S. cerevisiae</i>)	2.2
<i>Smim24</i>	Small integral membrane protein 24	2.2
<i>Ccdc173</i>	Coiled-coil domain containing 173	2.2
<i>Hnrnpul2</i>	Heterogeneous nuclear ribonucleoprotein U-like 2	2.2
<i>Acsl4</i>	Acyl-CoA synthetase long-chain family member 4	2.1
<i>Aggf1</i>	Angiogenic factor with G patch and FHA domains 1	2.1
<i>Zpbp2</i>	Zona pellucida binding protein 2	2.1
<i>F13a1</i>	Coagulation factor XIII, A1 subunit	2.1
<i>Atg3</i>	Autophagy related 3	2.1
<i>Fhad1</i>	Forkhead-associated (FHA) phosphopeptide binding domain 1	2.1
<i>Tns1</i>	Tensin 1	2.1
<i>Senp2</i>	SUMO/sentrin specific peptidase 2	2.1
<i>Mapk1ip1</i>	Mitogen-activated protein kinase 1 interacting protein 1	2.1
<i>Grk1</i>	G protein-coupled receptor kinase 1	2.1
<i>Wdr43</i>	WD repeat domain 43	2.1
<i>Kank2</i>	KN motif and ankyrin repeat domains 2	2.1
<i>Rrbp1</i>	Ribosome binding protein 1	2.1
<i>Terf1</i>	Telomeric repeat binding factor 1	2.1
<i>Rdx</i>	Radixin	2.1
<i>Sult1a1</i>	Sulfotransferase family 1A, phenol-preferring, member 1	2.1
<i>Pdgfra</i>	Platelet derived growth factor receptor, α polypeptide	2.1
<i>Csnka2ip</i>	Casein kinase 2, α prime interacting protein	2.1
<i>Snrnp48</i>	Small nuclear ribonucleoprotein 48 (U11/U12)	2.1
<i>Wdr26</i>	WD repeat domain 26	2
<i>Tmco5</i>	Transmembrane and coiled-coil domains 5	2
<i>Suco</i>	SUN domain containing ossification factor	2
<i>Polr3gl</i>	Polymerase (RNA) III (DNA directed) polypeptide G like	2
<i>Ddr2</i>	Discoidin domain receptor family, member 2	2

Table S1. Cont.

Gene	Full Name	Fold
<i>Speer2</i>	Spermatogenesis associated glutamate (E)-rich protein 2	2
<i>Rwdd1</i>	RWD domain containing 1	2
<i>Tshz2</i>	Teashirt zinc finger family member 2	2
Down-regulated genes		
Gene_symbol	Description	Fold
<i>Rn28s1</i>	28S ribosomal RNA	0.28
<i>Snord13</i>	Small nucleolar RNA, C/D box 13	0.32
<i>Snord118</i>	Small nucleolar RNA, C/D box 118	0.36
<i>2900060B14Rik</i>	RIKEN cDNA 2900060B14 gene	0.37
<i>Rs5-8s1</i>	5.8S ribosomal RNA	0.37
<i>Rn18s</i>	18S ribosomal RNA	0.38
<i>Rn7sk</i>	RNA, 7SK, nuclear	0.41
<i>Cyp4f39</i>	Cytochrome P450, family 4, subfamily f, polypeptide 39	0.45
<i>Lbr</i>	Lamin B receptor	0.45
<i>Comp</i>	Cartilage oligomeric matrix protein	0.46
<i>Npas1</i>	Neuronal PAS domain protein 1	0.46
<i>Pomc</i>	Pro-opiomelanocortin- α	0.47
<i>Pfn1</i>	Profilin 1	0.47
<i>Zdhhc1</i>	Zinc finger, DHHC domain containing 1	0.48
<i>Lrrc29</i>	Leucine rich repeat containing 29	0.48
<i>Katnb1</i>	Katanin p80 (WD40-containing) subunit B 1	0.48
<i>Nek8</i>	NIMA (never in mitosis gene a)-related expressed kinase 8	0.49
<i>Mau2</i>	MAU2 chromatid cohesion factor homolog (<i>C. elegans</i>)	0.49
<i>Sec1</i>	Secretory blood group 1	0.49
<i>Cnnm4</i>	Cyclin M4	0.49

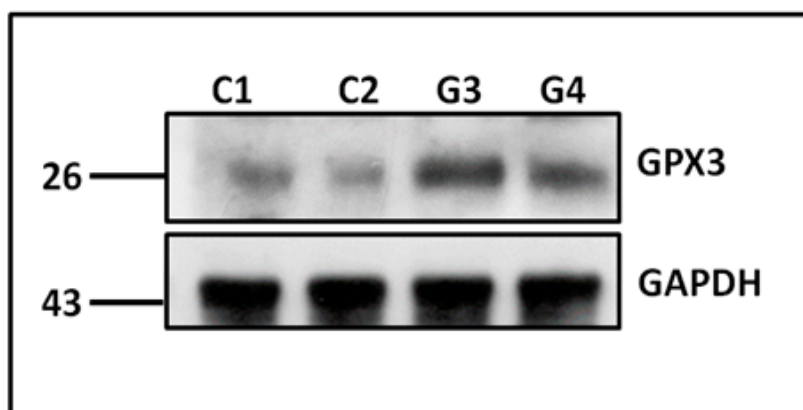


Figure S1. The expressional levels of GPX3 in testis from D-gal injection and control mice. Western blot analysis of testis by D-galactose injection (G3 and G4) and controls (C1 and C2) using an anti-GPX3 and an anti-GAPDH antibody.