

**Self-adhesive glutenin-based coating cross-linked by genipin for
suppressing microplastics shedding in harsh environments**

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Fig. S1 Glutenin solution (left) and PTG solution (right)

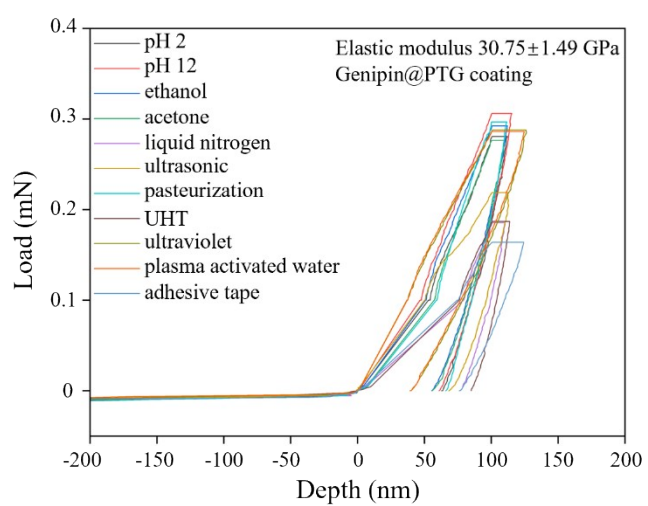


Fig. S2 Nanoindentation results of Genipin@PTG coatings treated under different conditions.

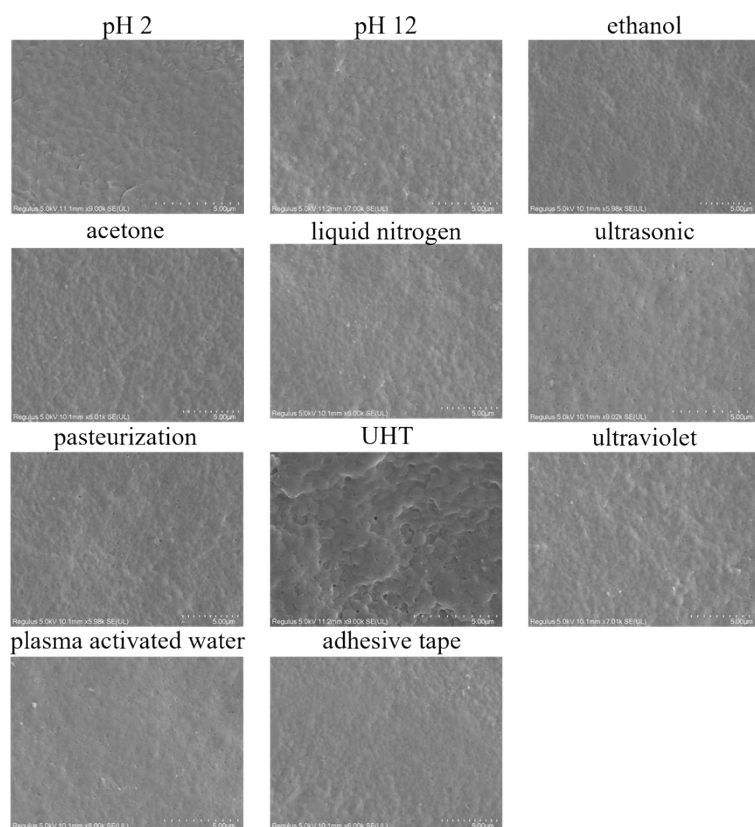


Fig. S3 SEM results of Genipin@PTG coatings treated under different conditions.

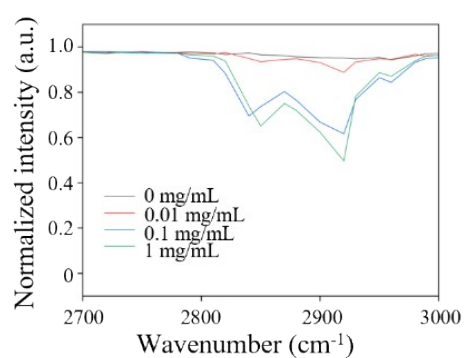


Fig. S4 Normalization results of FTIR spectrum in Fig. 4A.



Fig. S5 After glutenin phase transition incubation, photo of PET plastic partially washed with high-pressure water gun (left) and photo of PET plastic sheet washed clean with high-pressure water gun (right).

Table S1 Simulation conditions established based on different actual food environments for the study of microplastic shedding

Simulated category	Simulated components	Experimental conditions		Actual food	Corresponding practical processing
		Temperature (°C)	Duration (min)		
Neutral water	Ultrapure water	95	120	bottled water	pasteurization
Acidic water	4% acetic acid solution	95	120	apple juice	
Alkaline water	4% Na ₂ CO ₃ solution	95	120	soda drink	pasteurization
Acidic low oil	4 % acetic acid-50 % ethanol solution	95	120	dairy products	
					UHT sterilization

Acidic high oil	4 % acetic acid-ethanol solution	95	120	instant noodles	cook instant noodles
Alkaline high oil	4 % Na_2CO_3 - 90% ethanol solution	95	120	canned luncheon meat	UHT sterilization
High salt	5% NaCl solution	95	120	—	—
