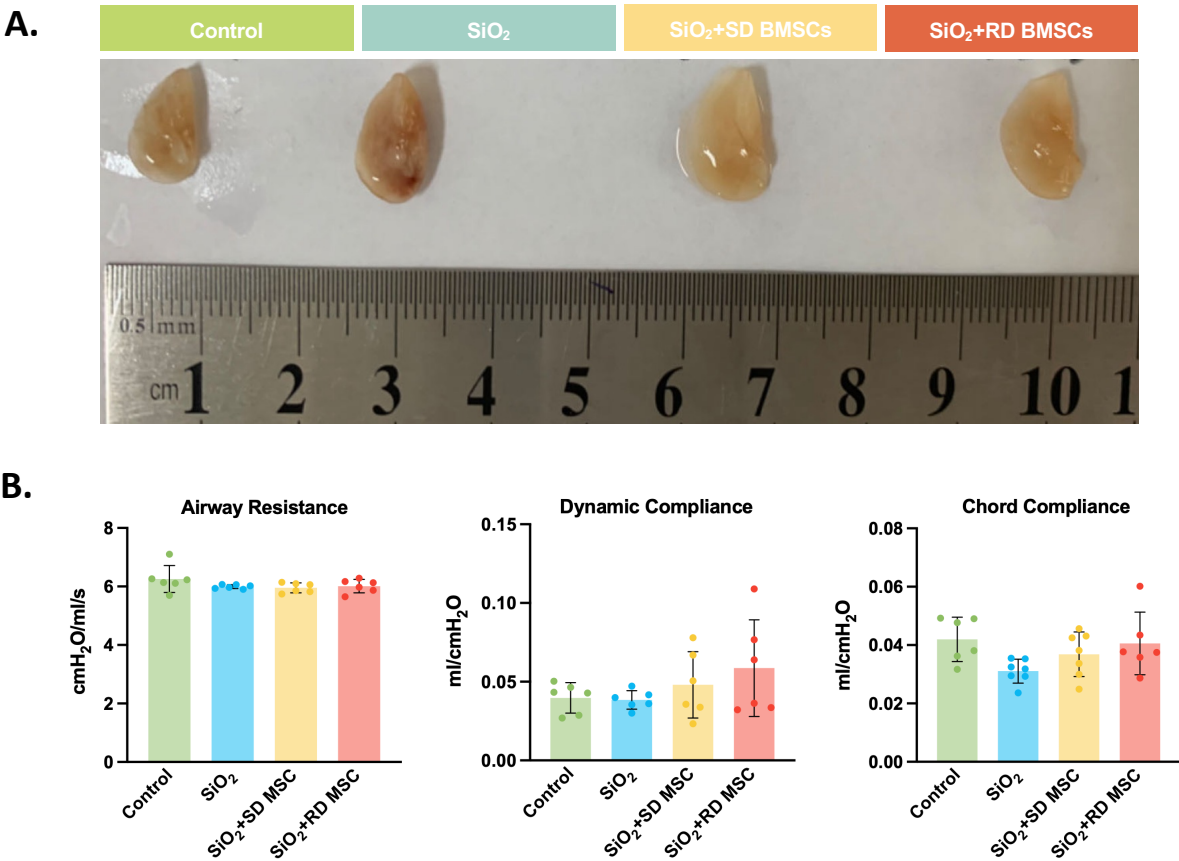


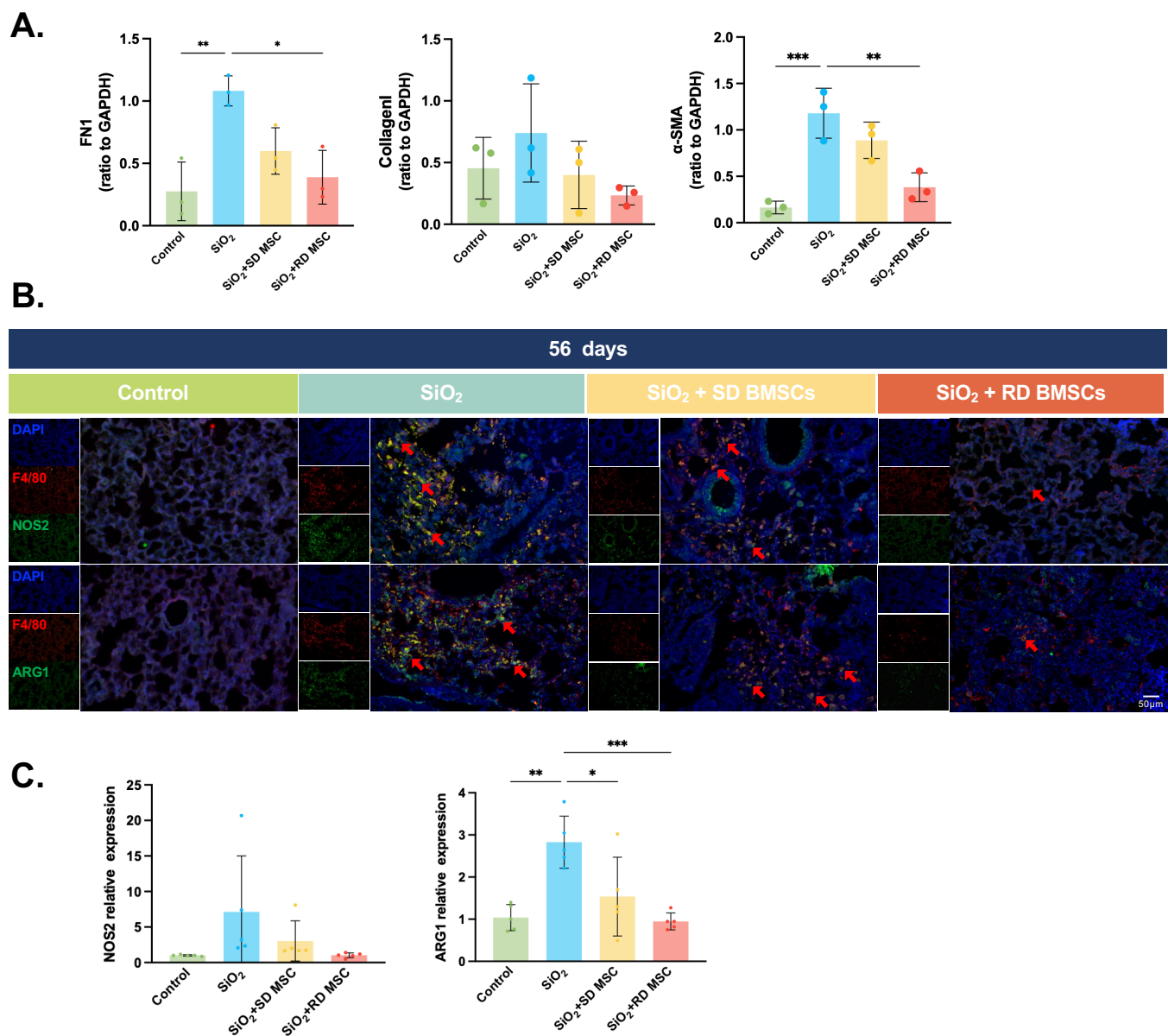
Supplementary Figure
Figure.S1



Supplementary Figure1

- A. Representative gross appearances of lungs in each group on d56.
- B. Pulmonary function parameters including airway resistance, dynamic compliance and chord compliance were measured in mice using a lung function testing system (n = 6).

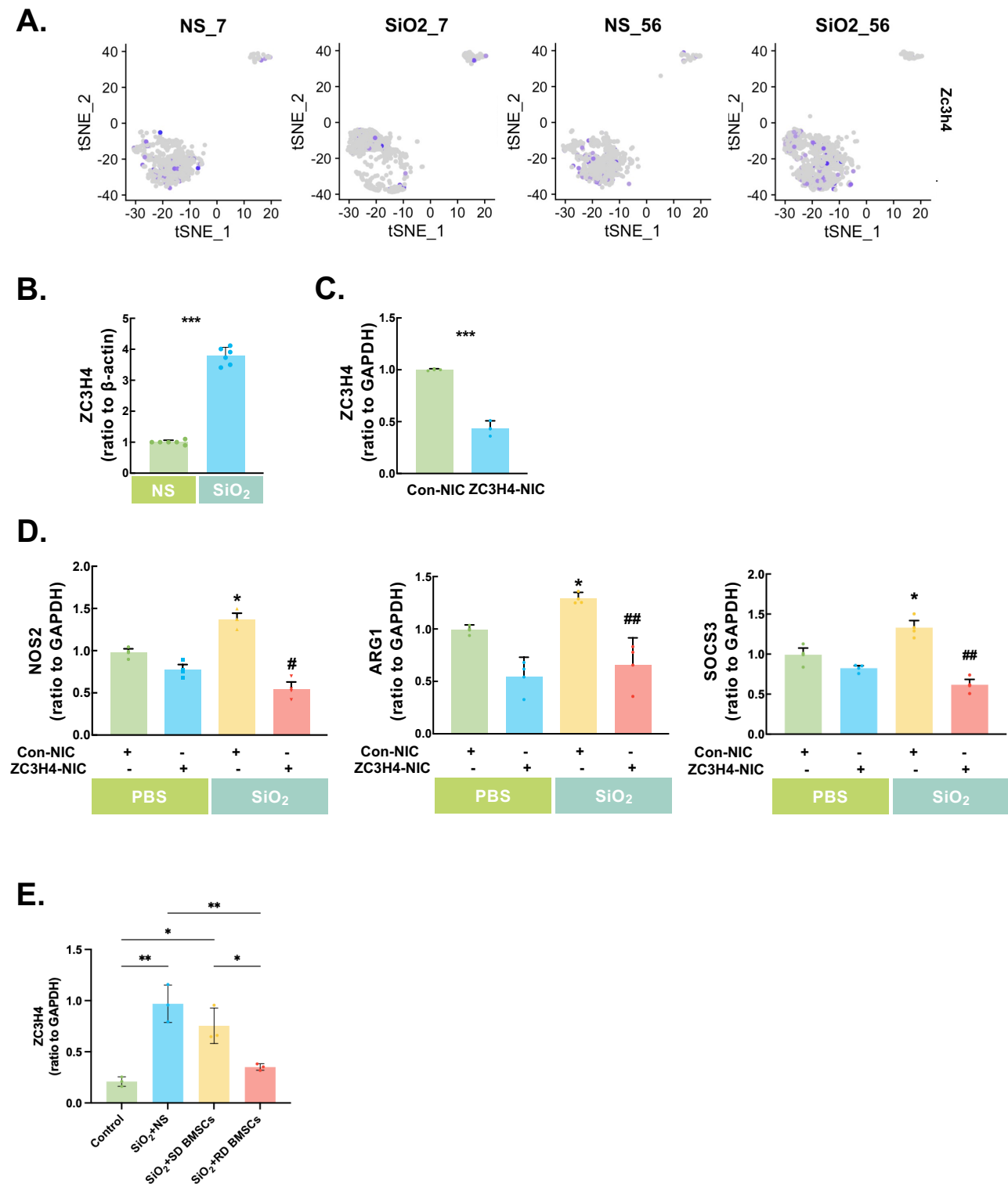
Figure.S2



Supplementary Figure2

- A. Western blot quantification of fibrotic markers FN1, Collagen I, and α-SMA in each group; ** $P < 0.01$, *** $P < 0.001$, **** $P < 0.0001$; two-way ANOVA.
- B. Immunofluorescence staining of lung tissue showing co-localization of F4/80 (red) with NOS2 (green, Line 1) and ARG1 (green, Line 2). Nuclei stained with DAPI. Scale bar = 50 μm.
- C. qPCR quantification of NOS2 and ARG1 mRNA levels in lung tissues from Control, SiO₂, SiO₂ + SD BMSC, and SiO₂ + RD BMSC groups. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$; two-way ANOVA. (n = 5 per group).

Figure.S3



Supplementary Figure3

- A. tSNE plot showing the expression patterns of Zc3h4 in lung cells from NS-7d, SiO₂-7d, NS-56d, and SiO₂-56d mice.
- B. Western blot quantification of ZC3H4 protein expression in alveolar macrophages.
- C. Quantification of ZC3H4 knockout efficiency. *** $P < 0.001$, t -test.
- D. Densitometric quantification of NOS2, ARG1, and SOCS3 expression following ZC3H4 knockdown. $P < 0.05$; # $P < 0.05$, ## $P < 0.01$; two-way ANOVA.
- E. Western blot quantification of ZC3H4 protein expression in each group. * $P < 0.05$, ** $P < 0.01$; two-way ANOVA.