Supporting Information

Polydiacetylene-based hydrogel beads as colorimetric sensors for the detection of biogenic amines in spoiled meat

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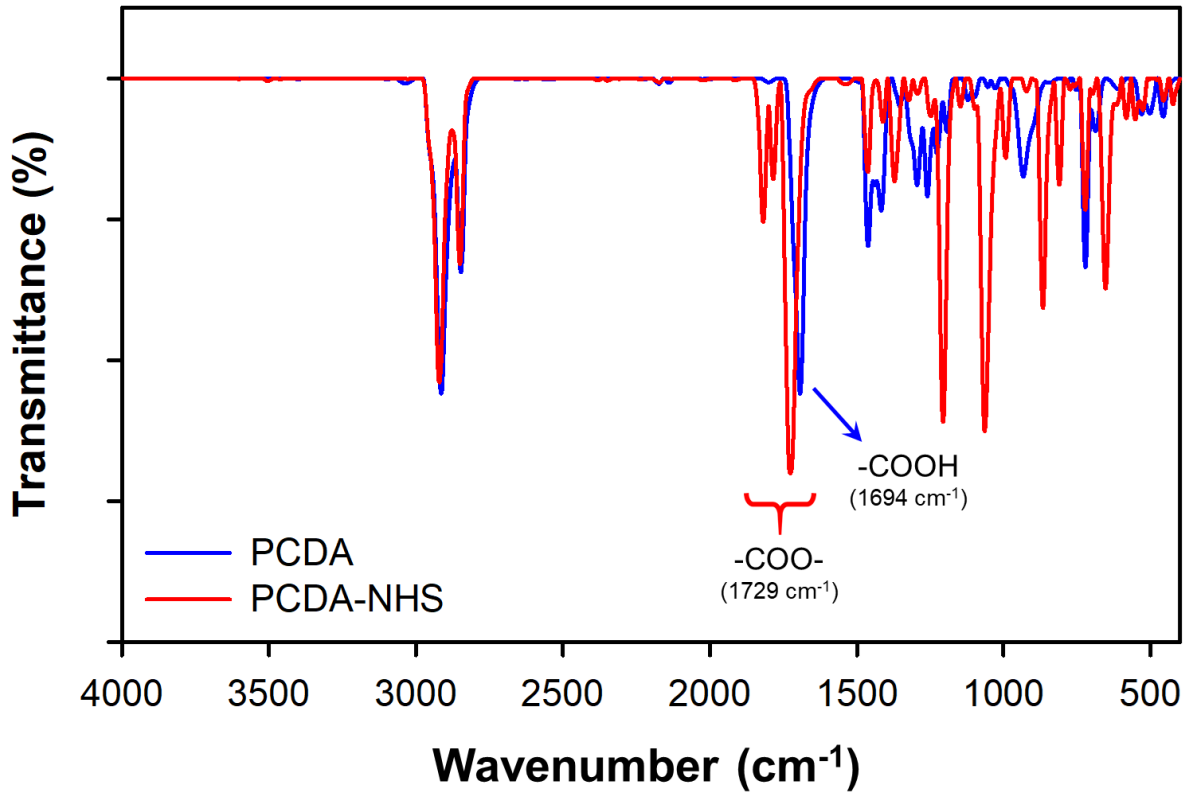


Fig. S1. FT-IR spectra of PCDA (blue) and PCDA-NHS (red).

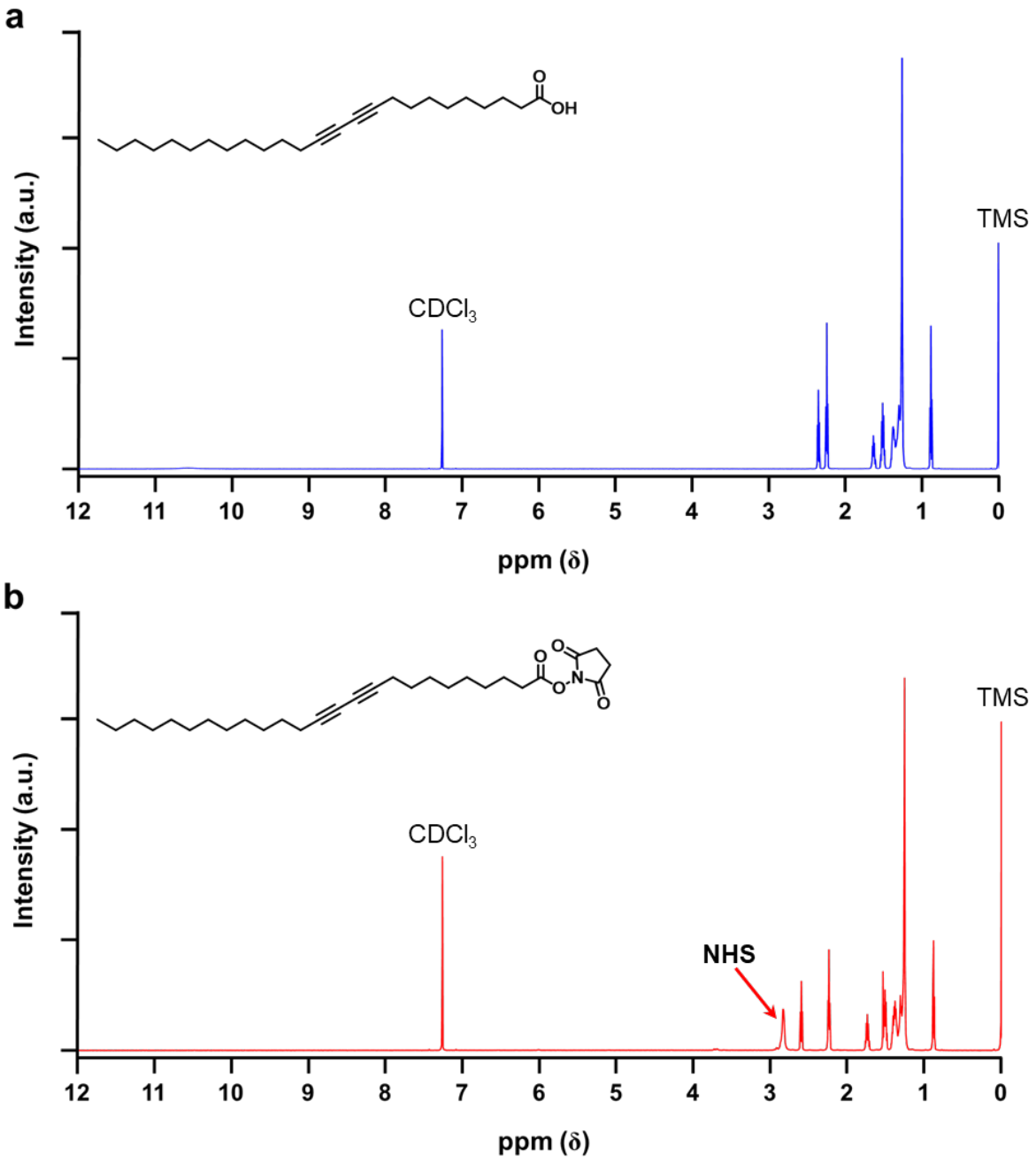


Fig. S2. ^{1}H-NMR spectra of (a) PCDA and (b) PCDA-NHS.

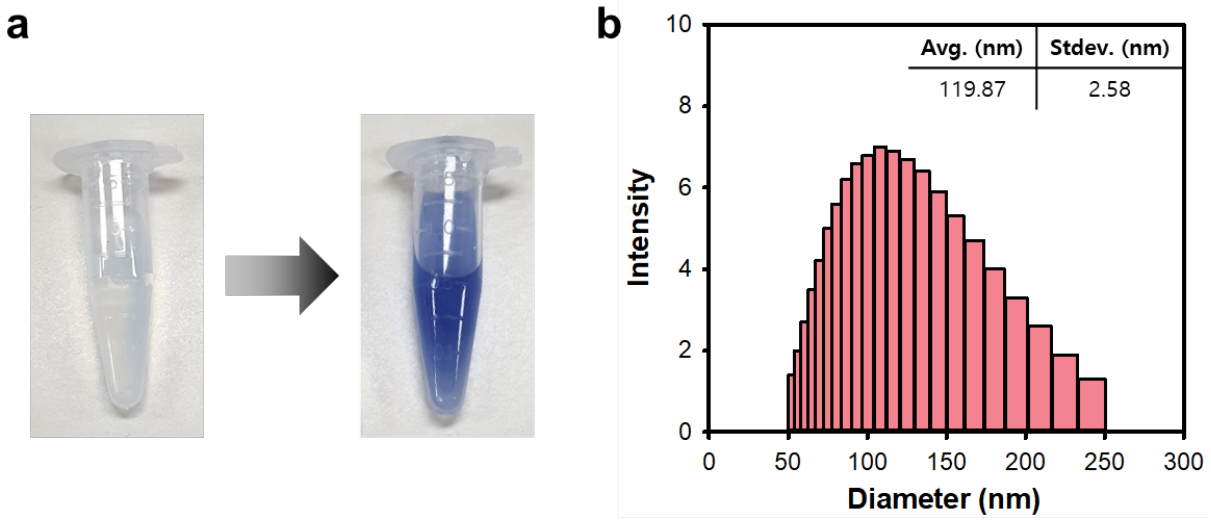


Fig. S3. (a) Photographs of 1 mL PDA liposome solution in 1.5-mL microtubes before (left) and after (right) UV irradiation for 10 min. The PDA liposomes turned blue after UV irradiation. (b) DLS graph of the PDA liposome showing their mean size (Avg.) and distribution (Stdev.: standard deviation).

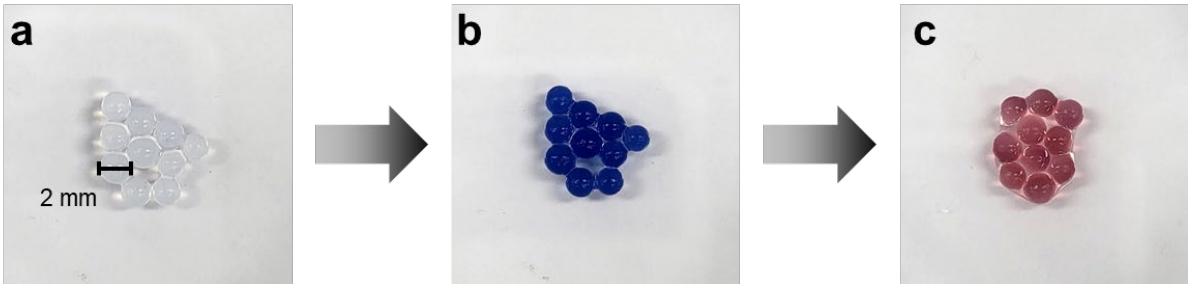


Fig. S4. Photographs of PDA-based hydrogel beads (a) before and (b) after UV irradiation, and (c) after incubation at 80 °C.

Fig. S5. Photograph of the experimental setup to detect BAs in the vapor phase using PDA-based hydrogel beads comprising. The beads were placed in a small amount of water to keep them from drying out. In this picture, cadaverine was used as an example BA.

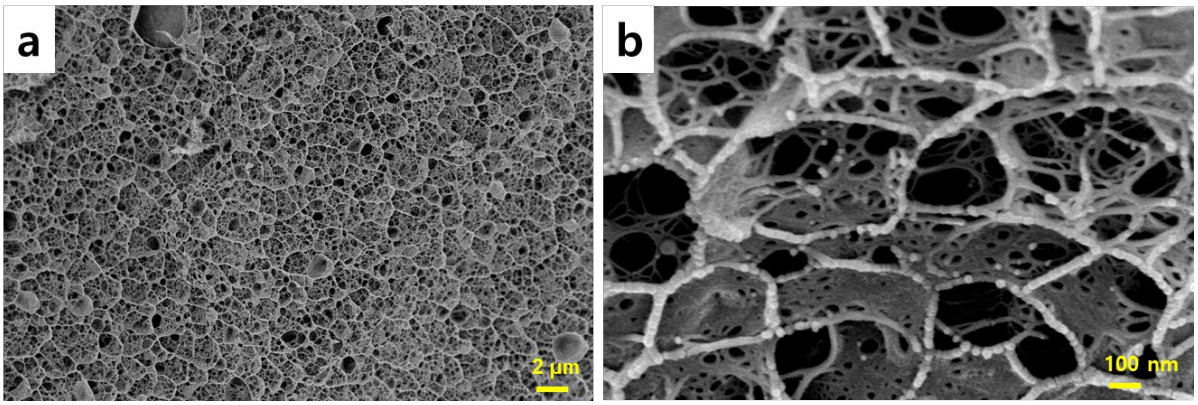


Fig. S6. Cryo-SEM images of the porous structures of PDA-based hydrogel beads (PCDA:PCDA-NHS molar ratio = 2:8) at (a) low and (b) high magnification.

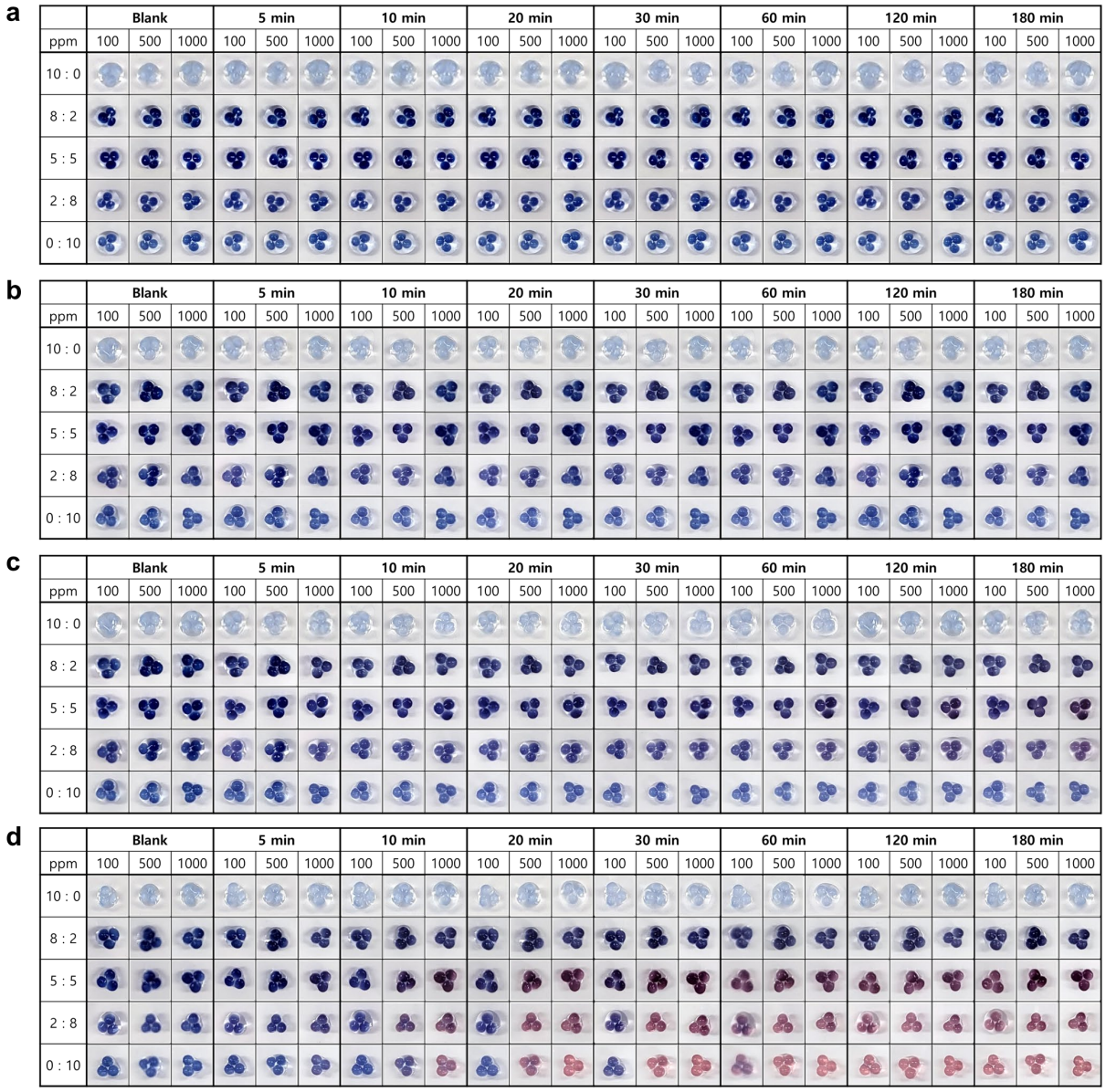


Fig. S7. Time-lapse photographs of the colorimetric response of PDA-based hydrogel beads prepared using different PCDA:PCDA-NHS molar ratios (first column) to various concentrations of vapor-phase BAs (a) cadaverine, (b) putrescine, (c) triethylamine, and (d) propylamine.

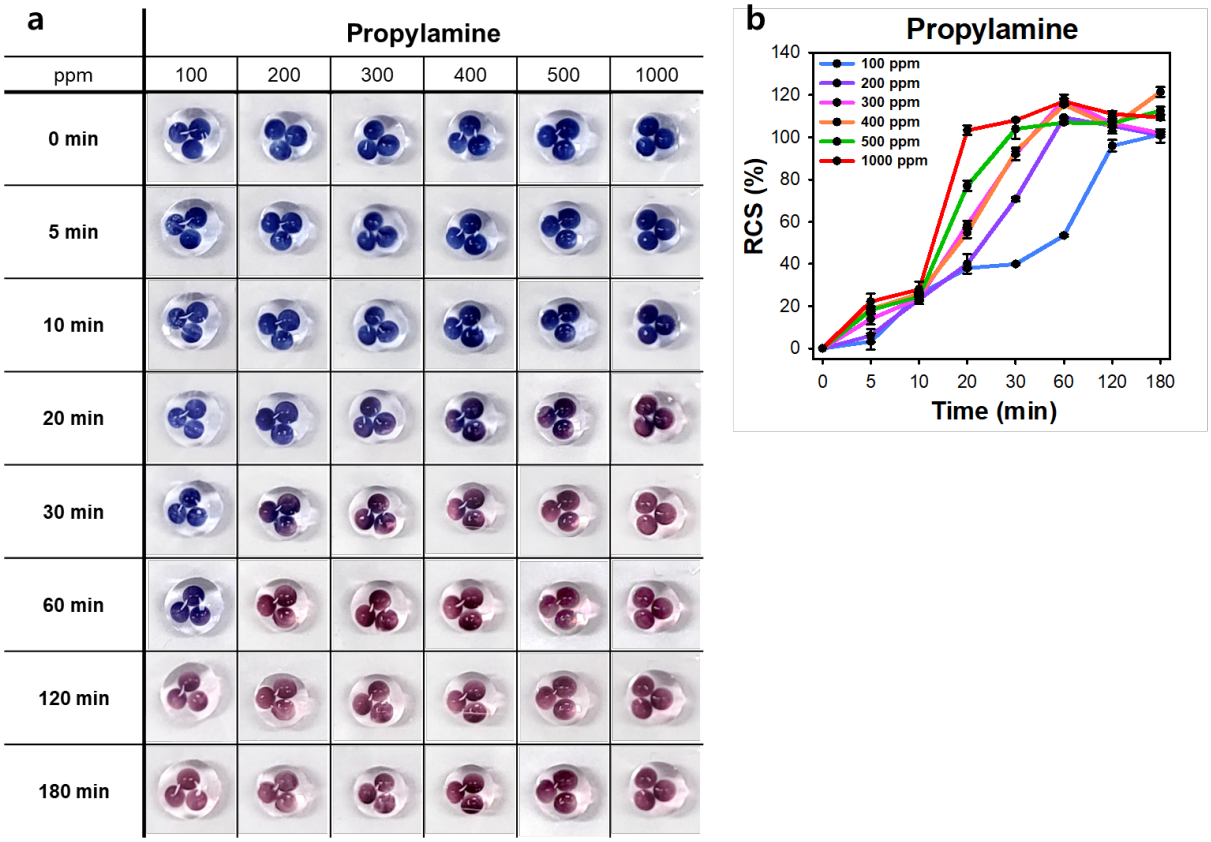


Fig. S8. (a) Colorimetric response of PDA-based hydrogel beads after exposure to vapor-phase propylamine at different exposure times and concentrations. (b) Time-dependent mean RCS corresponding to (a). Error bars represent the standard deviation of the three determinations.

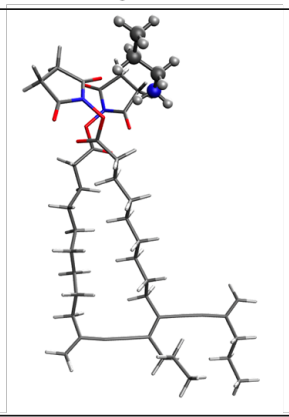
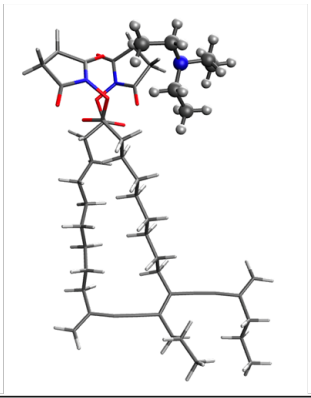
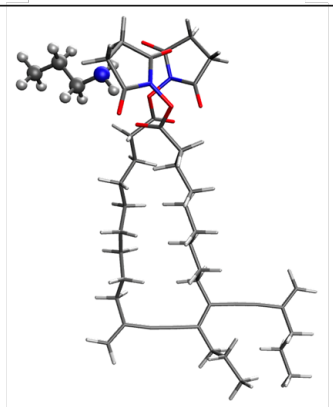
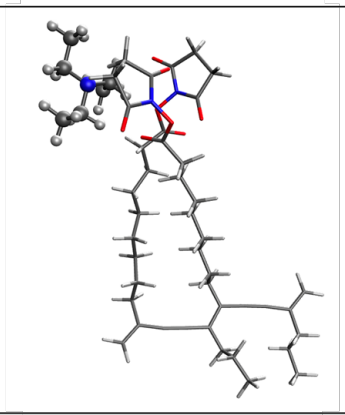
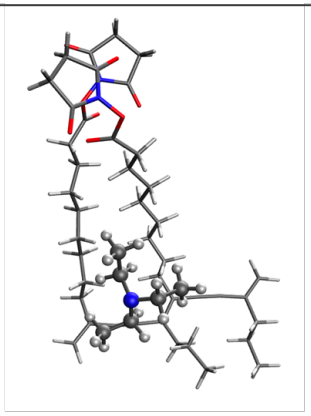
	Propylamine	Triethylamine
Sidechain P1		
Sidechain P2		
Backbone	**N/A**	

Fig. S9. Quantum chemical simulation of propylamine and triethylamine bonds to the side chain and backbone of PCDA-NHS, respectively. Sidechain P1, sidechain P2 and backbone indicate each different sites for PCDA-NHS.

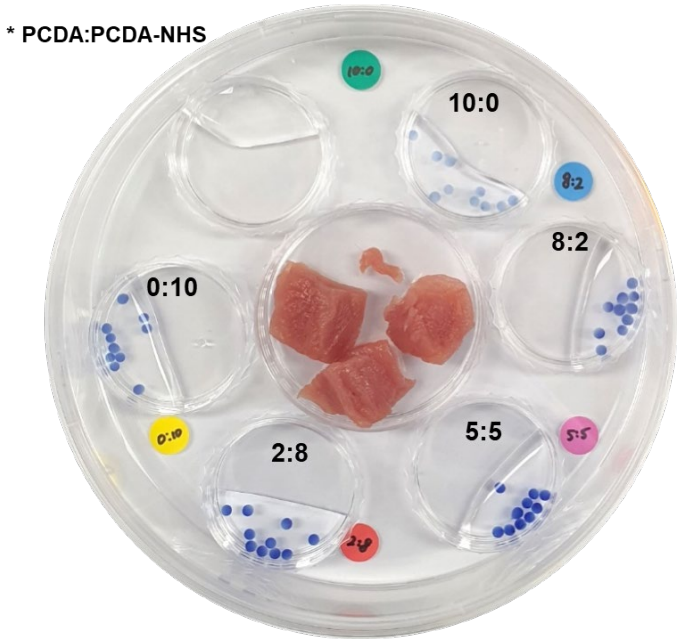


Fig. S10. Photograph of the experimental setup to detect BAs from spoiled meat using PDA-based hydrogel beads prepared using different PCDA:PCDA-NHS molar ratios. The hydrogel beads were placed in a small amount of water to prevent them from drying out.