

1 **Fucoidans from *Cucumaria frondosa* ameliorates renal interstitial fibrosis via**  
2 **inhibition of PI3K/Akt/NF- $\kappa$ B signaling pathway**

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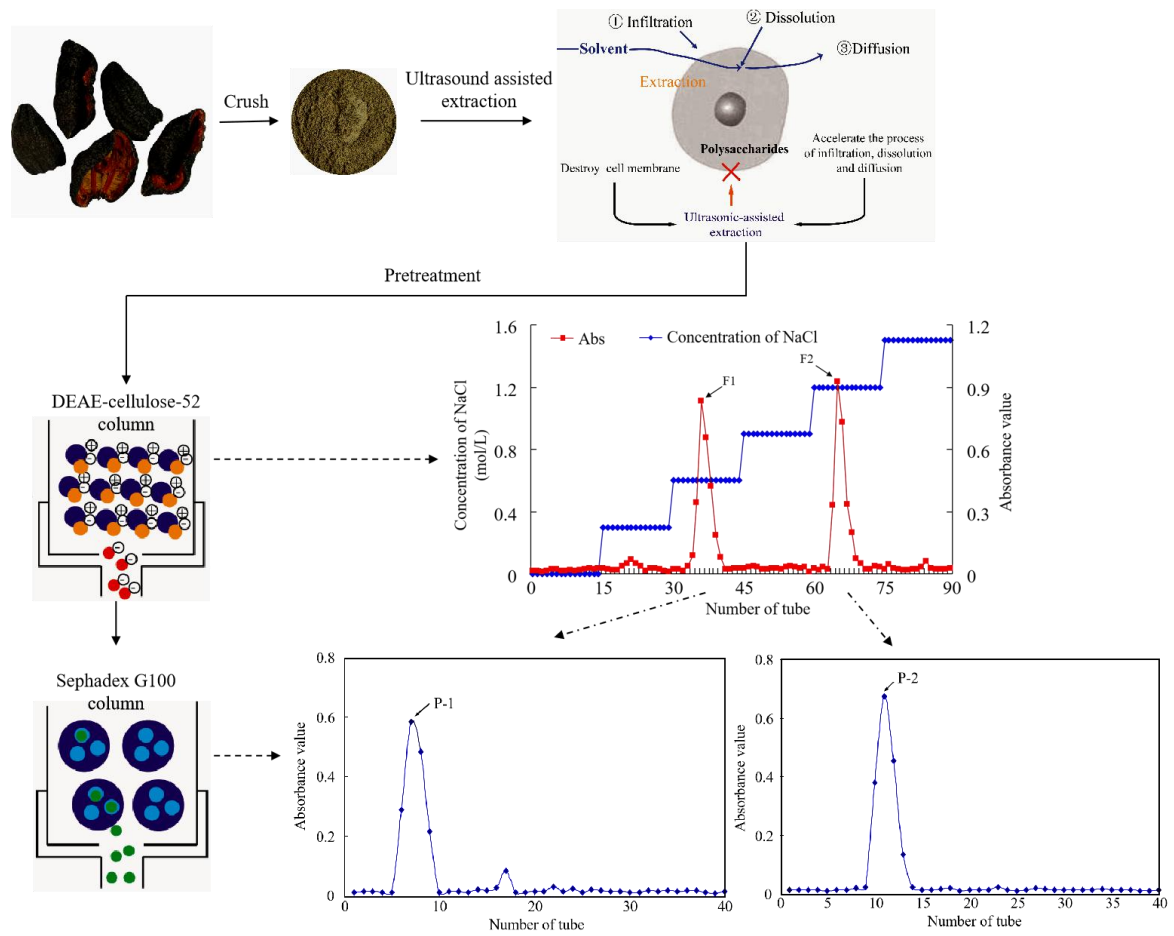
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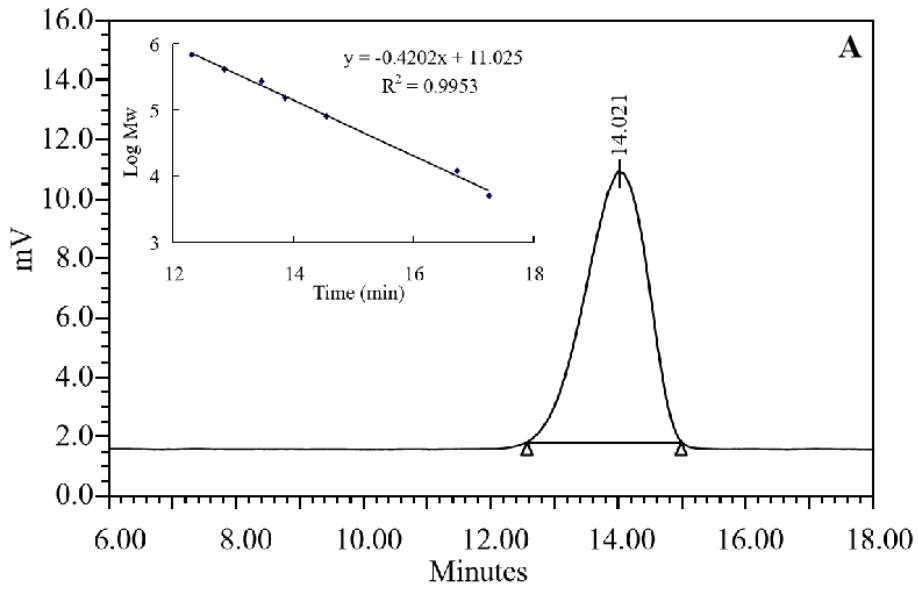
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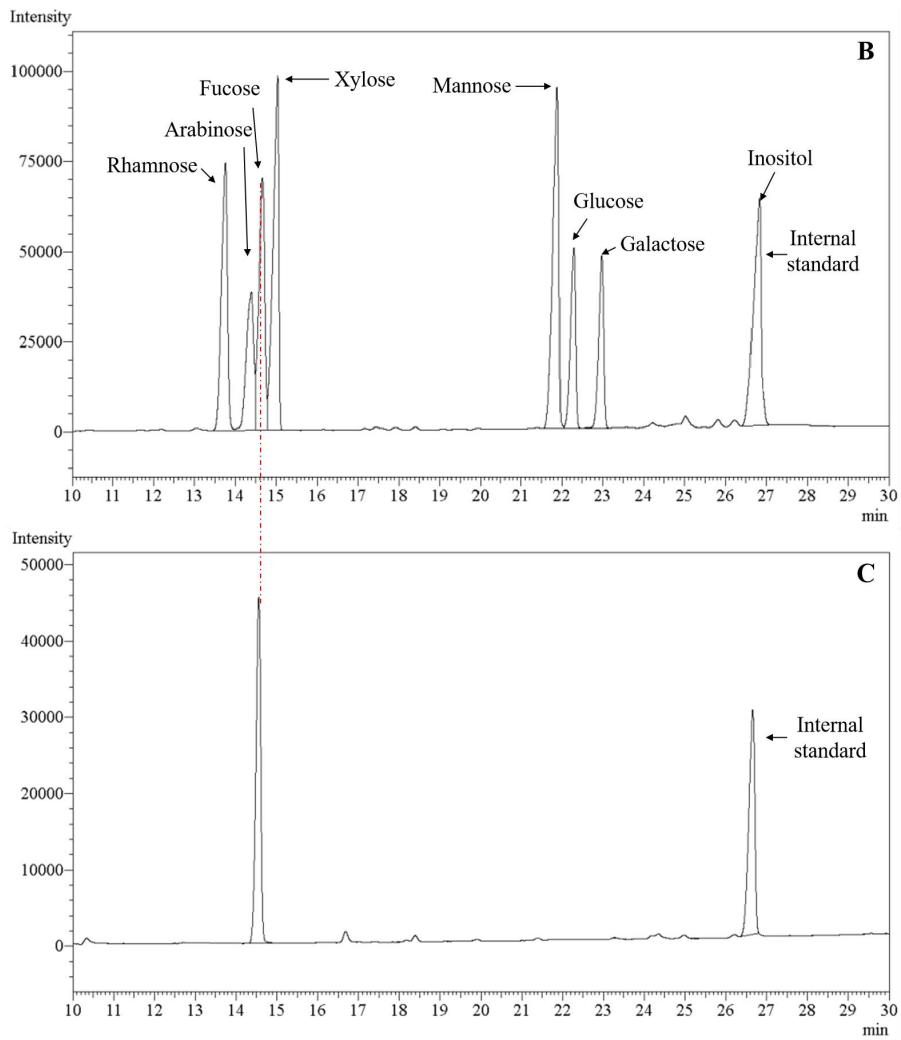
<sup>1</sup> These authors contributed equally to this paper.



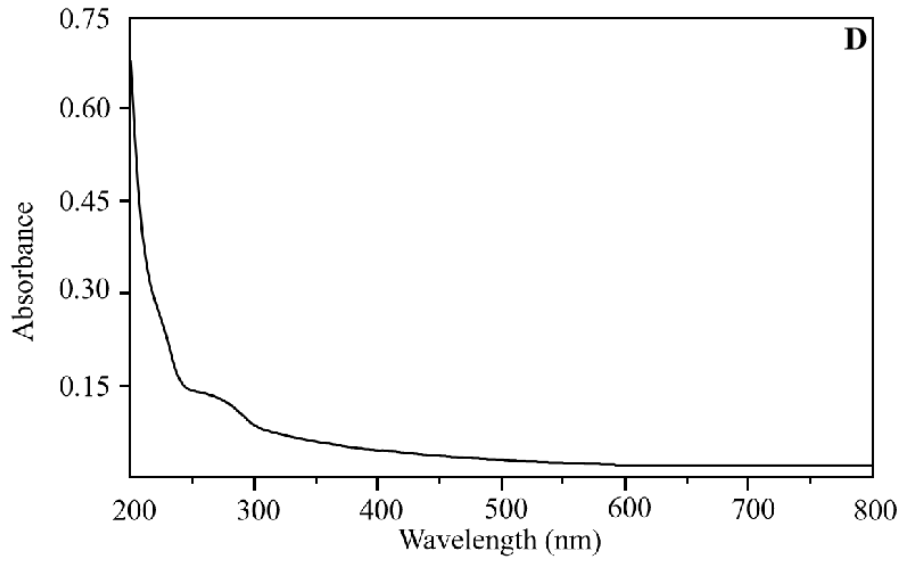
**Figure S1** Preparation and purification of CFP.



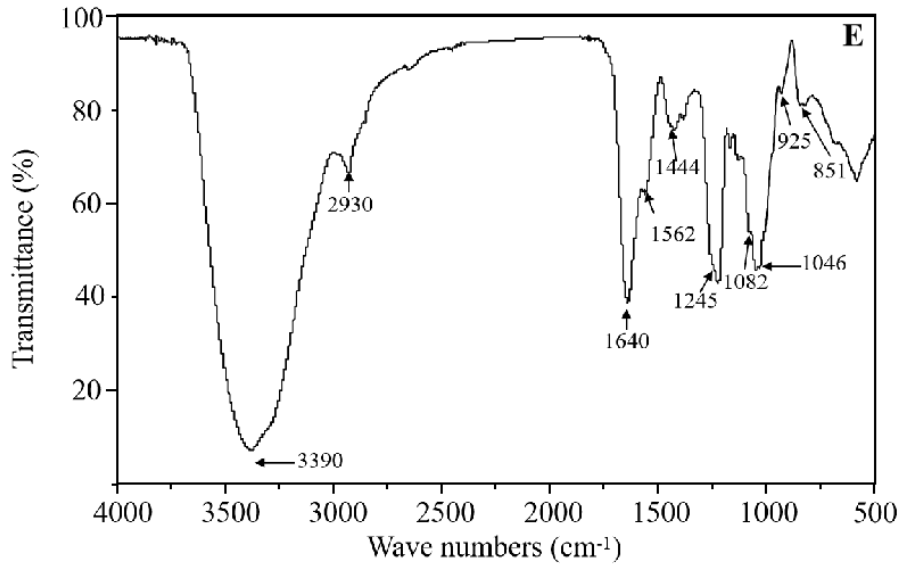
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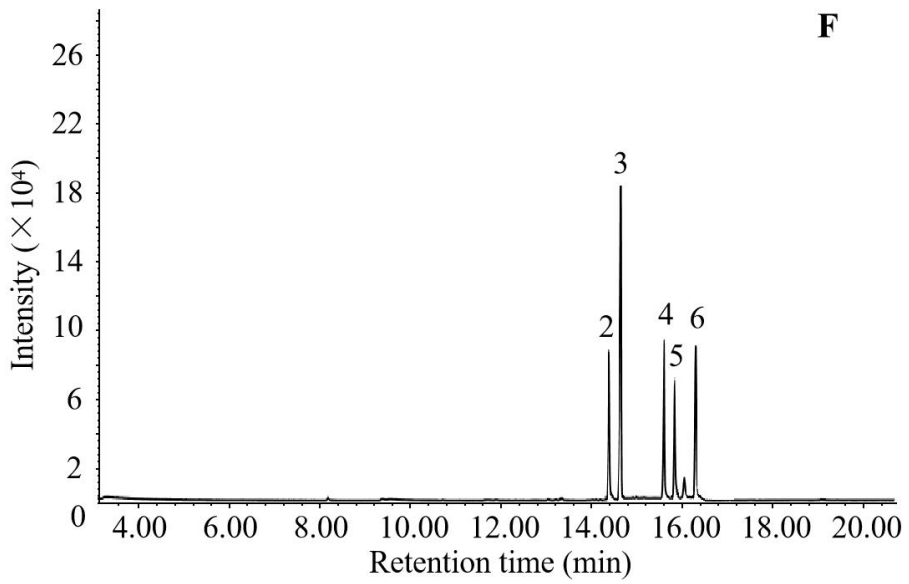
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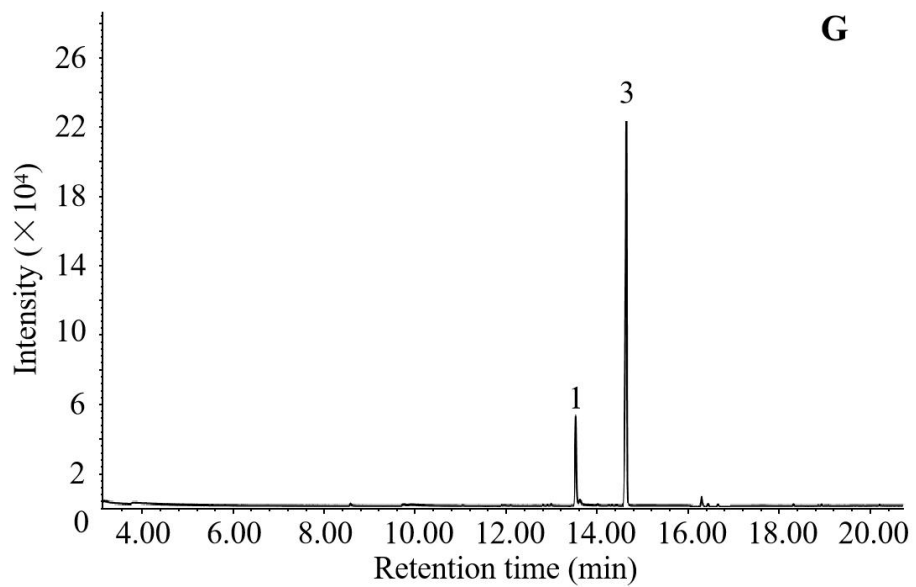
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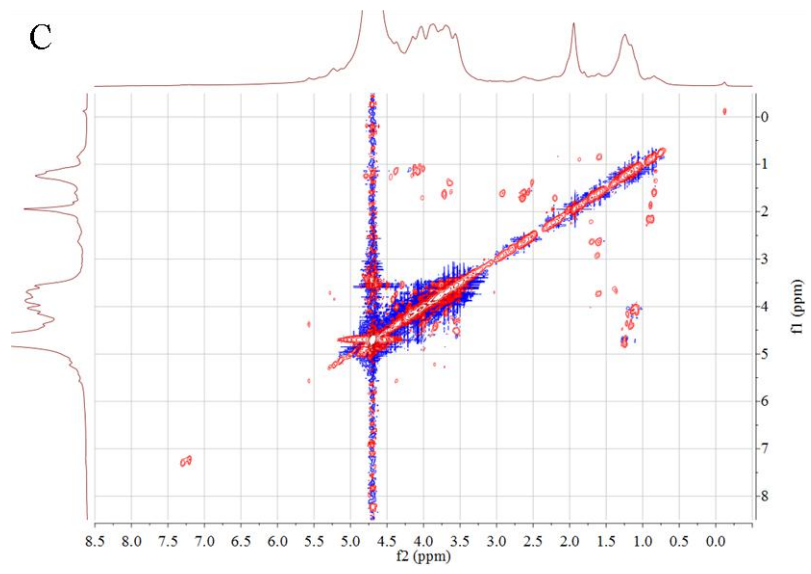
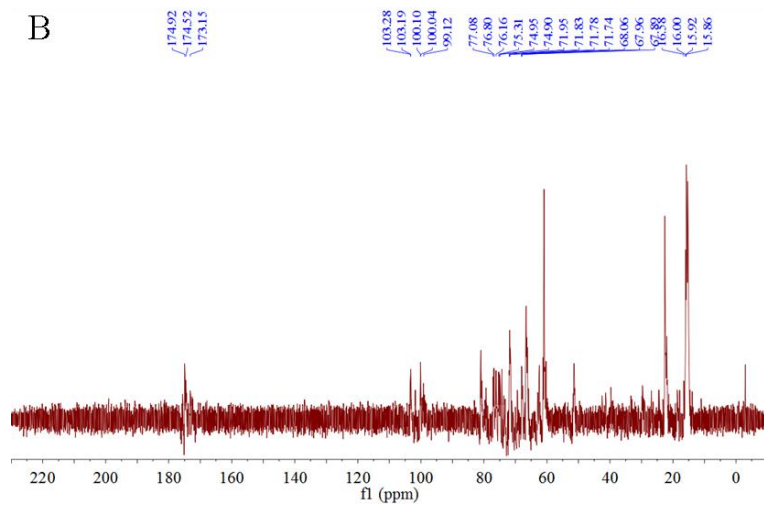
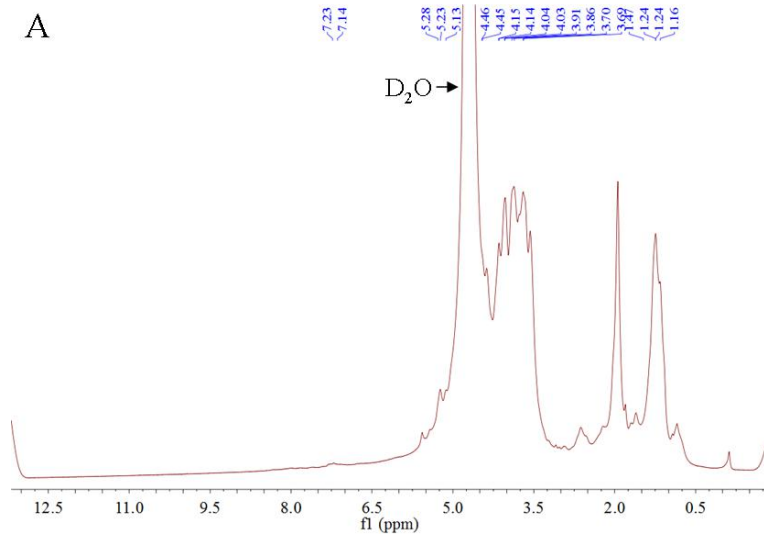
7 **Figure S2** The graph of HPSEC (A), GC (B and C), UV-is (D), FT-IR (E), GC-MS (F

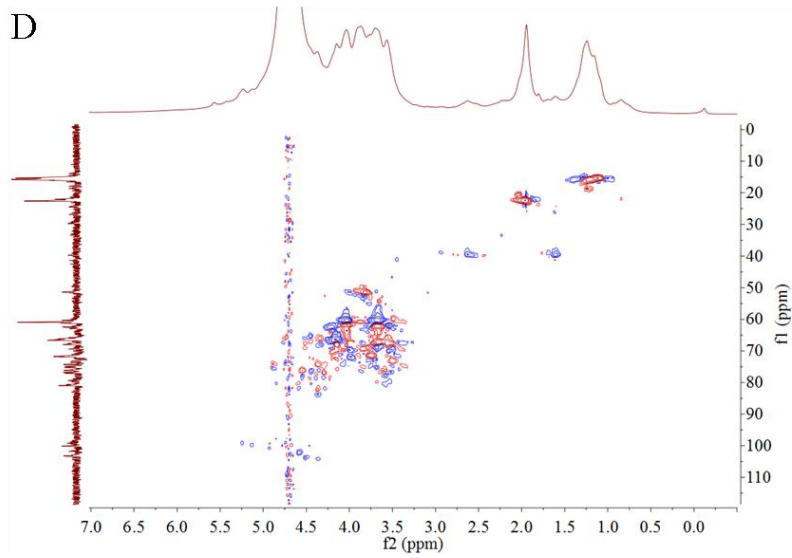
8 and G).

9 **Table S1** GC-MS results of CFP and dsCFP.

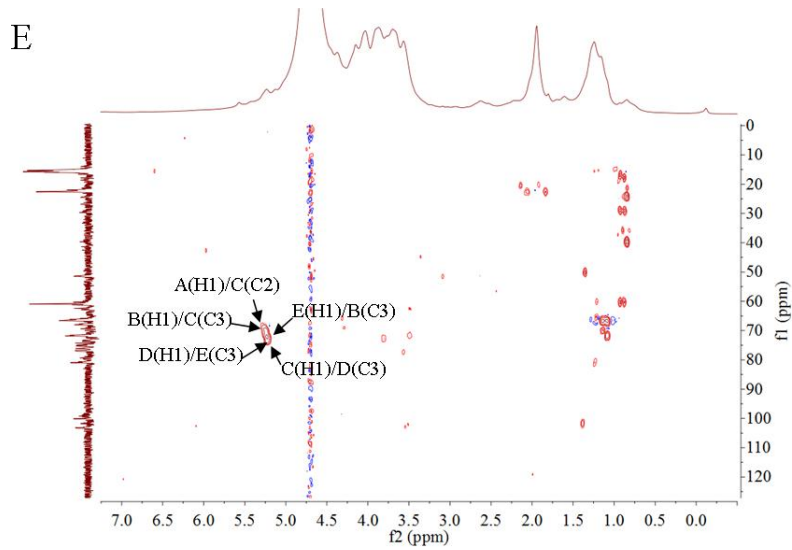
No.	Retention time (min)	Methylated sugar residue	Linkage	Molar ratio	
				CF P	dsCF P
1	13.978	1, 5-di-O-acetyl-2, 3, 4-tri-O-methyl-Fuc	L-Fucp-(1→	-	1.00
2	14.396	1, 4, 5-tri-O-acetyl-2, 3-di-O-methyl-Fuc	→4)-L-Fucp-(1→	1.00	-
3	14.702	1, 3, 5-tri-O-acetyl-2, 4-di-O-methyl-Fuc	→3)-L-Fucp-(1→	1.92	5.18
4	15.601	1, 2, 3, 5-tetra-O-acetyl-4-mono-O-methyl-Fuc	→2,3)-L-Fucp-(1→	1.05	-
5	15.814	1, 3, 4, 5-tetra-O-acetyl-2-mono-O-methyl-Fuc	→3,4)-L-Fucp-(1→	0.89	-
6	16.322	1, 2, 3, 4, 5-penta-O-acetyl-Fuc	→2,3,4)-L-Fucp-(1→	1.07	-

10 “-” means not detected.





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16 **Figure S3**  $^1\text{H}$  NMR(A)、 $^{13}\text{C}$  NMR(B)、 $^1\text{H}$ - $^1\text{H}$  COSY(C)、 $^1\text{H}$ - $^{13}\text{C}$  HSQC (D)和  $^1\text{H}$ - $^{13}\text{C}$

17 HMBC (E) of CFP

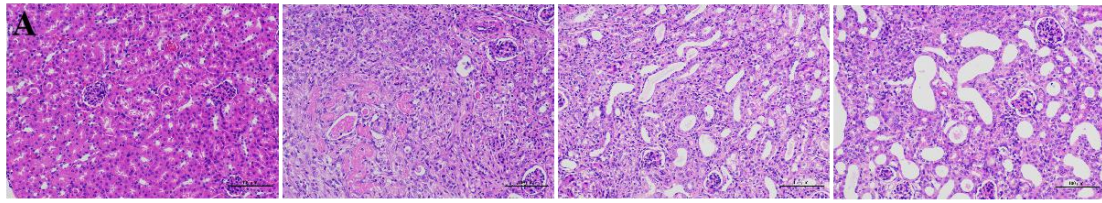


18 **Table S2**  $^{13}\text{C}$  and  $^1\text{H}$  chemical shifts of sugar residues in CFP.

Sugar residues		Chemical shifts (ppm)						
		1	2	3	4	5	6	
A	$\text{SO}_3^-$ -O-4- $\alpha$ -L-Fucp-(1 $\rightarrow$	H	5.28	3.91	4.37	4.14	4.46	1.16
		C	99.12	69.68	71.74	74.95	67.82	16.58
B	$\rightarrow$ 3)- $\alpha$ -L-Fucp-(1 $\rightarrow$	H	5.28	3.91	4.29	4.15	4.45	1.24
		C	100.04	69.72	71.83	75.31	67.89	15.82
C	$\rightarrow$ 2 $\text{SO}_3^-$ ,3)- $\alpha$ -L-Fucp-(1 $\rightarrow$	H	5.23	4.15	4.28	4.15	4.42	1.24
		C	100.10	69.78	71.95	76.16	67.96	15.92
D	$\rightarrow$ 3,4 $\text{SO}_3^-$ )- $\alpha$ -L-Fucp-(1 $\rightarrow$	H	5.23	3.86	4.28	4.14	4.42	1.47
		C	103.19	69.87	72.88	76.80	67.96	16.00
E	$\rightarrow$ 2 $\text{SO}_3^-$ ,3,4 $\text{SO}_3^-$ )- $\alpha$ -L-Fucp-(1 $\rightarrow$	H	5.13	4.04	4.28	4.15	4.46	1.47
		C	103.28	69.97	72.35	77.08	68.06	16.58

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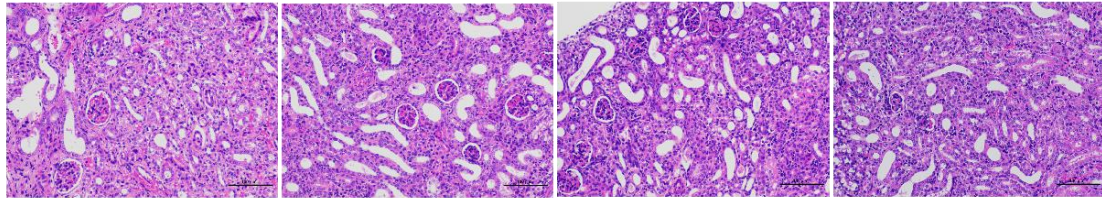


Sham

UUO

25 mg/kg CFP

50 mg/kg CFP



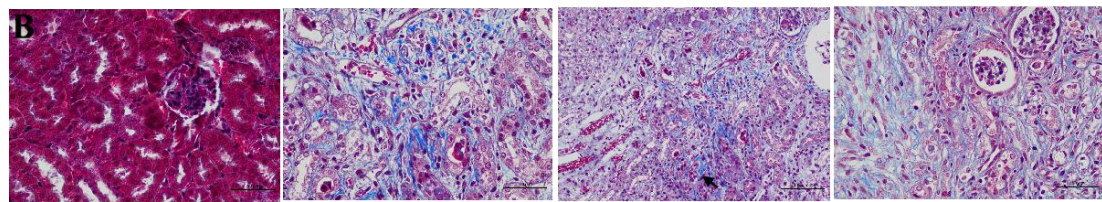
100 mg/kg CFP

200 mg/kg CFP

400 mg/kg CFP

800 mg/kg CFP

22

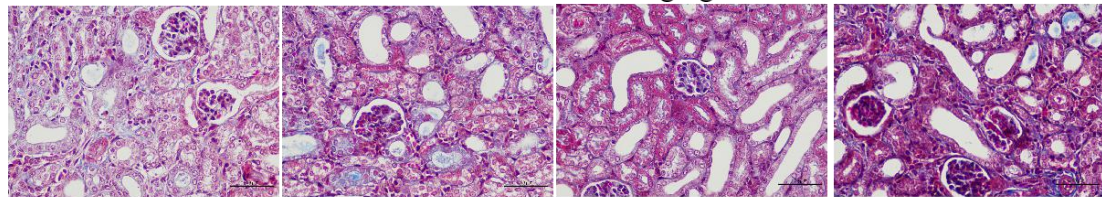


Sham

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25 mg/kg CFP

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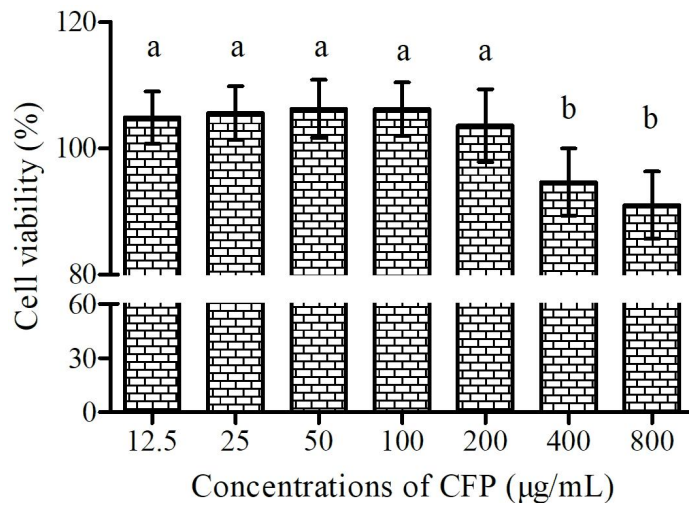
400 mg/kg CFP

800 mg/kg CFP

23

24 **Figure S5** The histopathological observation based on H&E (A) and Masson staining

25 (B) of pre-experiment results



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27 **Figure S6** Cell viability of CFP (different letters in superscript represent significant

28 differences,  $P < 0.05$ )