Table S1. OPLS–DA coefficients derived from the NMR data of plasma metabolites obtained from the (A) diquat, (B) arginine+diquat, (C) N-carbamylglutamate+diquat groups

| Metabolite | OPLS-DA coefficient (r)[a] | | | P value[b] | | |
|---|---|---|---|---|---|---|
| | B (vs A) | C (vs A) | C (vs B) | B (vs A) | C (vs A) | C (vs B) |
| 3,4-Dihydroxymandelate (72) | – | –0.634 | – | >0.05 | <0.05 | >0.05 |
| 1-Methylhistidine (73) | – | – | 0.674 | >0.05 | >0.05 | <0.05 |
| 3-Hydroxybutyrate (57) | – | 0.632 | – | >0.05 | <0.05 | >0.05 |
| 3-Methylhistidine (75) | – | 0.618 | 0.652 | >0.05 | <0.05 | <0.05 |
| Acetamide (13) | –0.758 | – | 0.839 | <0.05 | >0.05 | <0.05 |
| Acetoacetate (16) | – | – | 0.771 | >0.05 | >0.05 | <0.05 |
| Acetone (15) | – | 0.672 | 0.732 | >0.05 | <0.05 | <0.05 |
| Alanine (10) | –0.640 | – | – | <0.05 | >0.05 | >0.05 |
| Allantoin (41) | – | 0.712 | 0.714 | >0.05 | <0.05 | <0.05 |
| Asparagine (65) | – | 0.741 | 0.756 | >0.05 | <0.05 | <0.05 |
| Citrate (20) | – | 0.766 | 0.616 | >0.05 | <0.05 | <0.05 |
| Glutamate (62) | – | – | 0.763 | >0.05 | >0.05 | <0.05 |
| Glycerolphosphocholine (66) | – | – | –0.619 | >0.05 | >0.05 | <0.05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Isobutyrate (5) | – | – | 0.686 | >0.05 | >0.05 | <0.05 |
| LDL (52) | – | –0.788 | – | >0.05 | <0.05 | >0.05 |
| Lipid (58) | – | –0.802 | 0.704 | >0.05 | <0.05 | <0.05 |
| Lysine (59) | –0.662 | –0.631 | –0.656 | <0.05 | <0.05 | <0.05 |
| Phenylalanine (74) | – | 0.654 | 0.666 | >0.05 | <0.05 | <0.05 |
| Pyruvate (17) | –0.650 | – | – | <0.05 | >0.05 | >0.05 |
| Threonine (69) | – | –0.772 | – | >0.05 | <0.05 | >0.05 |
| TMAO (33) | – | 0.786 | – | >0.05 | <0.05 | >0.05 |
| Tyrosine (71) | –0.645 | 0.622 | – | <0.05 | <0.05 | >0.05 |
| Unsaturated lipid (70) | – | –0.764 | – | >0.05 | <0.05 | >0.05 |
| Urea (42) | – | –0.628 | – | >0.05 | <0.05 | >0.05 |
| VLDL (53) | – | –0.852 | – | >0.05 | <0.05 | >0.05 |
| α-Glucose (40) | –0.699 | – | –0.708 | <0.05 | >0.05 | <0.05 |
| β-Glucose (39) | –0.748 | – | –0.775 | <0.05 | >0.05 | <0.05 |

[a]Correlation coefficients: positive and negative signs show positive and negative correlation in the concentrations, respectively. The correlation coefficient of $|r| > 0.602$ was used as the cutoff value. ‘‘–’’ means the correlation coefficient $|r|$ is less than 0.602. [b]Normalized integral of metabolites in the spectrum (normalized to 100). Integrals of the altered metabolites were analyzed statistically using one-

way analysis of variance (ANOVA) of SPSS 16.0 software (SPSS Inc., Chicago, IL, USA). Data sets were further analyzed using post hoc tests (least significant difference, LSD) for multiple comparisons to determine the statistical differences between groups. P values are significant at the $<0.05$ level, and P values are not significant at $>0.05$.

Table S2. OPLS–DA coefficients derived from the NMR data of urine metabolites obtained from the (A) control, (B) diquat, (C) arginine+diquat, (D) N-carbamylglutamate+diquat groups

| Metabolite | OPLS-DA coefficient (r)[a] | | | | P value [b] | | | |
|---|---|---|---|---|---|---|---|---|
| | B (vs A) | C (vs B) | D (vs B) | D(vs C) | B (vs A) | C (vs B) | D (vs B) | D (vs C) |
| 4-Aminohippurate (48) | 0.904 | – | – | 0.742 | <0.05 | >0.05 | >0.05 | <0.05 |
| acetamide (13) | 0.614 | –0.747 | –0.740 | 0.809 | <0.05 | <0.05 | <0.05 | <0.05 |
| acetate (12) | –0.727 | – | –0.760 | –0.761 | <0.05 | >0.05 | <0.05 | <0.05 |
| acetoacetate (16) | 0.784 | – | – | 0.654 | <0.05 | >0.05 | >0.05 | <0.05 |
| acetone (15) | – | – | –0.782 | –0.714 | >0.05 | >0.05 | <0.05 | <0.05 |
| alanine (10) | 0.648 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| allantoin (41) | –0.658 | – | 0.608 | – | <0.05 | >0.05 | <0.05 | >0.05 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| benzoate (49) | 0.805 | – | –0.659 | – | <0.05 | >0.05 | <0.05 | >0.05 |
| bile acids (1) | –0.842 | 0.626 | 0.78 | 0.711 | <0.05 | <0.05 | <0.05 | <0.05 |
| citrate (20) | –0.688 | 0.765 | 0.733 | – | <0.05 | <0.05 | <0.05 | >0.05 |
| citrulline (11) | 0.727 | –0.825 | –0.776 | 0.753 | <0.05 | <0.05 | <0.05 | <0.05 |
| creatine (26) | –0.756 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| creatinine (27) | 0.78 | 0.613 | – | – | <0.05 | <0.05 | >0.05 | >0.05 |
| dimethylamine (22) | 0.945 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| ethanol (6) | 0.675 | –0.869 | –0.659 | 0.906 | <0.05 | <0.05 | <0.05 | <0.05 |
| ethanolamine (29) | 0.793 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| formate (51) | 0.765 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| glycine (34) | –0.666 | –0.608 | – | –0.639 | <0.05 | <0.05 | >0.05 | <0.05 |
| hippurate (37) | 0.939 | – | –0.745 | –0.829 | <0.05 | >0.05 | <0.05 | <0.05 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| homogentisate (43) | 0.844 | 0.668 | 0.644 | 0.639 | <0.05 | <0.05 | <0.05 | <0.05 |
| indoxyl sulfate (46) | 0.873 | – | – | 0.666 | <0.05 | >0.05 | >0.05 | <0.05 |
| isobutyrate (5) | – | –0.771 | – | 0.743 | >0.05 | <0.05 | >0.05 | <0.05 |
| lactate (9) | 0.648 | –0.619 | –0.690 | 0.626 | <0.05 | <0.05 | <0.05 | <0.05 |
| malonate (30) | 0.71 | –0.802 | – | – | <0.05 | <0.05 | >0.05 | >0.05 |
| methylamine (21) | 0.893 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| methylguanidine (23) | 0.809 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| methymalonate (7) | 0.668 | –0.843 | – | 0.885 | <0.05 | <0.05 | >0.05 | <0.05 |
| m-hydroxyphenylacetate (45) | 0.86 | – | – | 0.761 | <0.05 | >0.05 | >0.05 | <0.05 |
| N-acetylglutamate (14) | 0.755 | –0.650 | –0.893 | –0.858 | <0.05 | <0.05 | <0.05 | <0.05 |
| nicotinamide (47) | 0.753 | – | –0.615 | –0.654 | <0.05 | >0.05 | <0.05 | <0.05 |
| N-methylnicotinamide (38) | –0.814 | –0.647 | – | – | <0.05 | <0.05 | >0.05 | >0.05 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ornithine (28) | –0.611 | – | –0.655 | – | <0.05 | >0.05 | <0.05 | >0.05 |
| phenylacetyglycine (36) | 0.925 | – | 0.625 | 0.618 | <0.05 | >0.05 | <0.05 | <0.05 |
| propionate (4) | –0.692 | –0.794 | – | 0.929 | <0.05 | <0.05 | >0.05 | <0.05 |
| sarcosine (35) | 0.683 | –0.609 | – | 0.756 | <0.05 | <0.05 | >0.05 | <0.05 |
| succinate (18) | –0.777 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| trigonelline (50) | 0.917 | – | –0.663 | – | <0.05 | >0.05 | <0.05 | >0.05 |
| α-hydroxybutyrate (3) | –0.666 | – | – | – | <0.05 | >0.05 | >0.05 | >0.05 |
| α-hydroxy-iso-valerate (2) | – | – | 0.738 | 0.602 | >0.05 | >0.05 | <0.05 | <0.05 |
| α-ketoglutarate (19) | –0.818 | 0.75 | 0.678 | – | <0.05 | <0.05 | <0.05 | >0.05 |
| β-glucose (39) | – | –0.620 | 0.645 | 0.667 | >0.05 | <0.05 | <0.05 | <0.05 |

[a]Correlation coefficients: positive and negative signs show positive and negative correlation in the concentrations, respectively. The correlation coefficient of $|r|>0.602$ was used as the cutoff value. ‘‘–’’ means the correlation coefficient $|r|$ is less than 0.602. [b]Normalized integral of metabolites in the spectrum (normalized to 100). Integrals of the altered

metabolites were analyzed statistically using one-way analysis of variance (ANOVA) of SPSS 16.0 software (SPSS Inc., Chicago, IL, USA). Data sets were further analyzed using post hoc tests (least significant difference, LSD) for multiple comparisons to determine the statistical differences between groups. P values are significant at the $<0.05$ level, and P values are not significant at $>0.05$.