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The effects of periostin on the lipid metabolism in the aged kidney

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Objectives: Periostin plays a crucial role in fibrosis, which is an important mechanism of kidney aging. Changes in lipid metabolism due to aging are known. In this study, we investigated the effect of periostin on lipid metabolism in kidney aging.

Methods: Wild type (WT) C57BL/6 mice and *Postn null* (*Postn*^{-/-}) mice aged 24 months were used. We analyzed lipids with liquid chromatography-tandem mass spectrometry (LC-MS/MS) to systematically study the lipidome that changes as the aging process progresses. After sample preparation, total lipid was extracted, and lipid identification and selection were performed by LC-MS/MS analysis. Lipid quantification was also performed in each sample with multiple reaction monitoring-MS (MRM-MS).

Results: Serum creatinine levels were higher and tubular atrophy/interstitial fibrosis was prominent in the aged WT mice than in the aged *Postn null* mice. Through quantitative lipidomic profiling in LC-MRM-MS, 35 differentially regulated lipids were observed among a total of 430 quantified lipids. Phosphatidylcholines, triacylglycerol, cholesteryl ester and cholesterol were significantly higher in aged WT mice than in aged *Postn null* mice. Especially, linoleic acid, linolenic acid, arachidonic acid, and docosahexaenoic acid as PUFA in cholesteryl ester showed a large difference in expression amount between aged WT mice and aged *Postn null* mice. Although ceramide did not show any difference in the expression level of the two groups, ceramide-1-phosphate showed an increased expression level in aged WT mice and decreased in aged *Postn null* mice. In contrast, sphingomyelin, dehydrosphingomyelin, monoacylglycerol did not differ between the two groups.

Conclusions: In this study, we found that the changes of lipid metabolism significantly with the expression of periostin in aged kidneys. Further studies of specific mechanisms will be needed.