K^+ deficiency caused defects in renal tubular cell proliferation, oxidative stress response, tissue repair and tight junction integrity, but enhanced energy production, proteasome function and cellular K^+ uptake

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Supplementary Table S1: Compositions of ANK, ALK, and AKD in-house media.

Components	Concentration (g/L)		
	Normal K^+ (ANK) (K^+ = 5.3 mM)	**Low K^+ (ALK) (K^+ = 2.5 mM)**	**K^+ depleted (AKD) (K^+ = 0 mM)**
Inorganic salts			
Calcium chloride (anhydrate)	0.20000	0.20000	0.20000
Magnesium sulfate (anhydrate)	0.09767	0.09767	0.09767
Potassium chloride	0.40000	0.18868	0.00000
Sodium bicarbonate	1.50000	1.50000	1.50000
Sodium chloride	6.80000	6.80000	6.80000
Sodium Phosphate monobasic	0.14000	0.14000	0.14000
Amino acids			
Essential amino acid			
(M-5550, Sigma Chemical)			
L-Arginine.HCl	0.12664	0.12664	0.12664
L-Cystine.2HCl	0.03128	0.03128	0.03128
L-Glutamine	0.29200	0.29200	0.29200
L-Histidine.HCl.H_2O	0.04200	0.04200	0.04200
L-Isoleucine	0.05250	0.05250	0.05250
L-Leucine	0.05240	0.05240	0.05240
L-Lysine.HCl	0.07250	0.07250	0.07250
L-Methionine	0.01510	0.01510	0.01510
L-Phenylalanine	0.03300	0.03300	0.03300
L-threonine	0.04760	0.04760	0.04760
L-Tryptophan	0.01020	0.01020	0.01020
L-Tyrosine	0.05600	0.05600	0.05600
L-Valine	0.04680	0.04680	0.04680
Non-essential amino acids			
(M-7145, Sigma Chemical)			
L-Alanine	0.00890	0.00890	0.00890
L-Asparagine.H_2O	0.01500	0.01500	0.01500
L-Aspartic acid	0.01330	0.01330	0.01330
L-Glutamic acid	0.01470	0.01470	0.01470
L-Glycine	0.00750	0.00750	0.00750
L-Proline	0.01150	0.01150	0.01150
L-Serine	0.01050	0.01050	0.01050
Vitamins			
(M-6895, Sigma Chemical)			
D-Ca Pantothenic acid	0.00100	0.00100	0.00100
Choline chloride	0.00100	0.00100	0.00100
Folic acid	0.00100	0.00100	0.00100
i-Inositol	0.00200	0.00200	0.00200
Niacinamide	0.00100	0.00100	0.00100
Pyridoxal.HCl	0.00100	0.00100	0.00100
Riboflavin	0.00010	0.00010	0.00010
Thiamine.HCl	0.00100	0.00100	0.00100
Other components			
D-Glucose	1.00000	1.00000	1.00000
Phenol red	0.01000	0.01000	0.01000

Supplementary Table S2: Summary of the altered proteins involved in individual functional networks.

GO biological process	Symbol	Protein name	NCBI ID
Cell proliferation	*ARHGDIA*	Rho GDP dissociation inhibitor (GDI) alpha	gi|73964747
	CAPNS1	Calpain small subunit 1	gi|4502565
	CAT	Catalase	gi|194216584
	FGD4	FYVE, RhoGEF and PH domain-containing protein 4 (Actin filament-binding protein frabin) (FGD1-related F-actin-binding protein) (Zinc finger FYVE domain-containing protein 6)	gi|116241363
	GSTP1	Glutathione S-transferase P (GST 7-7) (Chain 7) (GST class-pi)	gi|73986963
	HSPB1	Heat shock protein 1, beta isoform 1 (Heat shock 25 kDa protein)	gi|73972966
	LGALS3	Lectin, galactose binding, soluble 3	gi|32363162
	LMNA	Prelamin-A/C isoform A	gi|162287370
	MAPK1	Mitogen-activated protein kinase 1-like	gi|291406910
	PRDX3	Thioredoxin-dependent peroxide reductase, mitochondrial precursor	gi|27806083
	PRKAG1	5-AMP-activated protein kinase, gamma-1 subunit (AMPK gamma-1 chain) (AMPKg) isoform 3	gi|73996585
	PRKDC	DNA-dependent protein kinase catalytic subunit	gi|255522855
	PSMA6	Proteasome subunit alpha type 6 (Proteasome iota chain) (Macropain iota chain) (Multicatalytic endopeptidase complex iota chain) isoform 2	gi|73962756
	PSMC2	Proteasome 26S ATPase subunit 2	gi|4506209
	YWHAE	Epsilon isoform of 14-3-3 protein	gi|149605465
Cell death	*ALB*	Serum albumin	gi|28592
	ARHGDIA	Rho GDP dissociation inhibitor (GDI) alpha	gi|73964747
	CAT	Catalase	gi|194216584
	EEF2	Elongation factor 2 (EF-2)	gi|291399590
	EIF5A	Eukaryotic translation initiation factor 5A-1-like	gi|297699875
	HBB	Beta-globin	gi|73982819
	HSP90AB1	Chaperone protein HSP90 beta	gi|9082289
	HSPB1	Heat shock protein 1, beta isoform 1 (Heat shock 25 kDa protein)	gi|73972966
	HSPE1	Chaperonin 10, cpn10	gi|73999070
	KRT8	Keratin, type II cytoskeletal 8 (Cytokeratin 8) (K8) (CK 8)	gi|73996455
	LMNA	Prelamin-A/C isoform A	gi|162287370
	MPO	Myeloperoxidase	gi|114669606
	P4HB	Prolyl 4-hydroxylase, beta subunit	gi|73964749
	PRDX3	Thioredoxin-dependent peroxide reductase, mitochondrial precursor	gi|74008772
	PRKDC	DNA-dependent protein kinase catalytic subunit	gi|255522855
	PSMA6	Proteasome subunit alpha type 6 (Proteasome iota chain) (Macropain iota chain) (Multicatalytic endopeptidase complex iota chain) isoform 2	gi|73962756
	PSMC2	Proteasome 26S ATPase subunit 2	gi|4506209
	YWHAE	Epsilon isoform of 14-3-3 protein	gi|149605465
Oxidative stress	*CAT*	Catalase	gi|194216584
	GSTP1	Glutathione S-transferase P (GST 7-7) (Chain 7) (GST class-pi)	gi|73986963
	HBB	Beta-globin	gi|73982819
	HSP90AB1	Chaperone protein HSP90 beta	gi|9082289
	MAPK1	Mitogen-activated protein kinase 1-like	gi|291406910
	MPO	Myeloperoxidase	gi|114669606

	PRDX1	Peroxiredoxin-1	gi|4505591
	PRDX3	Thioredoxin-dependent peroxide reductase, mitochondrial precursor	gi|74008772
	PRDX6	Peroxiredoxin-6	gi|3219774
	PRKAG1	5-AMP-activated protein kinase, gamma-1 subunit (AMPK gamma-1 chain) (AMPKg) isoform 3	gi|73996585
	PRKDC	DNA-dependent protein kinase catalytic subunit	gi|255522855
Tissue repair	*ATP1A1*	Sodium/potassium-transporting ATPase subunit alpha-1	gi|237681111
	CAPG	Macrophage capping protein (Actin-regulatory protein CAP-G)	gi|73980918
	CORO1B	Coronin, actin binding protein, 1B isoform 1	gi|73987435
	DNAH17	Dynein heavy chain 17, axonemal (Ciliary dynein heavy chain 17)	gi|57036583
	DNAH6	Dynein, axonemal, heavy chain 6 (Cytoplasm, cytoskeleton, cilium axoneme)	gi|293346874
	DNAH9	Dynein, axonemal, heavy polypeptide 9 isoform 2	gi|109491006
	EZR	Ezrin	gi|50881
	HSP90AB1	Chaperone protein HSP90 beta	gi|9082289
	HSPB1	Heat shock protein 1, beta isoform 1 (Heat shock 25 kDa protein)	gi|73972966
	KIF14	Kinesin family member 14	gi|291402681
	LMNA	Prelamin-A/C isoform A	gi|162287370
	MAPK1	Mitogen-activated protein kinase 1-like	gi|291406910
	PLAT	Tissue-type plasminogen activator-like	gi|334312618
	PPIA	Peptidylprolyl isomerase A (cyclophilin A)	gi|303227965
	YWHAE	Epsilon isoform of 14-3-3 protein	gi|149605465
Cell integrity	*ACAA2*	3-ketoacyl-CoA thiolase, mitochondrial	gi|74222010
	ADSL	Adenylosuccinate lyase isoform 1	gi|73969028
	ALDH5A1	Succinate-semialdehyde dehydrogenase	gi|262042869
	ARHGDIA	Rho GDP dissociation inhibitor (GDI) alpha	gi|73964747
	ATP1A1	Sodium/potassium-transporting ATPase subunit alpha-1	gi|237681111
	CAPNS1	Calpain small subunit 1	gi|4502565
	CAT	Catalase	gi|194216584
	CCT2	Chaperonin containing TCP1, subunit 2 isoform 1	gi|73968673
	CORO1B	Coronin, actin binding protein, 1B isoform 1	gi|73987435
	DNAH17	Dynein heavy chain 17, axonemal (Ciliary dynein heavy chain 17)	gi|194216584
	DNAH6	Dynein, axonemal, heavy chain 6	gi|293346874
	DNAH9	Dynein, axonemal, heavy polypeptide 9 isoform 2	gi|109491006
	EIF3I	Eukaryotic translation initiation factor 3 subunit 2 (eIF-3 beta) (eIF3 p36) (eIF3i) (TGF-beta receptor interacting protein 1) (TRIP-1)	gi|163140875
	EIF3K	Eukaryotic translation initiation factor 3, subunit 12 isoform 1	gi|60360400
	FGD4	Synaptotagmin-like 3 (Exophilin-6)	gi|297467751
	GLS	Glutaminase C isoform 3	gi|114582297
	HBB	Beta-globin	gi|73982819
	HSP90AB1	Chaperone protein HSP90 beta	gi|9082289
	KRT8	Keratin, type II cytoskeletal 8 (Cytokeratin 8) (K8) (CK 8)	gi|73996455
	LGALS3	Lectin, galactose binding, soluble 3	gi|32363162
	LMNA	Prelamin-A/C isoform A	gi|162287370
	MAPK1	Mitogen-activated protein kinase 1-like	gi|291406910
	MMP13	collagenase 3 preproprotein (Matrix metalloproteinase 13 preproprotein)	gi|4505209
	OAT	Ornithine aminotransferase, mitochondrial precursor	gi|73998800

		(Ornithine--oxo-acid aminotransferase) isoform 1	
	P4HB	Prolyl 4-hydroxylase, beta subunit	gi|73964749
	PLEC	Plectin 1 isoform 1 isoform 1	gi|73974726
	PPIA	Peptidylprolyl isomerase A (cyclophilin A) [Bos taurus]	gi|303227965
	PRDX3	Thioredoxin-dependent peroxide reductase, mitochondrial precursor	gi|74008772
	PRKAG1	5-AMP-activated protein kinase, gamma-1 subunit (AMPK gamma-1 chain) (AMPKg) isoform 3	gi|73996585
	PRKDC	DNA-dependent protein kinase catalytic subunit	gi|255522855
	RPS12	40S ribosomal protein S12	gi|14277700
	TWF1	Twinfilin isoform 1 isoform 1	gi|149605465
	YWHAE	Epsilon isoform of 14-3-3 protein	gi|149605465
ATP production	*AK2*	Adenylate kinase 2 isoform b isoform 2	gi|73949913
	ALDH5A1	Succinate-semialdehyde dehydrogenase	gi|262042869
	ATP5H	ATP synthase subunit d, mitochondrial-like	gi|57108097
	DNAH17	Dynein heavy chain 17, axonemal (Ciliary dynein heavy chain 17)	gi|57036583
	DNAH6	Dynein, axonemal, heavy chain 6	gi|293346874
	DNAH9	Dynein, axonemal, heavy polypeptide 9 isoform 2	gi|109491006
	ENO1	Alpha enolase (2-phospho-D-glycerate hydro-lyase)(NNE)(Enolase 1) (Phosphopyruvate hydratase)	gi|73953207
	IDH3A	NAD+-isocitrate dehydrogenase, alpha subunit	gi|73994237
	NDUFA10	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 10, 42kDa precursor	gi|297301779 (gi|163140875)
	PGAM1	Phosphoglycerate mutase 1 (Phosphoglycerate mutase isozyme B) (PGAM-B) (BPG-dependent PGAM 1) isoform 1	gi|114632195
	PSMC2	26S protease regulatory subunit 7	gi|4506209
	TPI1	Triosephosphate isomerase	gi|308082020
	UQCRC1	Ubiquinol-cytochrome c reductase core protein I isoform 2	gi|73985642
Proteasome function	*PSMA6*	Proteasome subunit alpha type 6 (Proteasome iota chain) (Macropain iota chain) (Multicatalytic endopeptidase complex iota chain) isoform 2	gi|73962756
	PSMC2	Proteasome 26S ATPase subunit 2	gi|4506209
Ion transport	*ALB*	Serum albumin	gi|28592
	ATP1A1	Sodium/potassium-transporting ATPase subunit alpha-1	gi|237681111
	GLS	Glutaminase C isoform 3	gi|114582297
	HBB	Beta-globin	gi|73982819
	HSP90AB1	Chaperone protein HSP90 beta	gi|9082289
	MAPK1	Mitogen-activated protein kinase 1-like	gi|291406910
	PPIA	Peptidylprolyl isomerase A (cyclophilin A) [Bos taurus]	gi|28189246
	PRDX1	Peroxiredoxin-1	gi|4505591
	UQCRC1	Ubiquinol-cytochrome c reductase core protein I isoform 2	gi|73985642
	YWHAE	Epsilon isoform of 14-3-3 protein	gi|149605465