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Clocking salt levels in the blood: A link between the circadian rhythm and salt balance

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New research, conducted by Charles Wingo and his colleagues, at the University of Florida, Gainsville, suggests a link between the circadian rhythm and control of sodium (salt) levels in mice.

The hormone aldosterone regulates levels of sodium in the blood and thereby helps control blood pressure. Although it is known that aldosterone regulates sodium levels by controlling expression of the alpha-subunit of the epithelial sodium channel (alpha-ENaC) in the kidney, the molecular pathway by which aldosterone modulates alpha-ENaC levels has not been determined.

In a previous study to address this issue, Wingo and colleagues found that aldosterone induced expression of the circadian clock gene Per1 in mouse cells, but the effects of this induction were not investigated. In this new study, they have revealed that the protein produced from the Per1 gene (Period 1) regulates expression of alpha-ENaC in the mouse kidney. Importantly, in the absence of Period 1, expression of alpha-ENaC in the mouse kidney was decreased and sodium loss in the urine was increased.

Since expression from the Per1 gene seemed to follow a circadian pattern, the authors suggest that the circadian clock has a role in balancing sodium levels in the body.

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More information: www.the-jci.org/article.php?id=36908

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