



Letter

Vinegar could act by gut microbiome

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To the Editor,

In their recent paper, Zhu et al. demonstrated that dietary vinegar could prevent kidney stone formation via an epigenetic mechanism [1]. While we agree that vinegar must execute its effect by increasing urinary citrate and decreasing calcium excretion, it should be noted that the metabolism of acetate in the circulation and in the kidney is rather rapid, as demonstrated by the mean transit time of ¹³C-acetate of 26 ± 8.1 s after intravenous injection *in vivo* [2]. Therefore, there could be another mechanism and we hypothesize that vinegar consumption may cause the alteration of gut-kidney axis or the gut microbiome could also contribute to the kidney stone prevention effect *in vivo*. Shanxi aged vinegar is produced through solid-state fermentation, which produces a rich microbiome and numerous bioactive materials besides acetate. Emerging evidence have shown that renal stone formers have a unique gut microbiome and changing gut microbiome could lower stone recurrence [3]. It has been suggested that people living in Shanxi Province, who consume lot of Shanxi aged vinegar as summarized by Zhu et al. [1], may have a unique profile of gut microbiome [4]. During the final stage of Shanxi aged vinegar making, which is years of air dehydration, concentrations of most organic acids in semi-finished vinegar increase due to the condensation, while oxalic acid increases at a much slower rate [5], implying the semi-finished vinegar's

capability of oxalate degradation with its fermentation microbiome. Chronic consumption of Shanxi aged vinegar could probably lead to a shift of the gut microbiome towards oxalate degradation and thus less intestinal oxalate absorption. We suggest that it's worthwhile to investigate the effect of vinegar consumption on the gut microbiome and consequently on renal stone formation.

Declaration of Competing Interest

Mrs. Luo and Dr. Xu have nothing to disclose.

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