

Omega 3 attenuate renal injury in UUO mice via improving autophagy flux.

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INTRODUCTION:

It has been known that unilateral ureteral obstruction (UUO) induces autophagic activation in obstructed kidney. Inhibition of autophagy aggravates renal injury in UUO mice. Recently, it is reported that Omega 3 fatty acid regulate the autophagy. we evaluated whether ω 3-PUFA may attenuate renal fibrosis in UUO mice, and evaluated associating mechanism.

METHODS:

10-week-old male C57Bl/6 mice were divided into 4 groups; sham, Omega 3 + sham, vehicle (normal saline, same volume to Omega 3 + UUO, Omega 3 + UUO. Omega 3 and vehicle were administered orally using an NG tube (Omega 3 100mg/kg/day) from pre-operation day to 7 days after operation. Mice were sacrificed at 7 days after surgery and kidney tissue were collected. Real time RT-PCR, western blot and immunohistochemistry for molecular study and H&E stain and PAS stain for histologic examination were performed.

RESULTS :

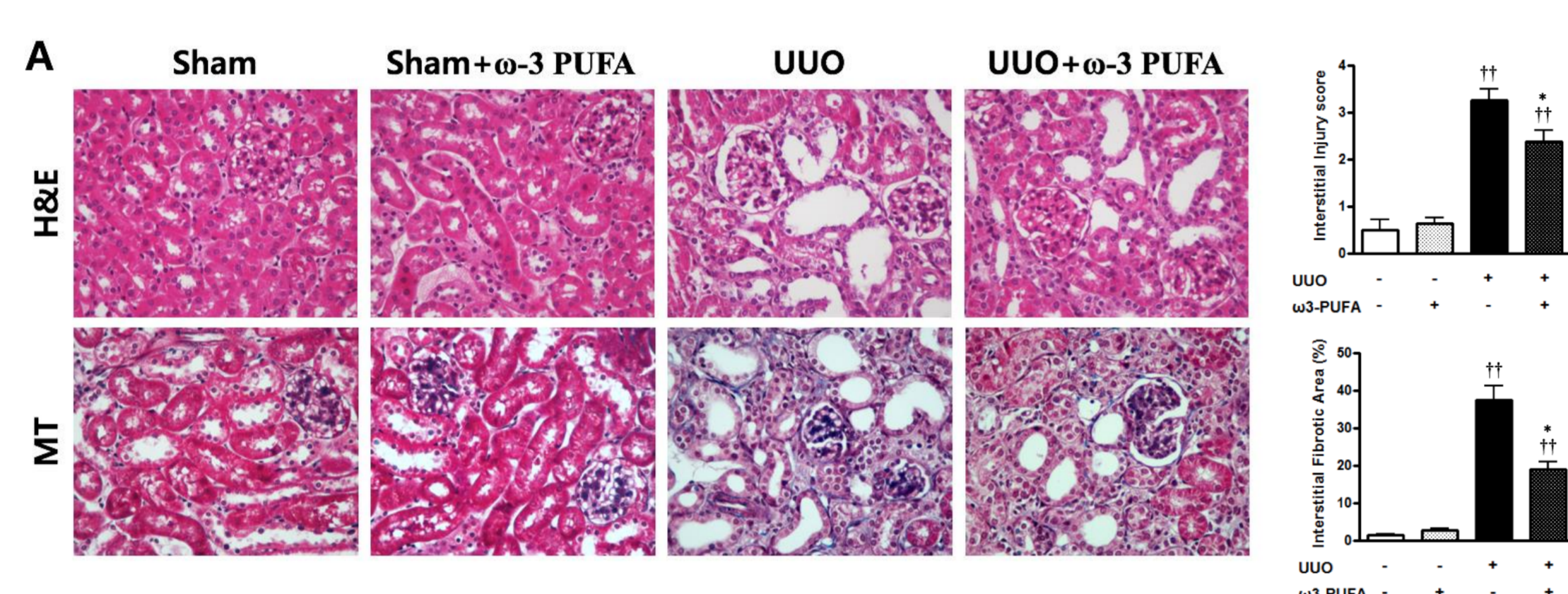
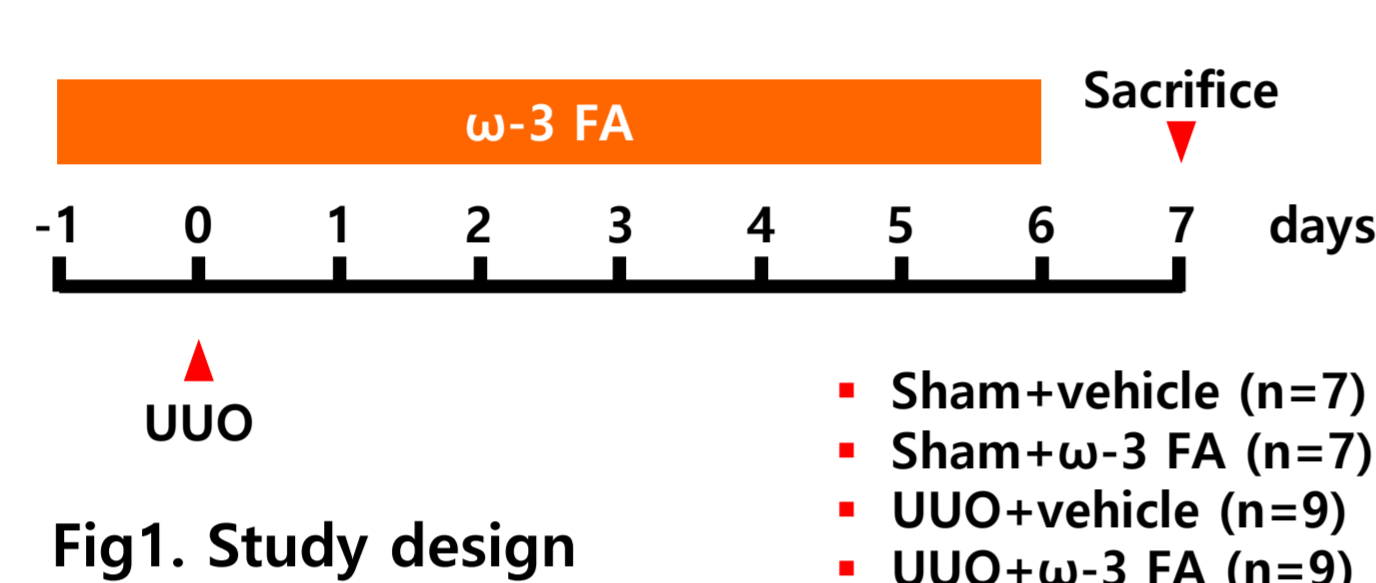


Figure 2 The effects of Omega 3 on UUO injury. Omega 3 decreased renal tubular injury (tubular necrosis, inflammation, detachment) in UUO mice. Omega 3 decreased renal fibrosis in UUO mice.

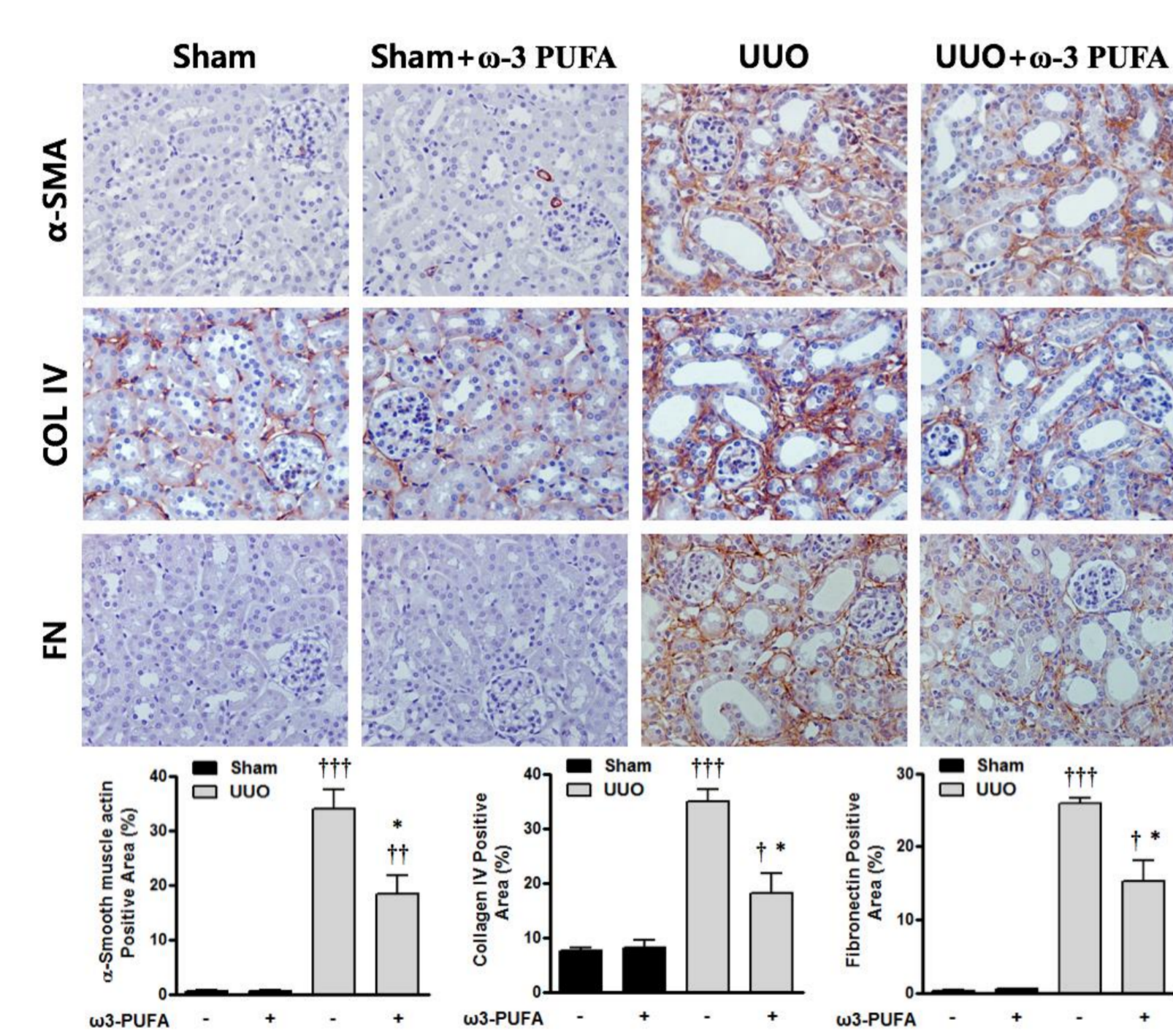


Figure 3 Omega 3 decreased renal fibrosis marker alpha SMA, collagen IV, fibronectin) in UUO mice.

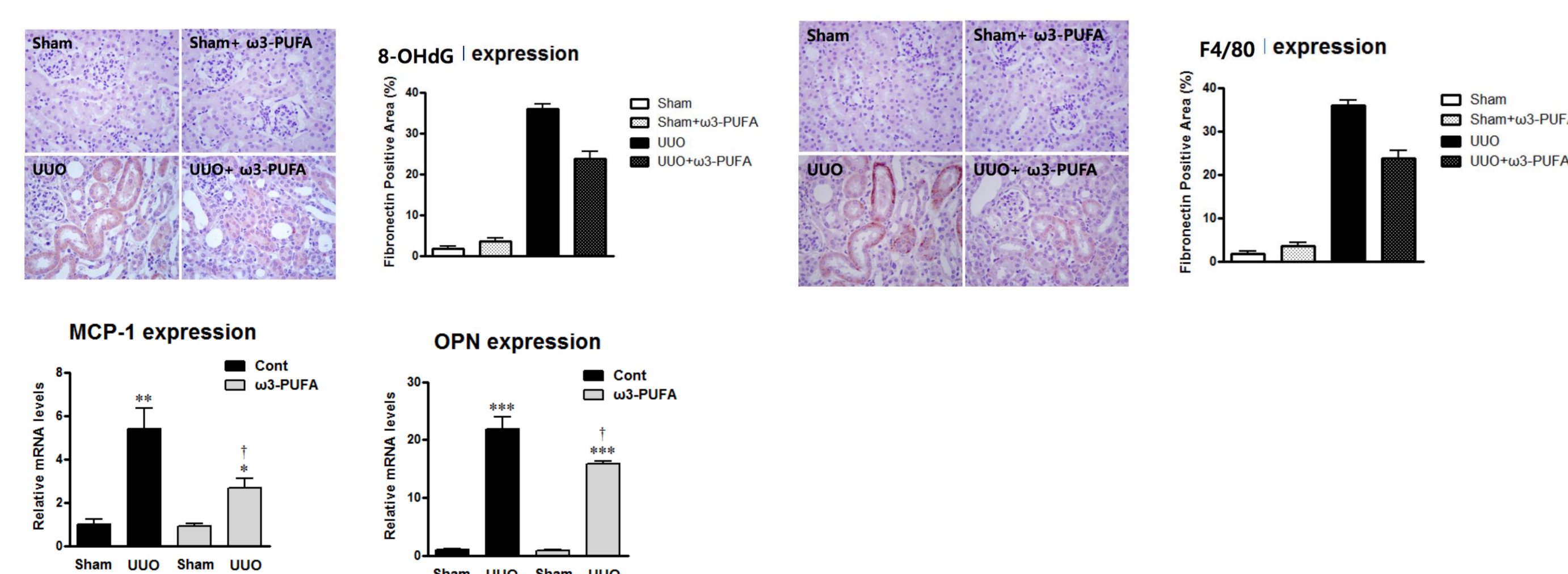


Figure 4 Omega 3 decreased 8-OHDG in UUO mice. Omega 3 decreased macrophage infiltration in UUO mice. Also Omega 3 decreased renal mRNA expression of MCP-1 and osteopontin in UUO mice.

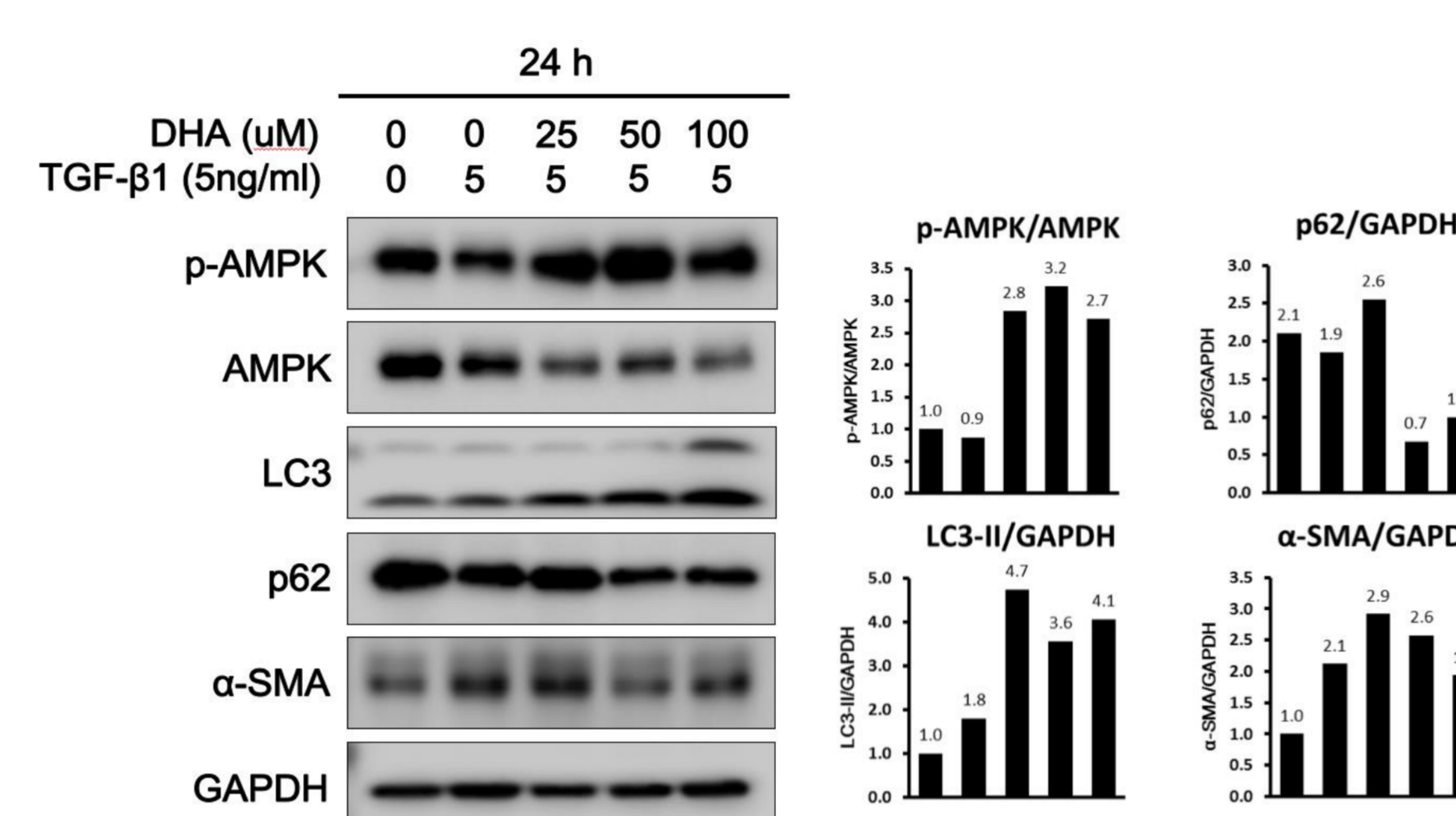


Figure 5 DHA improved autophagy flux in TGF beta treated HK-2 cells. TGF-beta treatment increased the alpha SMA. DHA treatment increased dose dependently, pAMPK, LC3, and decreased alpha SMA, p62.

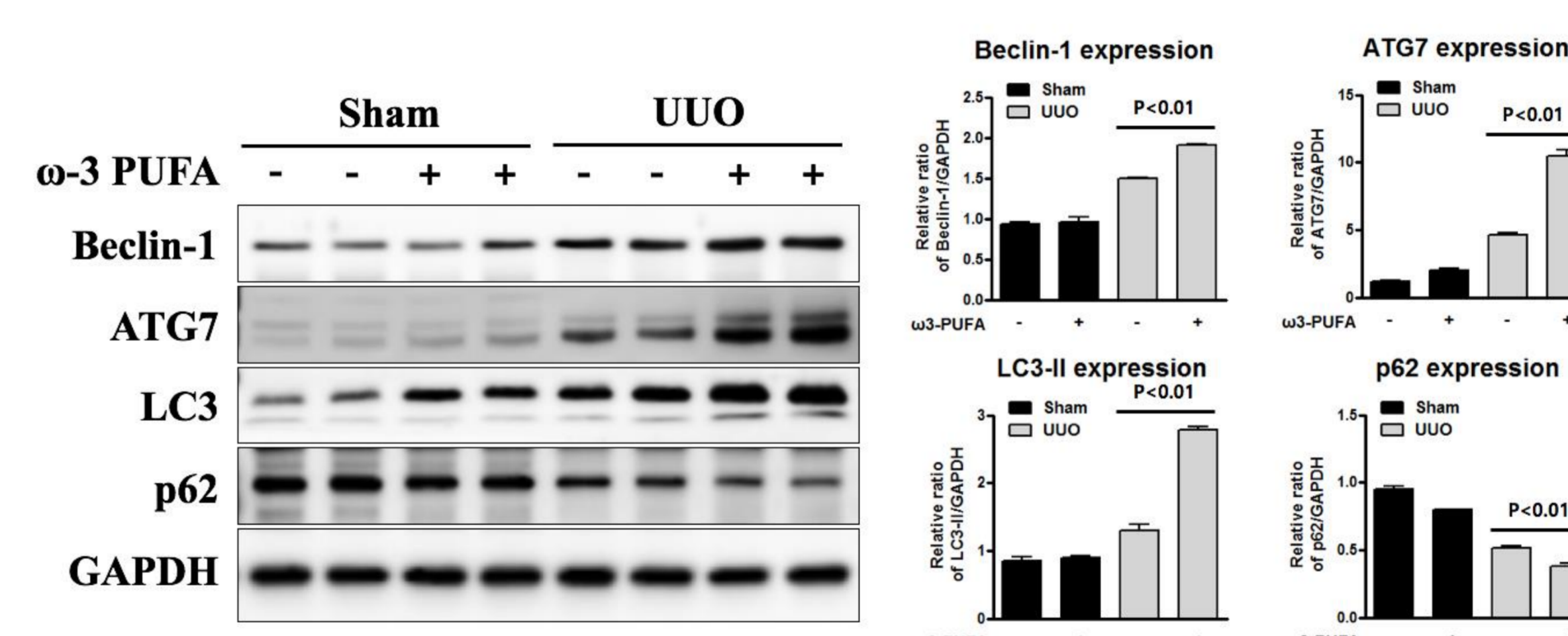


Figure 6 omega 3 treatment improved autophagy flux in UUO mice. Omega 3 treatment increased pAMPK, LC3, however, it decreased alpha SMA, p62.

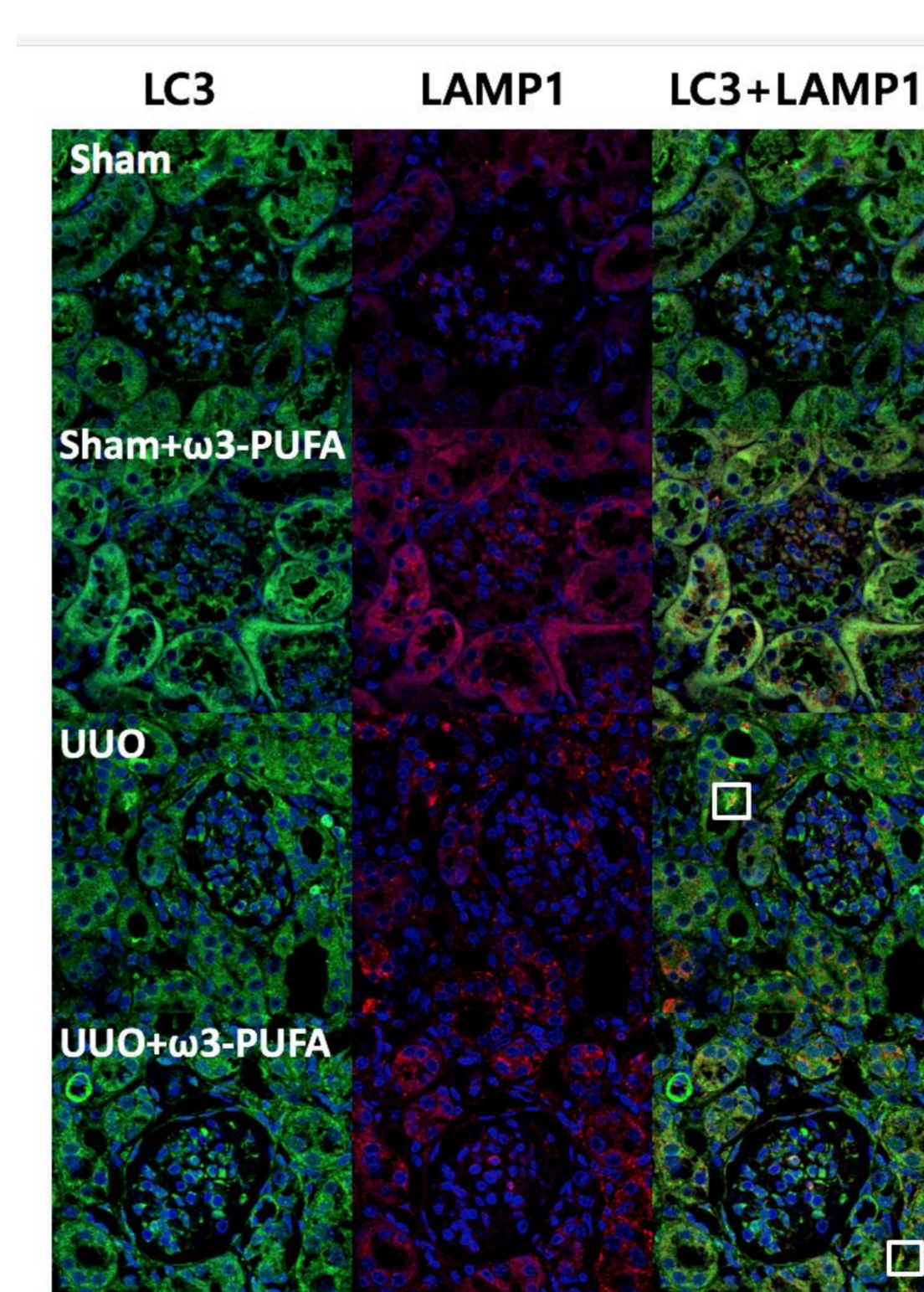


Figure 6 The representative picture of LC3 and LAMP1 immunostain. Omega 3 treatment increased the LC3 with LAMP1 co stained area.

CONCLUSION :

Omega 3 fatty acid ameliorate renal fibrosis in UUO kidney via enhancement of autophagy flux.