

Figure S1 Observed surgical smoke generated by three electrocauteries when cutting skin tissues in animal experiment. (A) Surgical smoke generated by the high frequency electrotome; (B) Surgical smoke generated by the comparative PlasmaBlade; (C) Surgical smoke generated by the new surgical system that applies low-temperature plasma.

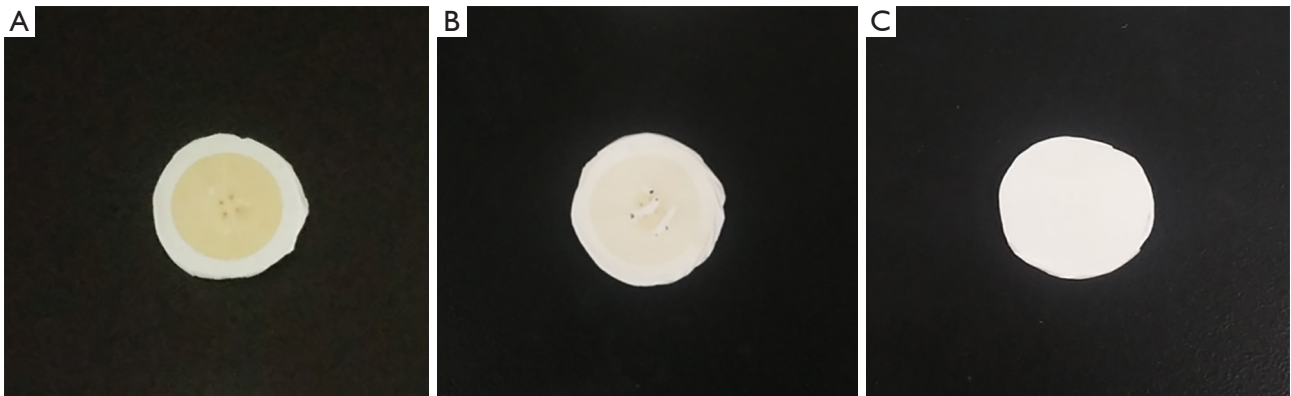


Figure S2 Filtration of surgical smoke particles after tissue dissection using three electrocauteriy systems in the *in vitro* experiment. (A) high frequency electrotome; (B) The comparative PlasmaBlade; (C) The new surgical system that applies low-temperature plasma.

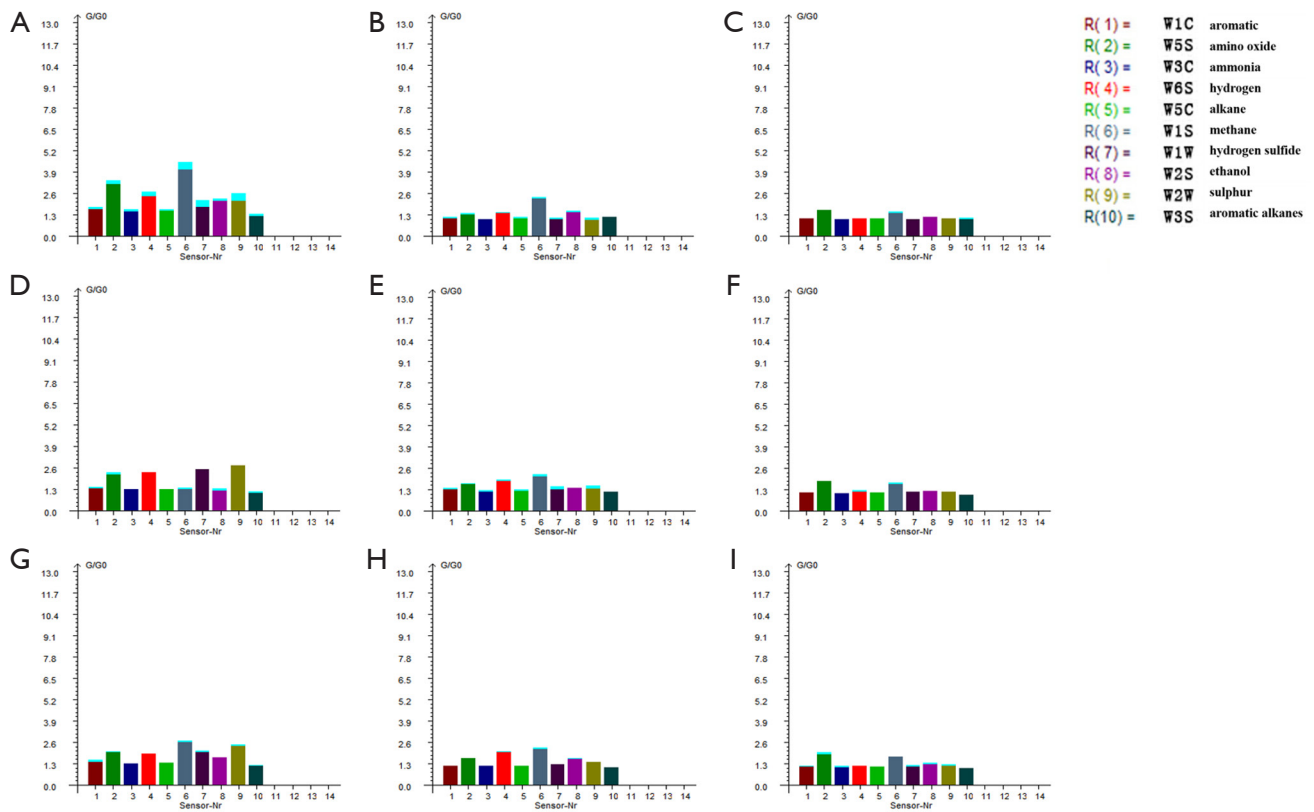


Figure S3 Smoke composition and sensor response intensity produced by nine cutting conditions of *in vivo* experiment (G/G0) n=3. (A) Liver dissected by ES; (B) liver dissected by PB; (C) liver dissected by NTS-100; (D) skin dissected by ES; (E) skin dissected by PB; (F) skin dissected by NTS-100; (G) muscle dissected by ES; (H) muscle dissected by PB; (I) muscle dissected by NTS-100. ES, high frequency electrotome; PB, PlasmaBlade; NTS-100, New surgical system that applies low-temperature plasma.

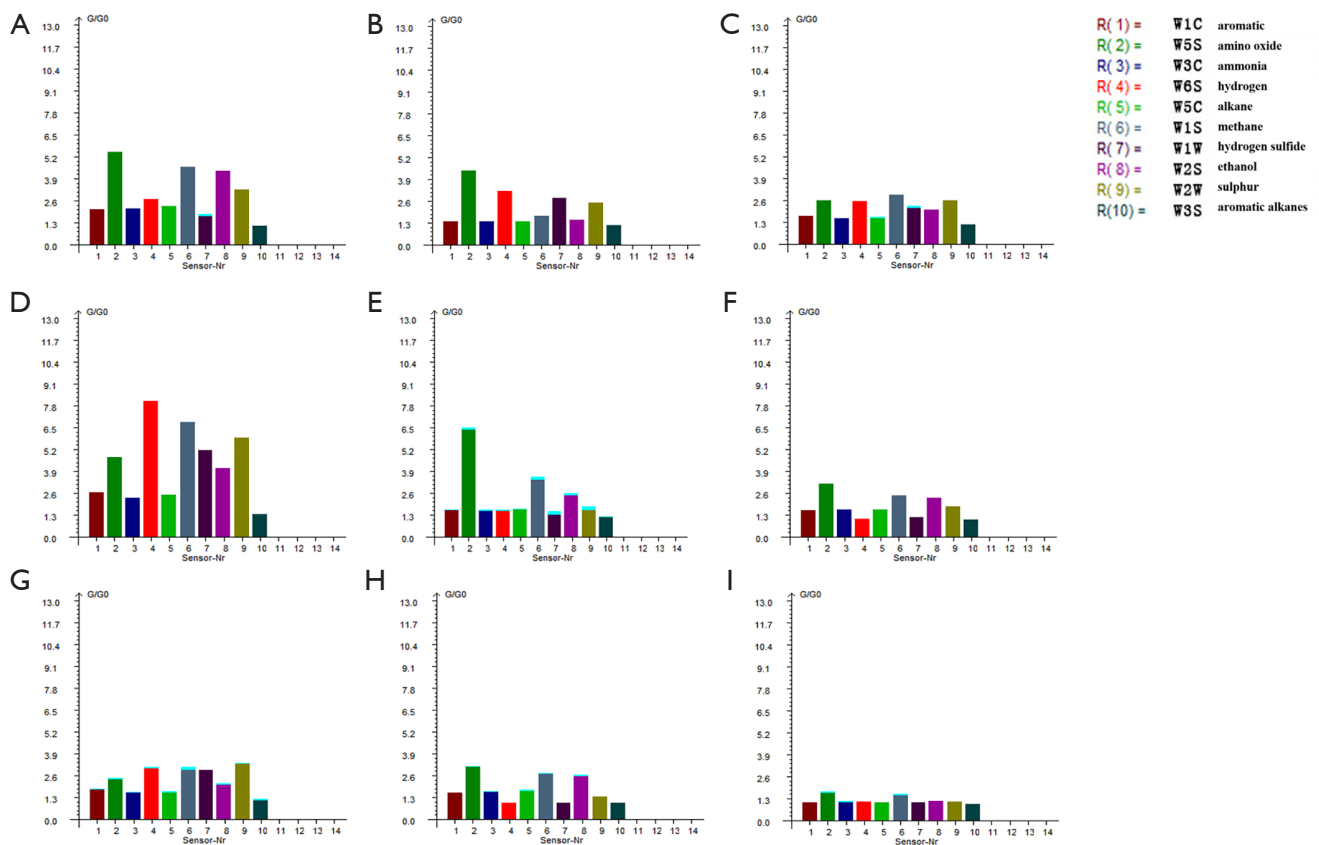


Figure S4 Smoke composition and sensor response intensity produced by nine cutting conditions of *in vitro* experiment (G/G0) n=3. (A) Liver dissected by ES; (B) liver dissected by PB; (C) liver dissected by NTS-100; (D) skin dissected by ES; (E) skin dissected by PB; (F) skin dissected by NTS-100; (G) muscle dissected by ES; (H) muscle dissected by PB; (I) muscle dissected by NTS-100. ES, high frequency electrotome; PB, PlasmaBlade; NTS-100, New surgical system that applies low-temperature plasma.