Supporting Information

Inhibition of Liver Tumor Cell Metastasis by Partially Acetylated Chitosan Oligosaccharide on A Tumor-Vessel Microsystem

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Supplementary information:

Figure S1. The operating schematic of the human tumor metastasis microsystem.

Figure S2. MTT assay. Statistical analysis the viability of HepG2 cells treated by COS, paCOS (F_A = 0.46), and NACOS at the concentration of 100 μg/mL for 24 h. 5-Fu (100 μg/mL) was used as a positive control. Data are represented as the means ± SD (n = 8), *P < 0.05, **P < 0.01, ****P < 0.0001.

Figure S3. Inhibitory effects of paCOS with F_A 0.46 on liver tumor cells proliferation. Statistical analysis of the proliferation rate of SMMC-7721 cells (A) and MHCC97-L cells treated by paCOS with F_A 0.46 at different concentrations dissolved in culture medium on the tumor-vessel microsystem for 24 h. 5-Fu (100 μg/mL) was used as a positive control. Data are represented as the means ± SD (n = 5), **P < 0.01, ****P < 0.0001.

Figure S4. Inhibitory effects of paCOS with F_A 0.46 on the viability and permeability of endothelial cells (EAhy926). Statistical analysis of the viability (A) and the P_{app} value (B) of EAhy926 cells treated by paCOS at different concentrations dissolved in culture medium on the microfluidic chip for 24 h. 5-Fu (100 μg/mL) was used as a positive control. Data are represented as the means ± SD (n = 5), ** P < 0.01, *** P <0.05, **** P < 0.0001.

Figure S5. Inhibitory effects of paCOS with F_A 0.46 on liver tumor cells invasion. HE staining views (scale bar: 100 μm) (A) and statistical analysis (B) of the invasion rate of HepG2 cells treated by paCOS with F_A 0.46 at different concentrations dissolved in culture medium on Transwell system for 24 h. 5-Fu (100 μg/mL) was used as a positive control. Data are represented as the means ± SD (n = 5), **P < 0.01, ***P <0.05, ****P < 0.0001.

Figure S1

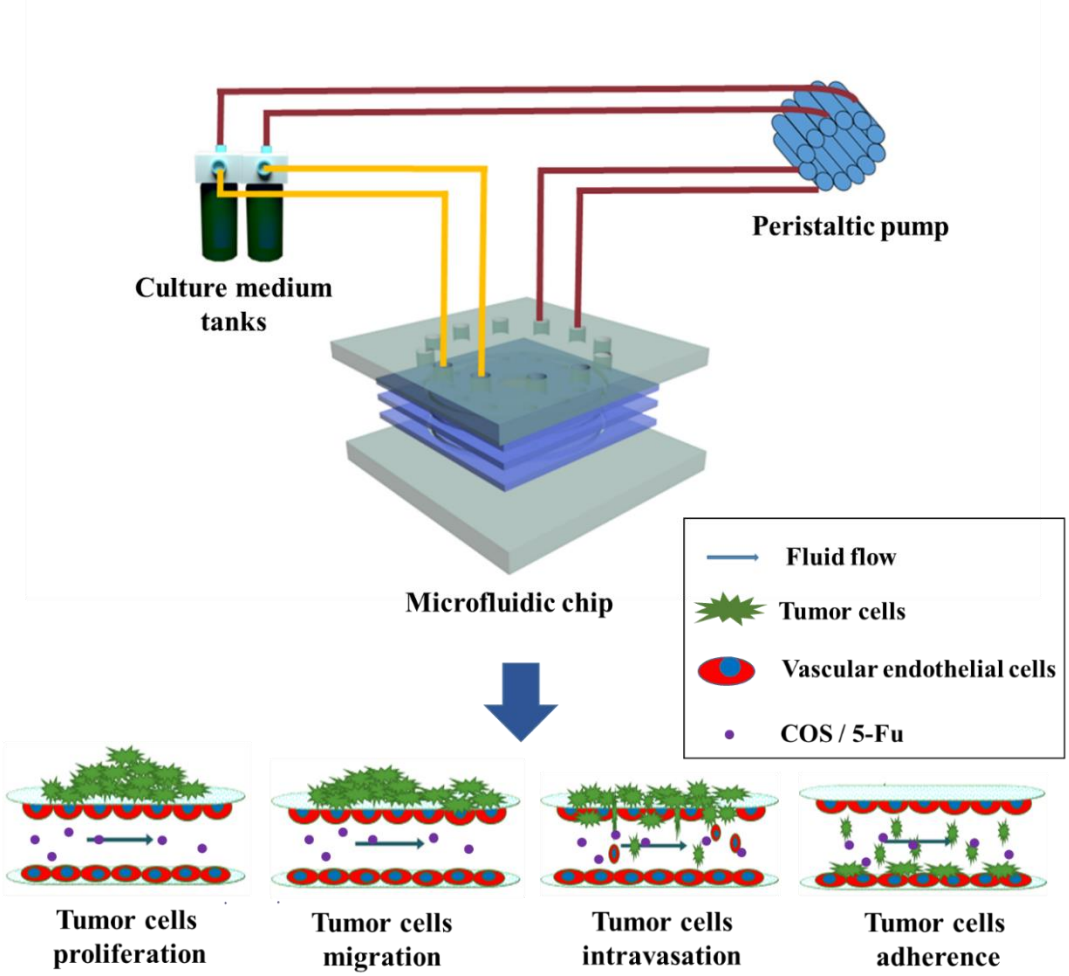

Peristaltic pump
Culture medium tanks
Microfluidic chip
Fluid flow
Tumor cells
Vascular endothelial cells
COS / 5-Fu
Tumor cells proliferation
Tumor cells migration
Tumor cells intravasation
Tumor cells adherence

Figure S2

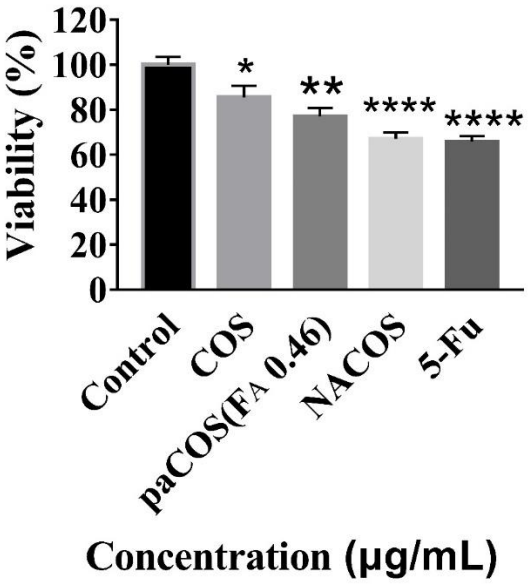

Viability (%)
120
100
80
60
40
20
0
*
**
****
****
Control
COS
paCOS(FA 0.46)
NACOS
5-Fu
Concentration (μg/mL)

Figure S3

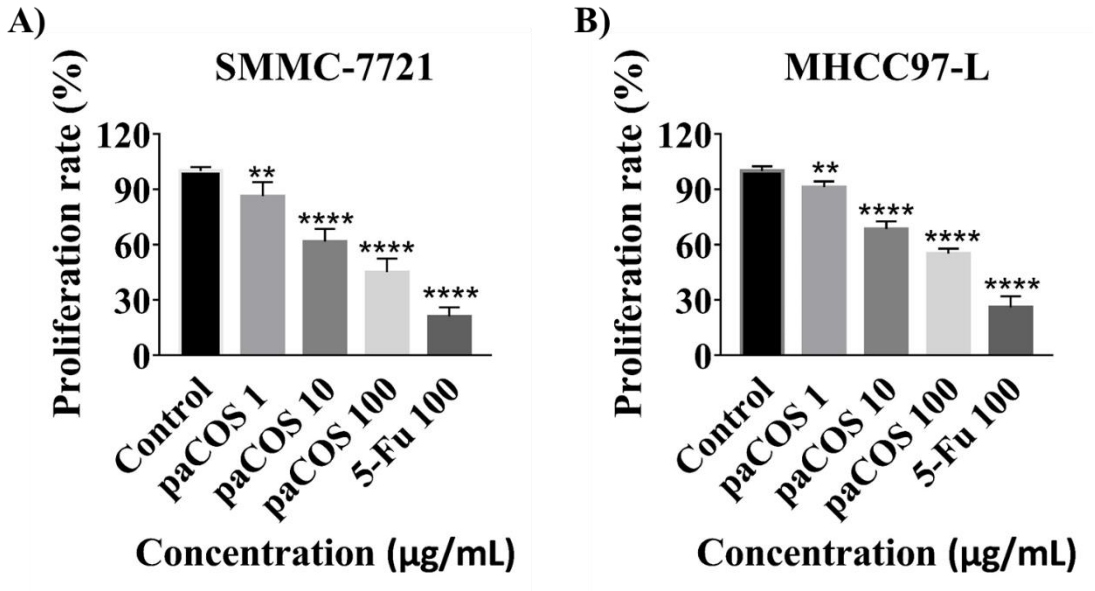

A)
SMMC-7721
Proliferation rate (%)
120
90
60
30
0
**
****
****
****
Control
paCOS 1
paCOS 10
paCOS 100
5-Fu 100
Concentration (μg/mL)
B)
MHCC97-L
Proliferation rate (%)
120
90
60
30
0
**
****
****
****
Control
paCOS 1
paCOS 10
paCOS 100
5-Fu 100
Concentration (μg/mL)

Figure S4

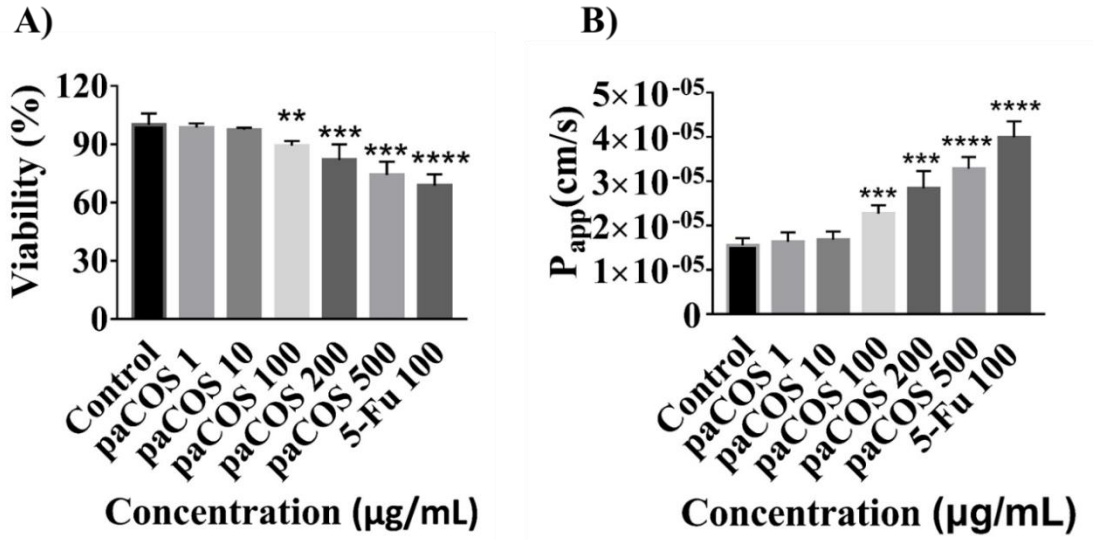
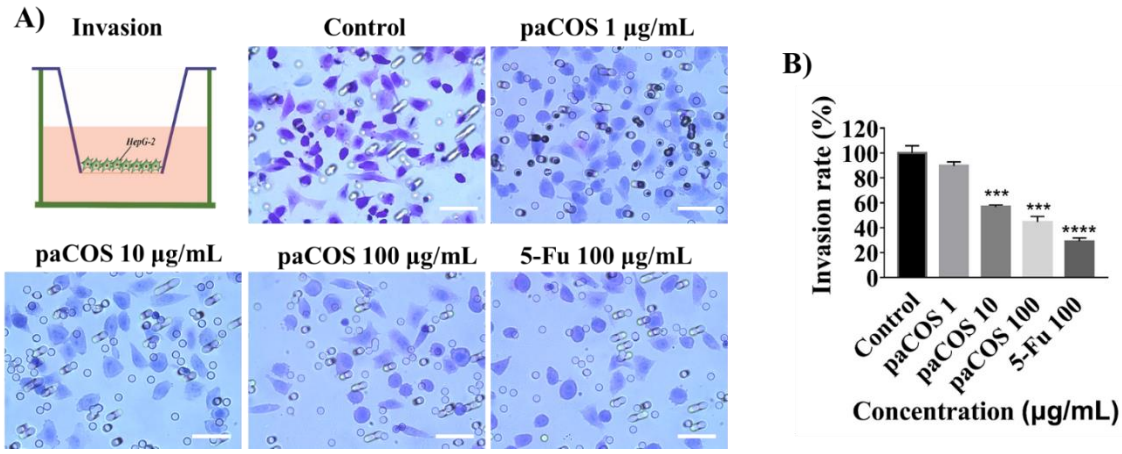

A)
Viability (%)
120
90
60
30
0
**
***
***
****
Control
paCOS 1
paCOS 10
paCOS 100
paCOS 200
paCOS 500
5-Fu 100
Concentration (μg/mL)
B)
P app (cm/s)
5×10-05
4×10-05
3×10-05
2×10-05
1×10-05
0
***
***
****
****
Control
paCOS 1
paCOS 10
paCOS 100
paCOS 200
paCOS 500
5-Fu 100
Concentration (μg/mL)

Figure S5


A)
Invasion
HepG-2
Control
paCOS 1 μg/mL
paCOS 10 μg/mL
paCOS 100 μg/mL
5-Fu 100 μg/mL
B)
Invasion rate (%)
120
100
80
60
40
20
0
***
***
****
Control
paCOS 1
paCOS 10
paCOS 100
5-Fu 100
Concentration (μg/mL)