

## SUPPLEMENTAL INFORMATION:

**Supplemental Table 1.** Energy metabolism-related miRNAs up-regulated in old kidney and target genes

MiRNA name	Target gene symbol	Target gene name (mitochondrial respiratory chain-related genes)
rno-miR-141	Cyb5	Cytochrome b5
rno-miR-184	Cyb5b	Cytochrome b5 type B
rno-miR-142-5p,7a	Cyb5r4	Cytochrome b5 reductase 4
rno-miR-542-3p	Cyc1	Cytochrome c1 heme protein
rno-miR-340-5p	COX1	Cytochrome c oxidase subunit 1
rno-miR-333	COX2, 7AP2, 7C, 15, 19	Cytochrome c oxidase subunit 2, VIIa, 7C, 15, 19
rno-miR-708	Cox4i1	Cytochrome c oxidase subunit 4 isoform 1
rno-miR-223	Cox6a2, 7b2	Cytochrome c oxidase polypeptide Via, VIIb2
rno-miR-142-5p	Cox7b	Cytochrome c oxidase subunit VIIb
rno-miR-34c	Cox8h	Cytochrome c oxidase polypeptide VIII
rno-miR-224	Cox15	Cytochrome c oxidase assembly protein
rno-miR-350, 351	COX19	Cytochrome c oxidase assembly protein
rno-miR-34a	Etfb	Electron transfer flavoprotein subunit beta
rno-miR-142-5p	Etfdh	Electron transfer flavoprotein-ubiquinone oxidoreductase
rno-miR-333	UQCRC1	Ubiquinol-cytochrome-c reductase complex core protein1, 2
rno-miR-350	Atp5a1, 5c1	ATP synthase subunit alpha, gamma
rno-miR-141	Atp5c1	ATP synthase gamma chain
rno-miR-223, 333, 7a	Atp5e	ATP synthase epsilon chain
rno-miR-224	Atp5f1	ATP synthase B chain
rno-miR-212	Atp5g3	ATP synthase lipid-binding protein
rno-miR-542-3p	Atp5o	ATP synthase O subunit
rno-miR-141	Ndufs4	NADH dehydrogenase [ubiquinone] iron-sulfur protein 4
rno-miR-21	Ndufs5b	NADH dehydrogenase (ubiquinone) Fe-S protein 5b
rno-miR-34a	Ndufs7	NADH dehydrogenase (ubiquinone) Fe-S protein 7
rno-miR-184	Ndufa4l2	NADH dehydrogenase(ubiquinone)1alpha subcomplex, 4-like 2
rno-miR-224	Ndufb2	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2
rno-miR-542-3p	Ndufb5	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5
	Ndufv2	NADH dehydrogenase [ubiquinone] flavoprotein
rno-miR-223,333	NU4M	NADH-ubiquinone oxidoreductase chain 4
rno-miR-223	Sdha	Succinate dehydrogenase [ubiquinone] flavoprotein subunit
rno-miR-184, 351	Sdhc	Succinate dehydrogenase complex, subunit C
rno-miR-132, 212	Sdhd	Succinate dehydrogenase[ubiquinone] cytochrome b small subunit
rno-miR-184	Polg	Mitochondrial DNA polymerase catalytic subunit
rno-miR-350	Tfam	Mitochondrial Transcription factor A
rno-miR-132,212,7a	Mtif2	Mitochondrial translational initiation factor 2
rno-miR-542-3p	Tfb2m	Mitochondrial dimethyladenosine transferase 2
MiRNA name	Target gene symbol	Target gene name (energy metabolism-regulating genes)
rno-miR-212	FoxA1, FoxO3a	Forkhead box protein A1, O3A
	AMPK $\beta$ -2	5'-AMP-activated protein kinase $\beta$ -2 chain

rno-miR-132,212	AMPK $\gamma$ -1	5'-AMP-activated protein kinase $\gamma$ -1 chain
	IGFBP-6	Insulin-like growth factor-binding protein 6
rno-miR-333	AMPK $\alpha$ -2, $\beta$ -1	5'-AMP-activated protein kinase $\alpha$ -2, $\beta$ -1 chains
rno-miR-142-5p, 333	PPAR- $\gamma$	Peroxisome proliferator-activated receptor $\gamma$
rno-miR-351	LEP	Leptin

**Supplemental Table 2.** Cell proliferation-related miRNAs differentially expressed in old kidney and target genes

<b>MiRNA up-regulated</b>	<b>Target gene symbol</b>	<b>Target gene name</b>
rno-miR-142-5p	eIF4EBP1	Eukaryotic translation initiation factor 4E-binding protein 1
	TAF13	Transcription initiation factor TFIID subunit 13
rno-miR-184	CDK6	Cyclin-dependent kinase 6
	GTF2I	General transcription factor II I
	E2F1	Transcription factor E2F1
rno-miR-21	PCNA	Proliferating cell nuclear antigen
	CDK10	Cell division protein kinase 10
rno-miR-212	E2F5	Transcription factor E2F5
	EIF4A2	Eukaryotic initiation factor 4A-II
rno-miR-223	CDK2	Cell division protein kinase 2
	CCNA1	Cyclin A1
rno-miR-224	CDK7	Cell division protein kinase 7
	PCNA	Proliferating Cell Nuclear Antigen
rno-miR-333	CCNA1,CCNE1	Cyclin A1, Cyclin E1
	CDC16	Cell division cycle protein 16
	GTF3C1	General transcription factor 3C polypeptide 1
rno-miR-335	GTF3C1	General transcription factor 3C polypeptide 1
	eIF3	Eukaryotic translation initiation factor 3 subunit
	PCNA	Proliferating cell nuclear antigen
	CDK4	Cyclin-dependent kinase 4
rno-miR-34c	CCNM3	Cyclin M3
rno-miR-542-3p	EIF2B1	Translation initiation factor eIF-2B subunit alpha
	TAF11	Transcription initiation factor TFIID subunit 11
	eEF1A2	Elongation factor 1-alpha 1
rno-miR-708	E2F6	E2F transcription factor 6
	CDK8	Cyclin-dependent kinase 8
<b>MiRNA down-regulated</b>	<b>Target gene symbol</b>	<b>Target gene name</b>
rno-miR-365	P21	Cyclin-dependent kinase inhibitor 1A
	P16Ink4a	Cyclin-dependent kinase inhibitor 2A

**Supplemental Table 3.** ECM-related miRNAs differentially expressed in old kidney and target genes

<b>MiRNA up-regulated</b>	<b>Target gene symbol</b>	<b>Target gene name (ECM degradation genes)</b>
rno-miR-223	MMP1a	Matrix metalloproteinase 1a
rno-miR-333	MMP2	Matrix metalloproteinase 2
rno-miR-132, 340-5p	MMP9	Matrix metalloproteinase 9
rno-miR-142-5p	MMP10	Matrix metalloproteinase 10
rno-miR-351	MMP11, 12	Matrix metalloproteinase 11, 12
rno-miR-212, 333	MMP13	Matrix metalloproteinase 13
rno-miR-132, 212	MMP14	Matrix metalloproteinase14
rno-miR-708	MMP15	Matrix metalloproteinase 15
rno-miR-132, 212, 340-5p	MMP16	Matrix metalloproteinase 16
rno-miR-542-3p	MMP23	Matrix metalloproteinase 23
rno-miR-333	MMP20, 25	Matrix metalloproteinase 20, 25
	PLG	Plasminogen
rno-miR-184, 335	YME1L1	ATP-dependent metalloprotease
<b>MiRNA down-regulated</b>	<b>Target gene symbol</b>	<b>Target gene name (ECM synthesis genes)</b>
rno-miR-129	VIM	Vimentin
rno-miR-290	COL4A5, 9A1	Collagen type IV alpha 5, type IX alpha 1
rno-miR-329	FGB	Fibrinogen beta chain
rno-miR-339	COL25A1	Collagen type XXV alpha 1
rno-miR-365	COL4A4, 9A3, 14A1	Collagen type IV alpha 4, type IX alpha 3, type XIV alpha 1
	FGB	Fibrinogen beta chain
rno-miR-347	COL5A3, 20A1	Collagen type V alpha 3, type XX alpha 1
	COL23A1, 26A1	Collagen type XXIII alpha 1, type XXVI alpha 1
	ELN	Elastin
	Tek2	Tektin-2
	AGRN	Agrin
	FBN3	Fibrillin-3
	FGA	Fibrinogen alpha chain
	TIMP-2	Metalloproteinase inhibitor 2 precursor
rno-miR-378	COL2a1, 5a2, 9a2	Collagen type II alpha 1, type V alpha 2, type IX alpha 2
	Ecm1	Extracellular matrix protein 1
	ITGA5	Fibronectin receptor alpha (integrin, alpha 5)
rno-miR-378*	COL11A2	Collagen, type XI, alpha 2
	TNX	Tenascin-X
rno-miR-451	COL5A3, 14A1	Collagen type V alpha 3, type XIV alpha 1
rno-miR-494	COL7A1,11A1,15A1	Collagen type VII alpha 1, type XI alpha 1, type XV alpha 1
	FGA	Fibrinogen alpha chain

**Supplemental Table 4.** Immune inflammatory-related miRNAs down-regulated in old kidney and target genes

<b>MiRNA name</b>	<b>Target gene symbol</b>	<b>Target gene name (Cytokines: IL, IFN,TNF, Chemokine, etc.)</b>
rno-miR-12	IL-2, 16, 17re	Interleukin-2, 16, 17re
	CCL24	Chemokine (C-C motif) ligand 24

rno-miR-290	IL-1 alpha	Interleukin 1 alpha
	TNFRSF5	Tumor necrosis factor receptor superfamily, member 5
	CCL28,CCR-4	Chemokine (C-C motif) ligand 28, receptor type 4
rno-miR-329	IL-13ra1	Interleukin 13 receptor, alpha 1
	CCL1	Chemokine (C-C motif) ligand 1
	LTB4-R 1	Leukotriene B4 receptor 1
	CRP	C reactive protein
	CD40LG	CD40 ligand
rno-miR-339	IL-13	T-cell activation protein P600
	TNF-beta	Lymphotoxin-alpha
rno-miR-347	IL-17RA, 19, 21R, 31RA	Interleukin-17 receptor A, 19, 21R, 31RA
	IFNGR2, RF-5	Interferon-gamma receptor beta chain,Interferon regulatory factor 5
	TNFSF10,15	Tumor necrosis factor ligand superfamily, member 10,15
	TNFRSF1A,4,5,12A	Tumor necrosis factor receptor superfamily member1A, 4, 5, 12A
	CCR-4,CX3CR1	C-C chemokine receptor type 4, CX3C chemokine receptor 1
	LTB4-R 1	Leukotriene B4 receptor 1
	LTA	lymphotoxin A
	ICAM-1, 2, 4, 5	Intercellular adhesion molecule 1, 2, 4, 5
	CD40, 40LG	CD40, CD40 ligand
	NFKB2	NF-kappa-B p100 subunit
	Rel A	NF-kappa-B p65 subunit
	rno-miR-365	IL-1F7
IFNGR		Interferon gamma receptor 1
LTB		Lymphotoxin B
rno-miR-378	IL-3, 5, 13, 18BP	Interleukin-3, 5, 13, 18BP
	IL-2rg, 20R1	Interleukin 2 receptor, gamma; 20 receptor alpha chain
	CCR-3	C-C chemokine receptor type 3
rno-miR-378*	IL-12A	Interleukin-11R-alpha, 12A
	TNFRSF5	Tumor necrosis factor receptor superfamily, member 5
	TGF-alpha	Transforming growth factor alpha
	CD40LG	CD40 ligand
rno-miR-451	IL-1RAP,13, 15, 27, 31	Interleukin-1 receptor accessory protein, 13, 15, 27, 31
	TNF-R1	Tumor necrosis factor receptor superfamily member 1A
	CCR-3	C-C chemokine receptor type 3
rno-miR-494	IL-1F6, RAK-2	Interleukin-1 family member 6, receptor-associated kinase-like 2
	IL-15	Interleukin-15
	RANKL	Tumor necrosis factor ligand superfamily member 11
	CXC-R4	C-X-C chemokine receptor type 4

<b>MiRNA name</b>	<b>Target gene symbol</b>	<b>Target gene name (Complement, Phagocyte, Toll-like receptor)</b>
rno-miR-129	Cfh	Complement component factor H
	Mst1r	Macrophage stimulating 1 receptor
rno-miR-290	C1r, C5	Complement component C1r, C5
	FcRII	Fc gamma Receptor II
rno-miR-329	C1RL,C4A	Complement component 1, r subcomponent-like; C4A

	Granzyme M	Natural killer cell granular protease
rno-miR-339	FCGR1A	High-affinity immunoglobulin gamma Fc receptor I
	TLR4	Toll-like receptor 4
rno-miR-347	C1qtnf1	C1q and tumor necrosis factor related protein 1
	C1qa	Complement component 1, q subcomponent, alpha polypeptide
	C8A, C8G	Complement component 8, alpha polypeptide; gamma chain
	GZMM	Granzyme M
rno-miR-365	CD44,CD160	Phagocytic glycoprotein 1, Natural killer cell receptor BY55
rno-miR-378	C7, Cfi, Cfb	Complement component 7, factor I, factor B
	FCGR1A	High-affinity immunoglobulin gamma Fc receptor I
	TLR4	Toll-like receptor 4
rno-miR-378*	C1RL, C4	Complement component 1, r subcomponent-like; C4
rno-miR-451	TLR10	Toll-like receptor 10

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