# Supplemental material

## Experimental

**Dynamic light scattering**

To measure the hydrodynamic diameter of MPs in endothelial cell growth basal medium+ 0.05% FBS, the dynamic light scattering (DLS) particle sizer (ZetaSizer Nano ZS90, Malvern Inc.) were used.

**Immunohistochemical Analyses**

IHC staining for CD31 in aorta tissue sections with CD31 antibody (ab182981, Abcam, Shanghai, China) at 4°C overnight, and treatment with the secondary antibodies for 60 min. The slices were treated with a 3,3'-diaminobenzidine (DAB) and observed using microscopic microscope (Carl Zeiss Instruments, Germany, Germany)

**Histopathological analysis**

The liver sections was stained with Oil red O kit (ab150678, Abcam, Shanghai, China) to measure the lipid deposition.

**Lactate dehydrogenase release assay**

The cells ($1\times10^4$ cells/well) were treated with 20 nm, 100 nm or 10 μm MP (1000 μg/mL) for 24 h. The medium was collected and measured using the LDH Cytotoxicity Detection Kit (Beyotime Biotechnology, Shanghai, China). LDH release was presented as the percentage relative to the untreated group.

# Results

## Characterization of the MPs by dynamic light scattering

DLS results showed that the mean sizes for the different sizes (20 nm, 50 nm, 100 nm, 500 nm) of MPs.

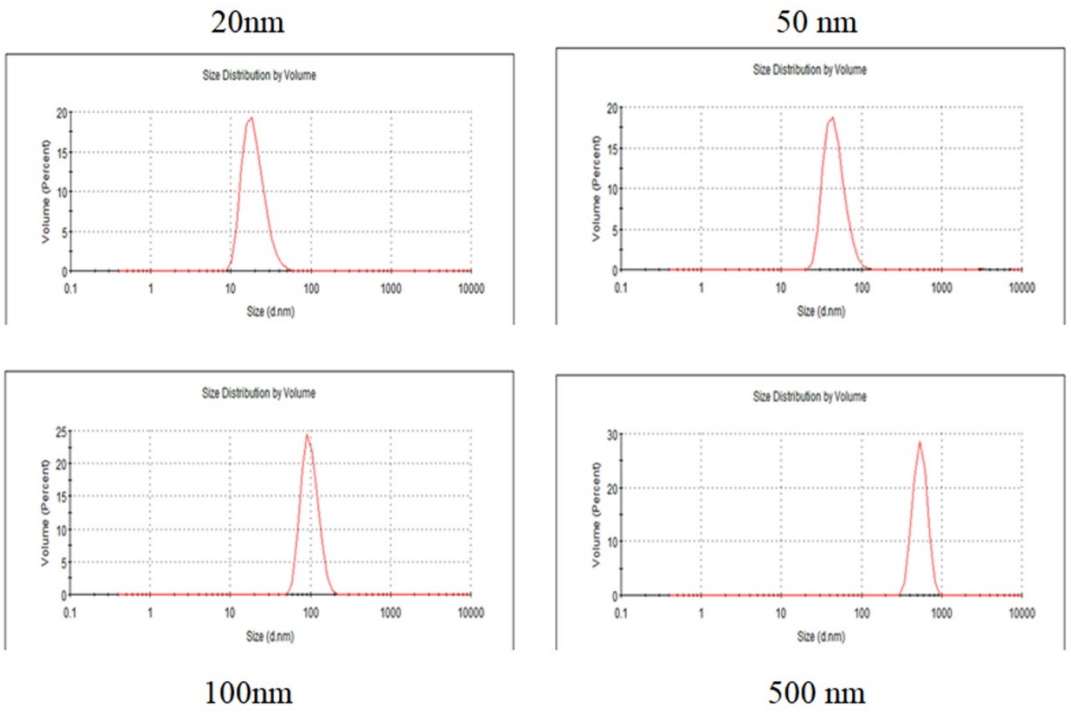


Fig. 1S. Size of MPs determined by DLS.

## Effect of MPs on the body weight in AS mice

There was no significant difference body weight was observed between MPs treated groups and untreated group during the experimental period, indicating that MPs administration had no role in the AS mice body weight.

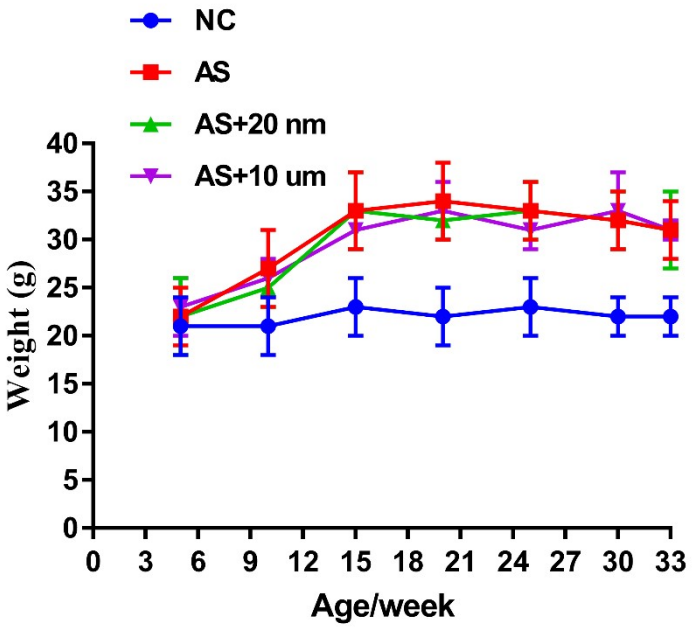


Fig. 2S Effect of MPs on the body weight in AS mice

**Atherosclerotic intima lesion analysis**

We assessed the CD31 expression in NC group, AS group and the MPs treated AS mice group. Immunohistochemistry data revealed that the MPs leads to a decrease in CD31 expression compared with that of untreated group.

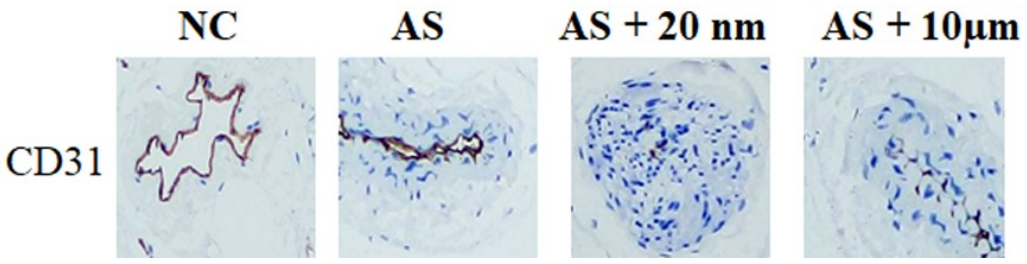


Fig. 3S Effect of MPs on the CD31 level in AS mice aorta

**Effect of MPs on the lipid deposition in the liver of AS mice**

The Oil Red O-positive staining in the liver was observed in the AS group and MPs group. The relative lipid deposition was enhanced from 28.3 ± 2.1% (AS group) to 66.1 ± 4.7 % and 63.2 ± 4.5% in the 20nm MPs and 10 μm MPs group, respectively. At the same time, no significant different was observed between the 20nm MPs and 10 μm MPs group.

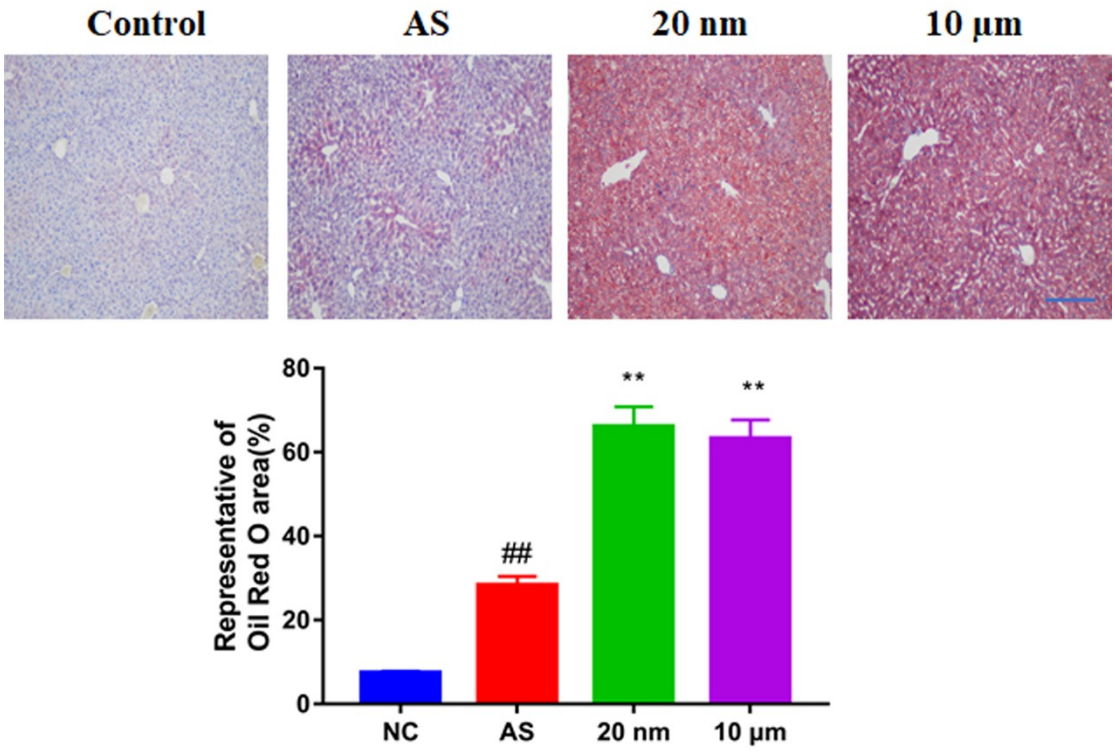


Fig. 4S Effect of MPs on the lipid deposition in liver

**Determination of LDH release**

We found that 20 nm, 100 nm and 10μm MPs increases LDH release in ECs.

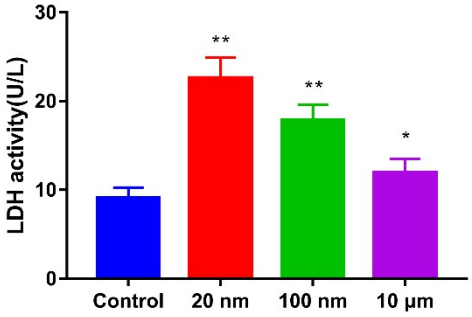


Fig. 5S Effect of MPs on the LDH in ECs