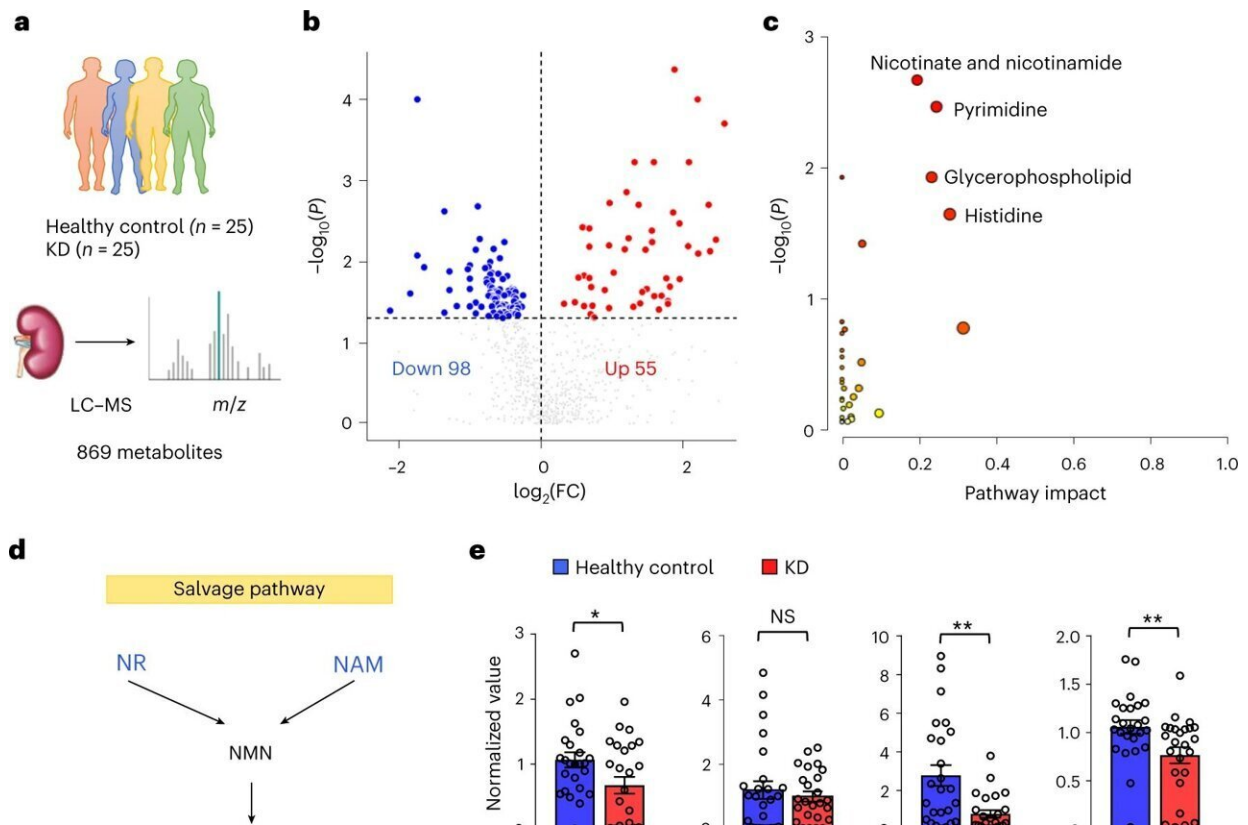


Scientists uncover protective role of NAD maintenance in kidney disease

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Integrated metabolomics and transcriptomics data analysis of human kidney samples. **a**, Total of 50 human kidney samples were collected for metabolomics analysis; including healthy controls ($n = 25$) and patients with KD ($n = 25$). **b**, Volcano plot of metabolites showing significant changes in human diseased kidneys. The x axis shows \log_2 fold change ($\log_2\text{FC}$). The y axis shows $-\log_{10}(P)$ value). Color indicates metabolites significantly higher (red) or lower (blue) in human diseased kidneys. Welch's two-sided t -test was used to calculate P value. **c**, Metabolic pathways showing significant changes in diseased kidneys. The dot

color indicates the level of significance, the dot size indicates pathway impact. *P* value was calculated from the enrichment analysis in MetaboAnalyst. **d**, The simplified NAD salvage pathway. Blue indicates metabolites significantly lower in human diseased kidneys. **e**, The levels of NAD⁺, NMN, NR and NAM in human kidneys (healthy control *n* = 25 and KD *n* = 25). **P*

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