

Supplemental information

**Renal inflammation combined with renal
function reserve reduction accelerate kidney
aging via pentose phosphate pathway**

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Table S1. Sequences of siRNAs used, related to STRA Methods.

	Target gene	Species		Sequence (5'-3')
siRNA	G6PD	Human	Forward	GUCGUCCUCUAUGUGGAGAAU
			Reverse	AUUCUCCACAUAGAGGACGAC

Table S2. Primer sequences used for qRT-PCR analyses, related to STRA Methods.

Primer (Human)		Sequence (5'-3')
G6PD	Forward	CGAGGCCGTCACCAAGAAC
	Reverse	GTAGTGGTCGATGCGGTAGA
β -actin	Forward	CTCCATCCTGGCCTCGCTGT
	Reverse	GCTGTCACCTTCACCGTTCC

Table S3. Metabolism Product change in Kidney of UNX VS Control, related to Figure 8A.

Super Meta Pathway	Metabolism Product	Sub Meta Pathway	Mean ratio	Up/Down Regulation	Raw P value
	creatinine	Creatine Metabolism	2.515	↑	0.01218578
	sarcosine	Glycine, Serine and Threonine Metabolism	1.831	↑	0.01218578
	ethylmalonate	Leucine, Isoleucine and Valine Metabolism	2.06	↑	0.02157175
	N,N,N-trimethyl-5-aminovalerate	Lysine Metabolism	2.678	↑	0.01218578
	N2-acetyllysine		1.509	↑	0.03671386
Amino Acid	S-adenosylmethionine (SAM)	Methionine, Cysteine, SAM and Taurine Metabolism	1.879	↑	0.01218578
	5-methylthioadenosine (MTA)	Polyamine Metabolism	1.748	↑	0.02157175
	3-indoxyl sulfate		9.158	↑	0.01218578
	kynurenate	Tryptophan Metabolism	2.351	↑	0.01218578
	xanthurenate		4.532	↑	0.02157175
	N2,N5-diacetylornithine	Urea cycle; Arginine and Proline Metabolism	1.499	↑	0.01218578
	N-acetylcitrulline		2.486	↑	0.01218578
Lipid	ceramide (d18:1/14:0, d16:1/16:0)	Ceramides	0.46	↓	0.02157175
	3-hydroxypalmitoylcarnitine	Fatty Acid Metabolism (Acyl Carnitine, Hydroxy)	1.758	↑	0.02157175
	2-hydroxystearate	Fatty Acid, Monohydroxy	0.61	↓	0.01218578

	3-hydroxysebacate		1.914	↑	0.02157175
	(3'-5')-guanylylcytidine	Dinucleotide	1.623	↑	0.03671386
Nucleotide	allantoin	Purine Metabolism, (Hypo)Xanthine/Inosine containing (Purine Metabolism, (Hypo)Xanthine/Inosine containing)	2.336	↑	0.01218578
Peptide	phenylacetyl glycine	Acetylated Peptides	2.657	↑	0.01218578
Cofactors and Vitamins	ascorbic acid 3-sulfate	Ascorbate and Aldarate Metabolism	2.152	↑	0.01218578
	4-ethylphenylsulfate		6.055	↑	0.01218578
	catechol sulfate	Benzoate Metabolism	2.516	↑	0.01218578
	guaiacol sulfate		3.767	↑	0.01218578
Xenobiotics	hippurate		2.065	↑	0.01218578
	2,6-dihydroxybenzoic acid	Drug - Topical Agents	2.897	↑	0.01218578
	3-indoleglyoxylic acid		2.118	↑	0.01115943
	vanillic acid glycine	Food Component/Plant	5.884	↑	0.01115943

UNX: unilateral nephrectomy. Compared with control group, ↑ indicate that the relative content of the metabolite in UNX group is up-regulated, ↓ indicate that the relative content of the metabolite in UNX group is down-regulated.

Table S4. Metabolism Product change in Kidney of 1/6NX VS Control, related related to Figure 8B.

Super Meta Pathway	Metabolism Product	Sub Meta Pathway	Mean ratio	Up/Down Regulation	Raw P value	
Amino Acid	betaine aldehyde	Glycine, Serine and Threonine Metabolism	0.324	↓	0.01218578	
	N-acetylserine		0.55	↓	0.01218578	
	2-oxoarginine		Urea cycle; Arginine and Proline Metabolism	0.402	↓	0.02157175
	ornithine	1.319		↑	0.01218578	
		N-acetylvaline	Leucine, Isoleucine and Valine Metabolism	0.582	↓	0.01218578
		N-acetyltyrosine	Tyrosine Metabolism	0.506	↓	0.01218578
Carbohydrate	galactose 1-phosphate	Fructose, Mannose and Galactose Metabolism	2.221	↑	0.01218578	
	galactose 6-phosphate		2.652	↑	0.01218578	
	3-phosphoglycerate	Glycolysis, Gluconeogenesis, and Pyruvate Metabolism	2.367	↑	0.01218578	
	glucose		0.614	↓	0.01218578	
	3-phosphoglycerate		1.55	↑	0.01218578	
		phosphoenolpyruvate (PEP)		2.097	↑	0.01218578
		6-phosphogluconate	Pentose Phosphate Pathway	2.24	↑	0.01218578
		glucuronate 1-phosphate	Nucleotide Sugar	5.591	↑	0.01218578
		N-acetylglucosamine	Aminosugar Metabolism	3.743	↑	0.02157175
	6-phosphate					
Lipid	1-oleoyl-GPE (18:1)	Lysophospholipid	0.646	↓	0.01218578	
	1-palmitoyl-GPE (16:0)		0.673	↓	0.01218578	
	1-palmitoyl-GPI (16:0)		0.659	↓	0.01218578	
	1-stearoyl-GPE (18:0)		0.693	↓	0.01218578	

	phosphoethanolamine	Phospholipid Metabolism	1.532	↑	0.01218578
	2-hydroxylignocerate	Fatty Acid, Monohydroxy	1.973	↑	0.01218578
Nucleotide	2'-deoxyinosine	Purine Metabolism, (Hypo)Xanthine/Inosine containing	0.167	↓	0.01218578
	2'-deoxyguanosine	Purine Metabolism, Guanine containing	0.139	↓	0.01218578
	2'-O-methyluridine	Pyrimidine Metabolism, Cytidine containing	0.475	↓	0.02157175
	thymidine	Pyrimidine Metabolism, Thymine containing	0.185	↓	0.01218578
	uracil	Pyrimidine Metabolism, Uracil containing	0.761	↓	0.01218578
	2'-deoxyadenosine 5'-monophosphate	Purine Metabolism, Adenine containing	0.172	↓	0.01218578
Peptide	tyrosylglycine	Dipeptide	5.033	↑	0.01218578
	phenylalanylglycine		3.944	↑	0.01218578

1/6NX: 1/6 nephrectomy. Compared with control group, ↑ indicate that the relative content of the metabolite in UNX group is up-regulated, ↓ indicate that the relative content of the metabolite in UNX group is down-regulated.

Table S5. Metabolism Product change in Kidney of UUO VS Control, related related to Figure 8C.

Super Meta Pathway	Metabolism Product	Sub Meta Pathway	Mean ratio	Up/Down Regulation	Raw P value
Amino Acid	betaine aldehyde	Glycine, Serine and Threonine Metabolism	0.365	↓	0.01218578
	N,N,N-trimethyl-5-aminovalerate	Lysine Metabolism	3.406	↑	0.01218578
	N-acetylphenylalanine	Phenylalanine Metabolism	0.306	↓	0.01218578
	(N(1) + N(8))-acetylspermidine	Polyamine Metabolism	1.899	↑	0.01218578
	spermidine		1.899	↑	0.01218578
	oxindolylalanine	Tryptophan Metabolism	0.322	↓	0.01218578
	homoarginine	Urea cycle; Arginine and Proline Metabolism	0.328	↓	0.007494958
Carbohydrate	3-phosphoglycerate	Glycolysis, Gluconeogenesis, and Pyruvate Metabolism	2.409	↑	0.01218578
	glycerate		0.445	↓	0.01218578
	glucuronate 1-phosphate	Nucleotide Sugar	6.811	↑	0.01218578
	6-phosphogluconate	Pentose Phosphate Pathway	4.11	↑	0.01218578
	sedoheptulose-7-phosphate		2.505	↑	0.01218578
Lipid	ceramide (d18:1/14:0, d16:1/16:0)	Ceramides	0.197	↓	0.009700785
	N-palmitoylglycine	Fatty Acid Metabolism (Acyl Glycine)	0.23	↓	0.01218578
	2-aminooctanoate	Fatty Acid, Amino	0.461	↓	0.009700785
	glycerol	Glycerolipid Metabolism	0.491	↓	0.01218578
Nucleotide	(3'-5')-adenylyluridine	Dinucleotide	5.389	↑	0.01218578
	(3'-5')-uridylyluridine		4.704	↑	0.01218578
	xanthosine	Purine Metabolism,	0.532	↓	0.01218578

		(Hypo)Xanthine/Inosine containing			
	2'-deoxyadenosine 5'-monophosphate		0.145	↓	0.01218578
	2'-AMP	Purine Metabolism, Adenine containing	7.348	↑	0.01218578
	adenosine 3',5'-diphosphate		2.891	↑	0.01218578
	cytidine 2' or 3'-monophosphate (2' or 3'-CMP)	Pyrimidine Metabolism, Cytidine containing	2.411	↑	0.009700785
	2'-O-methyluridine		0.412	↓	0.01115943
	uridine 2'-monophosphate (2'-UMP)	Pyrimidine Metabolism, Uracil containing	4.587	↑	0.01115943
Cofactors and Vitamins	protoporphyrin IX	Hemoglobin and Porphyrin Metabolism	7.13	↑	0.01218578
Xenobiotics	daidzein sulfate (2)		10.106	↑	0.007494958
	vanillic acid glycine	Food Component/Plant	17.761	↑	0.01115943

UUO: unilateral ureteral obstruction. Compared with control group, ↑ indicate that the relative content of the metabolite in UNX group is up-regulated, ↓ indicate that the relative content of the metabolite in UNX group is down-regulated.