Supporting Information

Hydrogenated Germanene Nanosheets as an Antioxidative Defense Agent for Acute Kidney Injury Treatment

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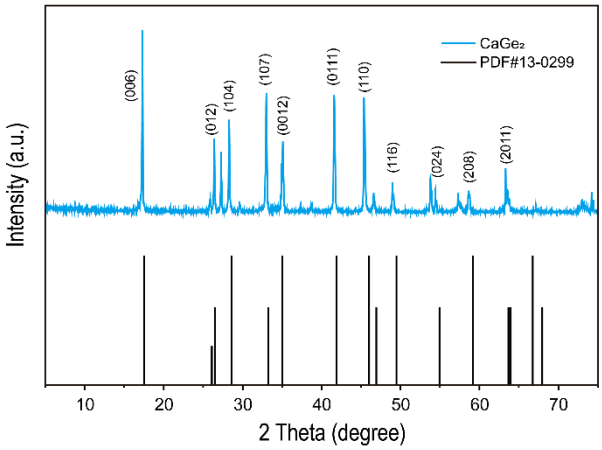

Figure S1. XRD pattern of precursor $CaGe_2$.

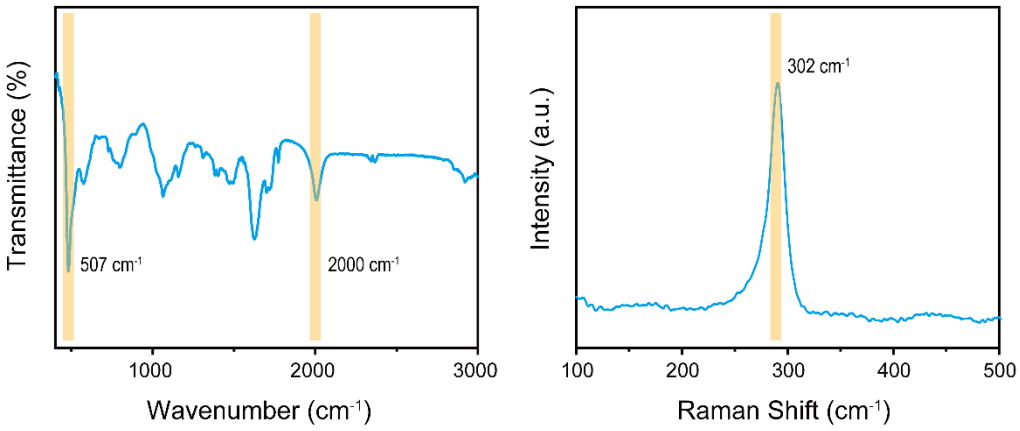

Figure S2. FITR and Raman spectra of H-germanene.

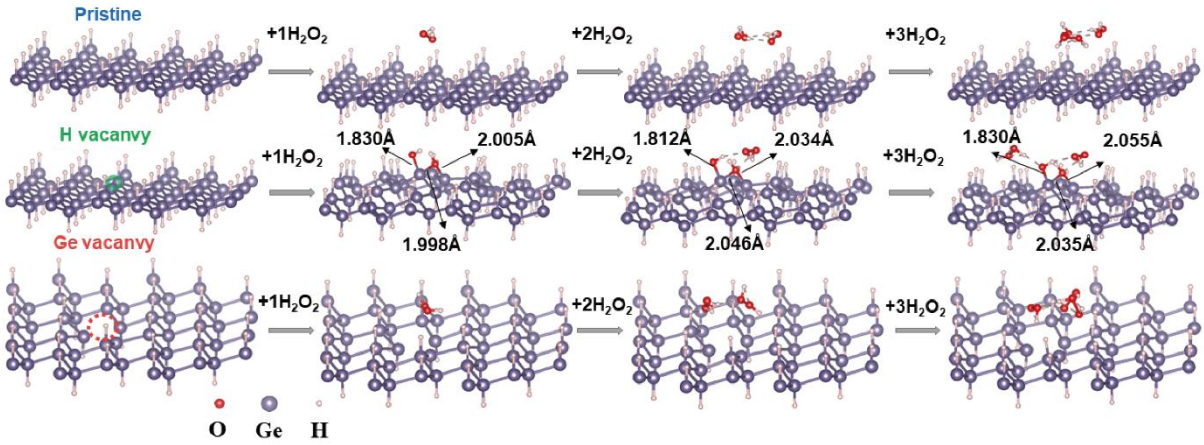

Figure S3. The surface structure change of *p*H-germanene, H*-germanene, and H-germanene* during the scavenging process of H_2O_2.

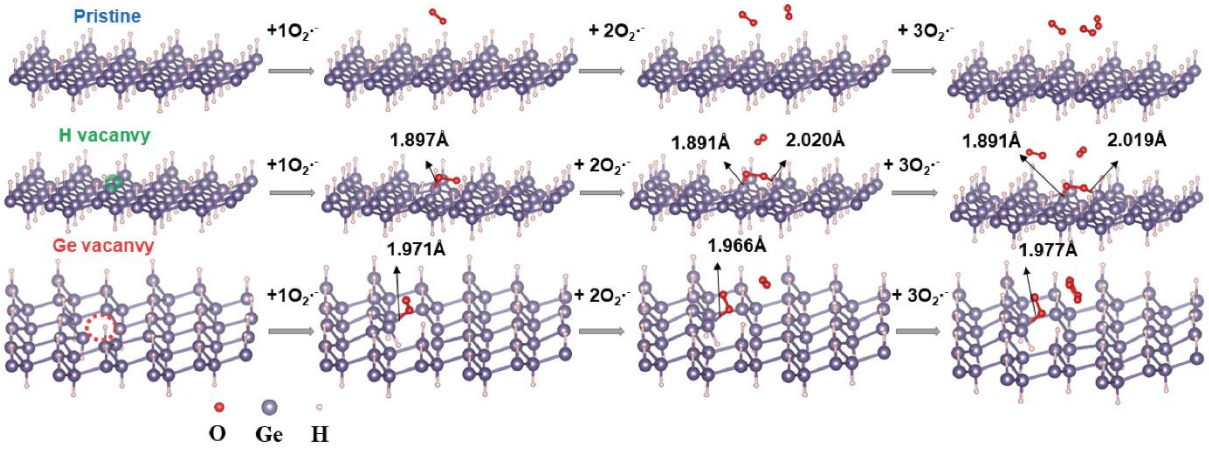

Figure S4. The surface structure change of *p*H-germanene, H*-germanene, and H-germanene* during the scavenging process of $O_2^{\bullet-}$.

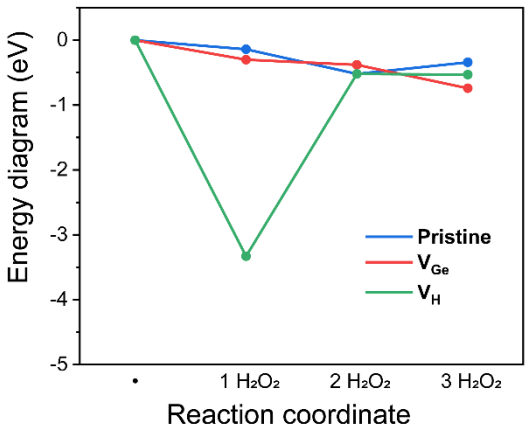

Figure S5. The energy diagram of *p*H-germanene, H*-germanene, and H-germanene* during the scavenging process of H_2O_2.

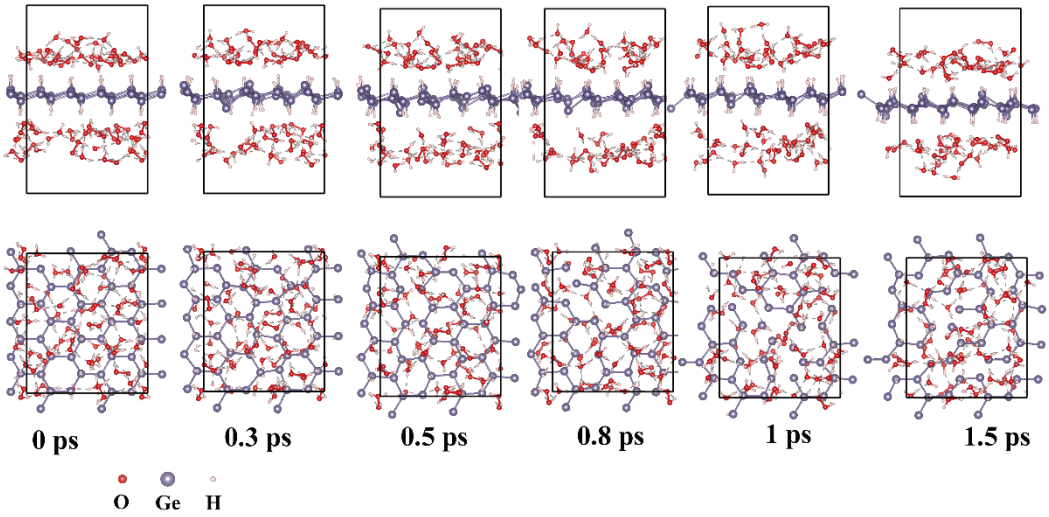

Figure S6. Molecular dynamics (MD) simulation in aqueous H_2O_2 solution with few H vacancies on the surface of H-germanene.

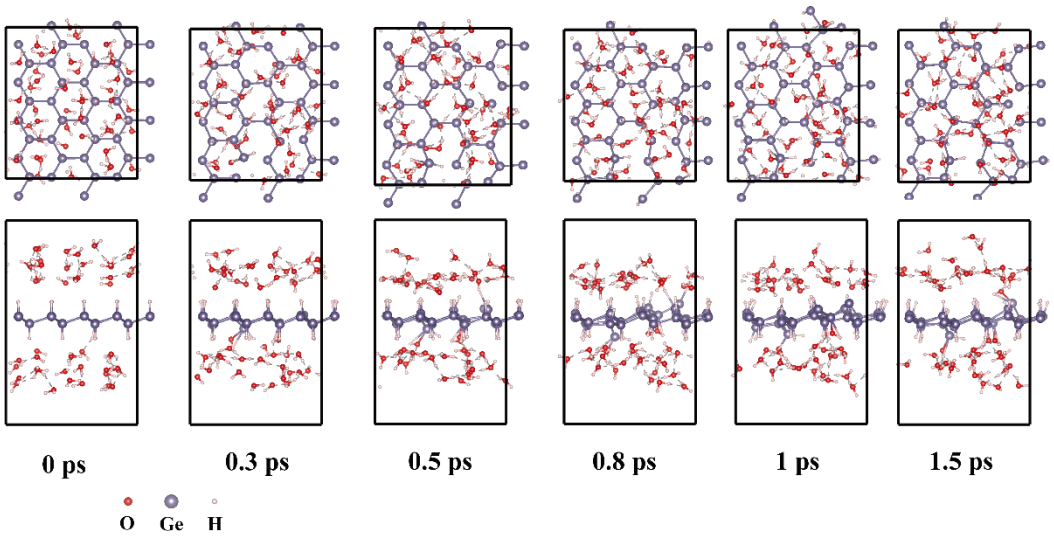

Figure S7. Molecular dynamics (MD) simulation in the solution containing ·OH when there are few H vacancies on the surface of H-germanene.

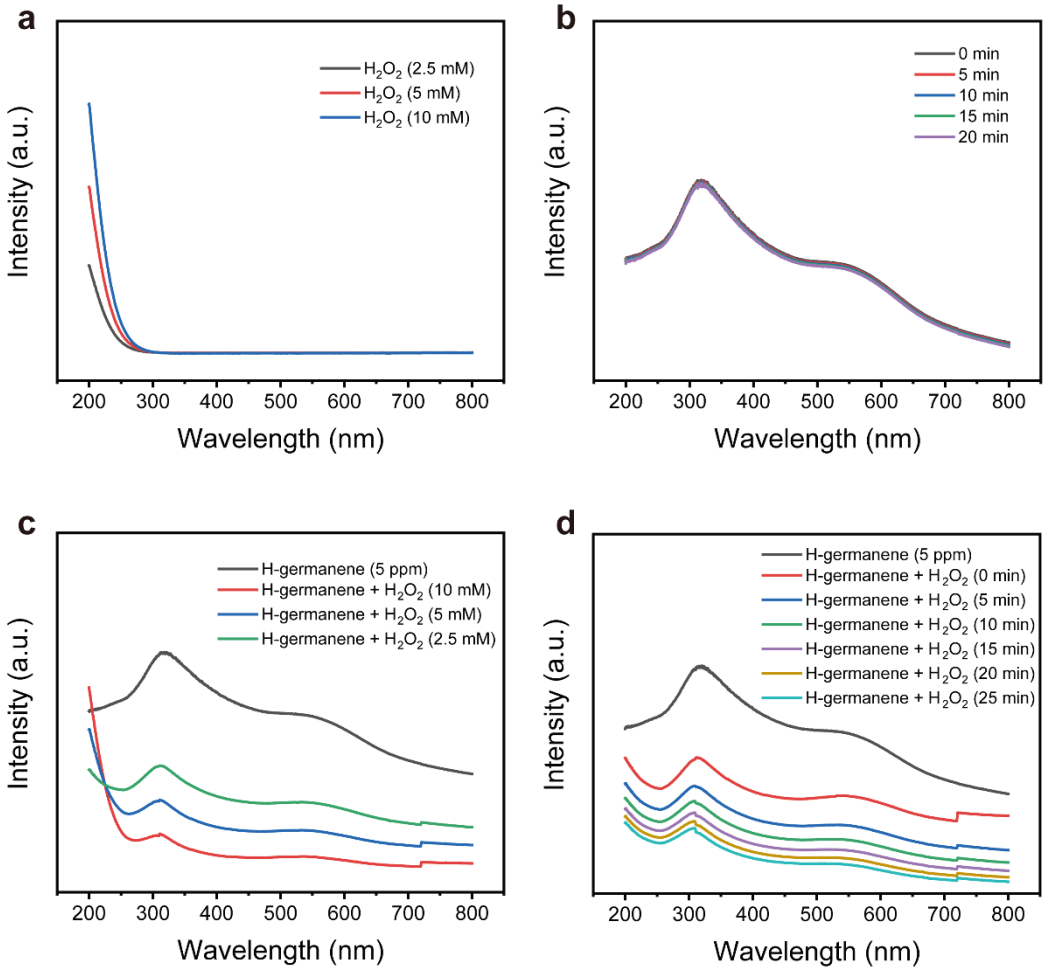

Figure S8. Absorbance spectra of different systems: (a) H_2O_2 of different concentrations, (b) H-germanene of different concentrations, (c) the systems containing H-germanene (5 ppm) and H_2O_2 of different concentrations, and (d) the systems containing H-germanene (5 ppm) and H_2O_2 (5 mM). ppm = μg mL^{-1}.

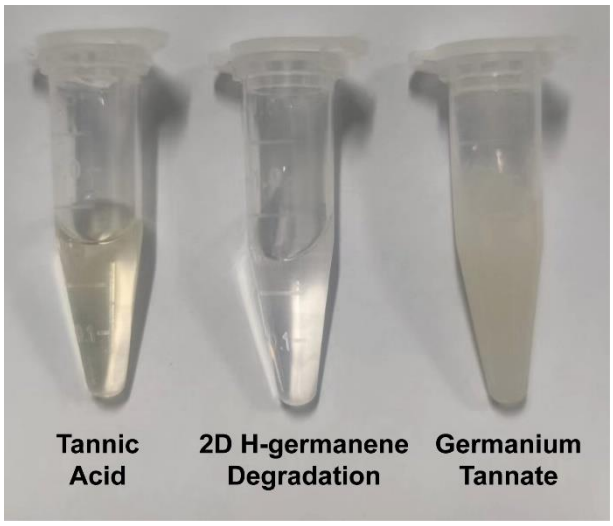

Figure S9. Identification of products after H-germanene scavenging ROS.

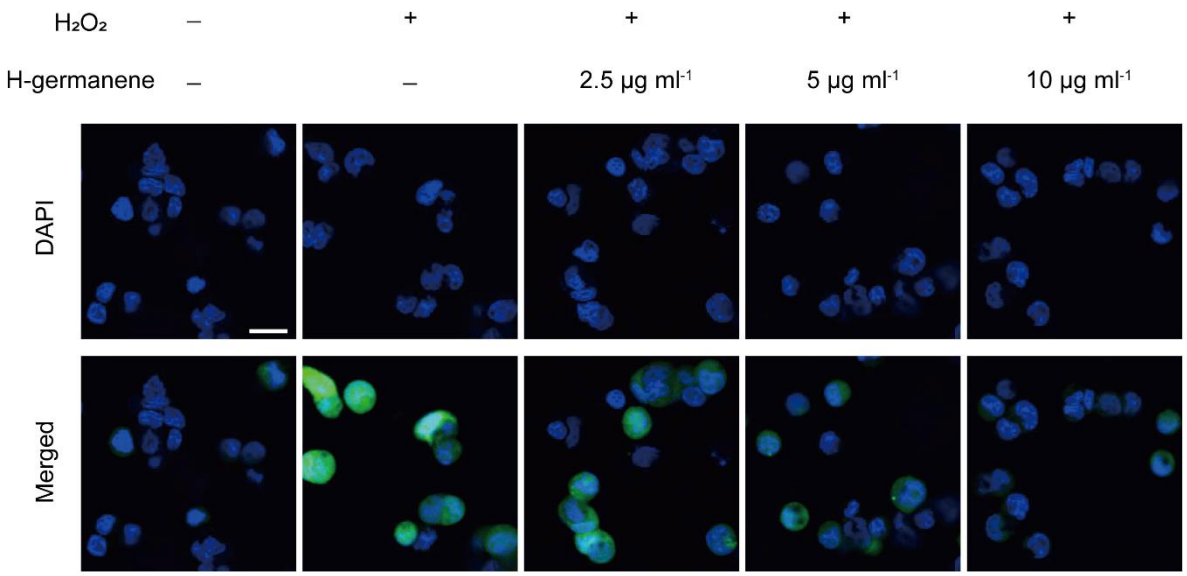

Figure S10. Confocal images of HEK293 cells under different treatments. ROS: green fluorescence; nucleus: blue fluorescence. Scale bar, 20 μm.

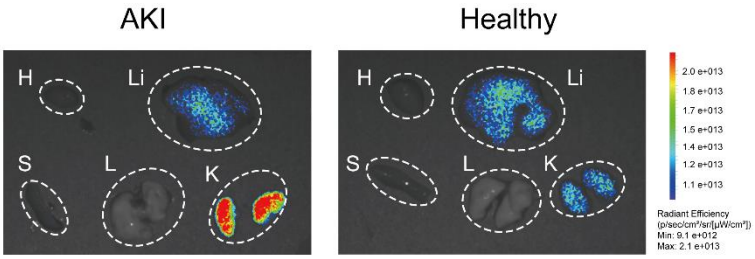

Figure S11. Fluorescence images of H-germanene in major organs (heart, liver, spleen, lung, and kidney) 12 hours after intravenous injection of H-germanene in healthy mice and AKI mice.

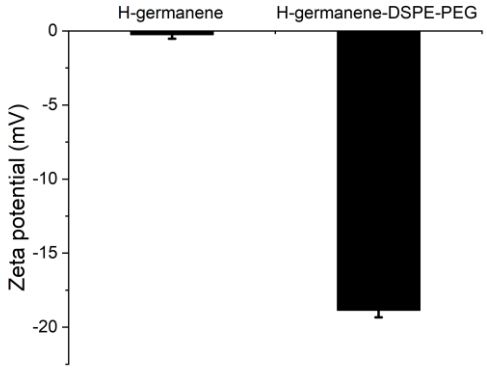

Figure S12. Zeta potential profile of H-germanene and H-germanene-DSPE-PEG dispersed in water.

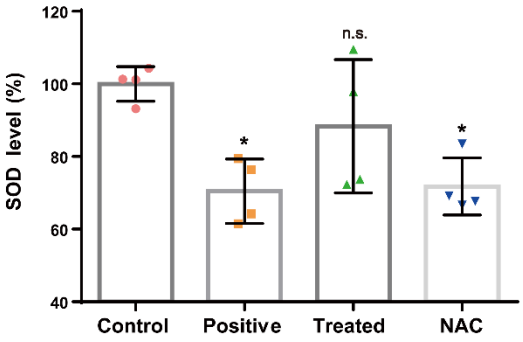

Figure S13. Renal SOD levels of mice in different groups (normal mice; AKI mice; AKI mice with intravenous injection of H-germanene; mice with intravenous injection of NAC). *P < 0.05; n.s., no significance, one-way ANOVA.

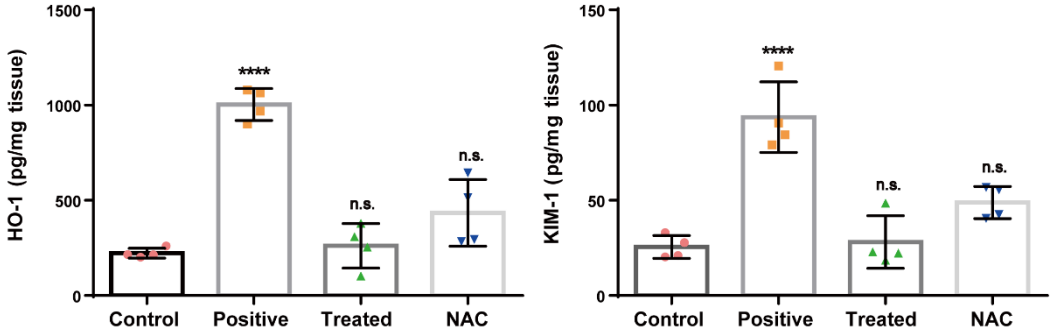

Figure S14. Renal HO-1 and KIM-1 levels of mice in different groups (normal mice; AKI mice; AKI mice with intravenous injection of H-germanene; mice with intravenous injection of NAC). ****P < 0.0001; n.s., no significance, one-way ANOVA.

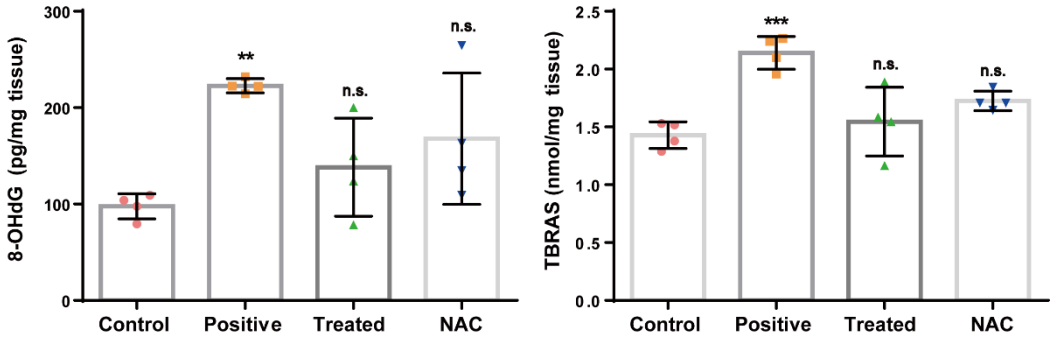

Figure S15. Renal 8-OHdG and TBRAS levels of mice in different groups (normal mice; AKI mice; AKI mice with intravenous injection of H-germanene; mice with intravenous injection of NAC). ***P < 0.001; **P < 0.01; n.s., no significance, one-way ANOVA.

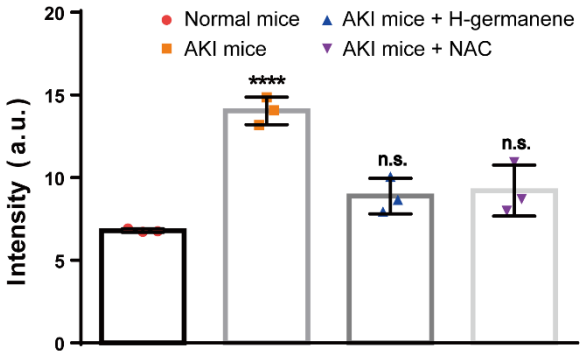

Figure S16. Quantitative statistics of superoxide in kidney slices of different groups.

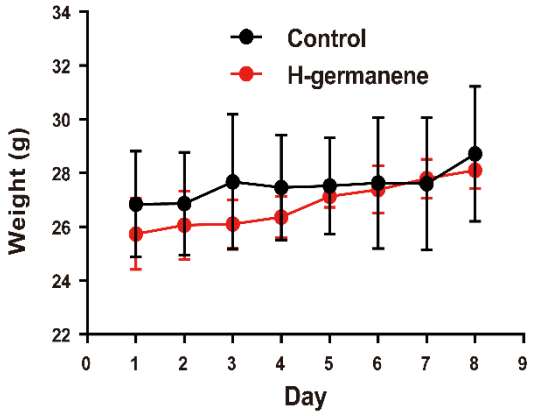

Figure S17. Body weight curve of mice after intravenous injection of H-germanene and PBS during seven days. Data represent means ± SD (*N* = 3).

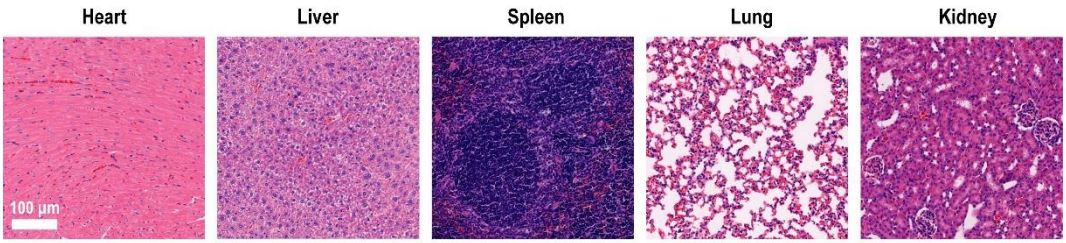

Figure S18. H&E staining of major organs (heart, liver, spleen, lung, and kidney) in healthy mice at 7 days after intravenous injection of H-germanene.