SUPPORTING INFORMATION

A facile approach to improve the spray time and stability of paper spray ionization mass spectrometry with a Teflon tube

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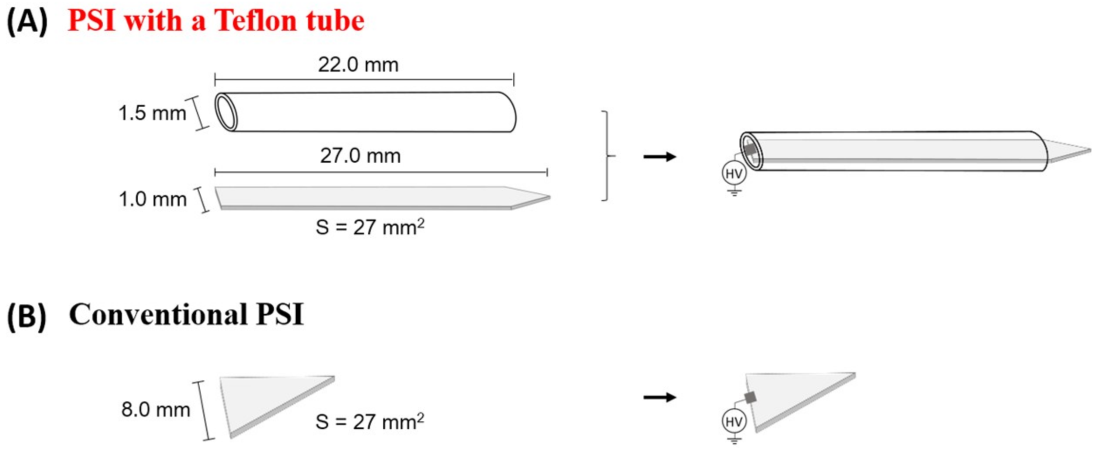

Figure S1. The schematic drawing of PSI with a Teflon tube and conventional PSI. (A) PSI with a Teflon tube was simply made up of a paper inserted into the Teflon tube. The paper was cut into rectangle shape (1 mm*27 mm, area size of 27 mm^2) with a front tip by a paper cutter. The Teflon tube was 22 mm length with inner diameter of 1.5 mm. (B) The paper was made as regular triangle shape (with length of side of 8 mm and area size of 27 mm^2) by craft punch.

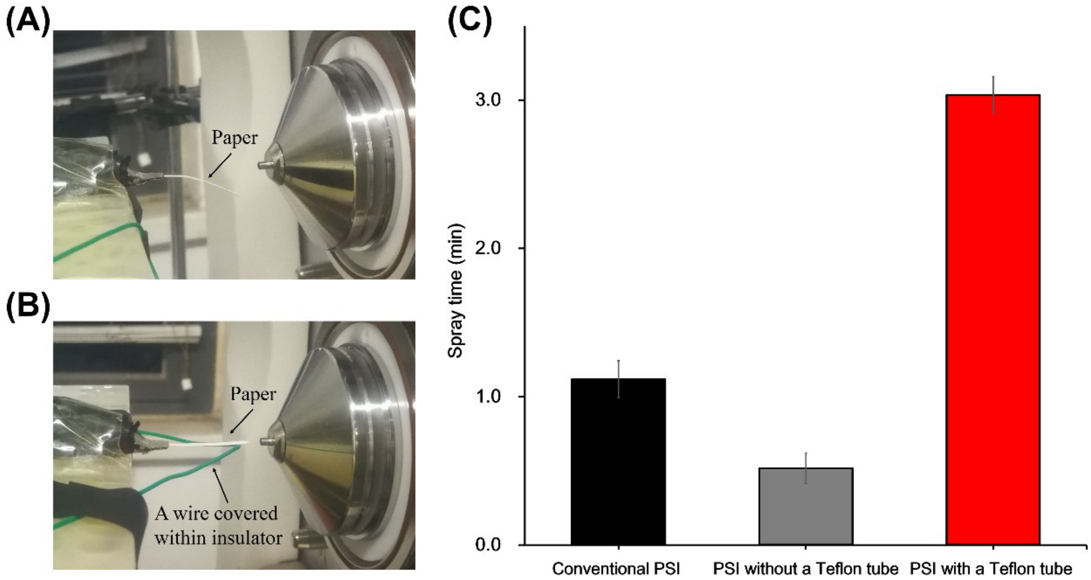

Figure S2. (A) The photo of the device of PSI without a Teflon tube (rectangular paper in the absence of the Teflon container). (B) The photo of improved device of PSI without a Teflon tube (rectangular paper in the absence of the Teflon container). (C) The spray time was recorded for conventional PSI (triangular paper), PSI without a Teflon tube (rectangular paper in the absence of the Teflon container), and PSI with a Teflon tube (rectangular paper inside a Teflon tube).

Additional Study Details

The influences of geometry shape of paper on the increase ratio of spray time

Influence of the change in paper geometry on the spray time was investigated. The paper was made into devices as conventional PSI (triangular paper), PSI without a Teflon tube (rectangular paper in the absence of the Teflon container), and PSI with a Teflon tube (rectangular paper inside a Teflon tube). Then equal volume of methanol (20 μL) was applied to all three devices. For the PSI without a Teflon tube, it should be pointed out that the rectangular paper would collapse and the solvent would drop from the paper when 20 μL solvent was applied as shown in Figure S2 (A). Therefore, an improved device was made to enable rectangular paper to be used for MS analysis. A wire covered within insulator (outer diameter of 1.3 mm) was introduced to support the rectangular paper as shown in Figure S2 (B). The spray time was recorded using different devices as shown in Figure S2 (C). As for rectangular paper, the spray time of PSI without a Teflon tube was shorter than that in conventional PSI. It might attribute to the larger probability that the paper turned to dry, because the rectangular paper was of longer length. However, the spray time of PSI with a Teflon tube was observed to be three times longer than that in conventional PSI, because the paper was inside a Teflon tube.

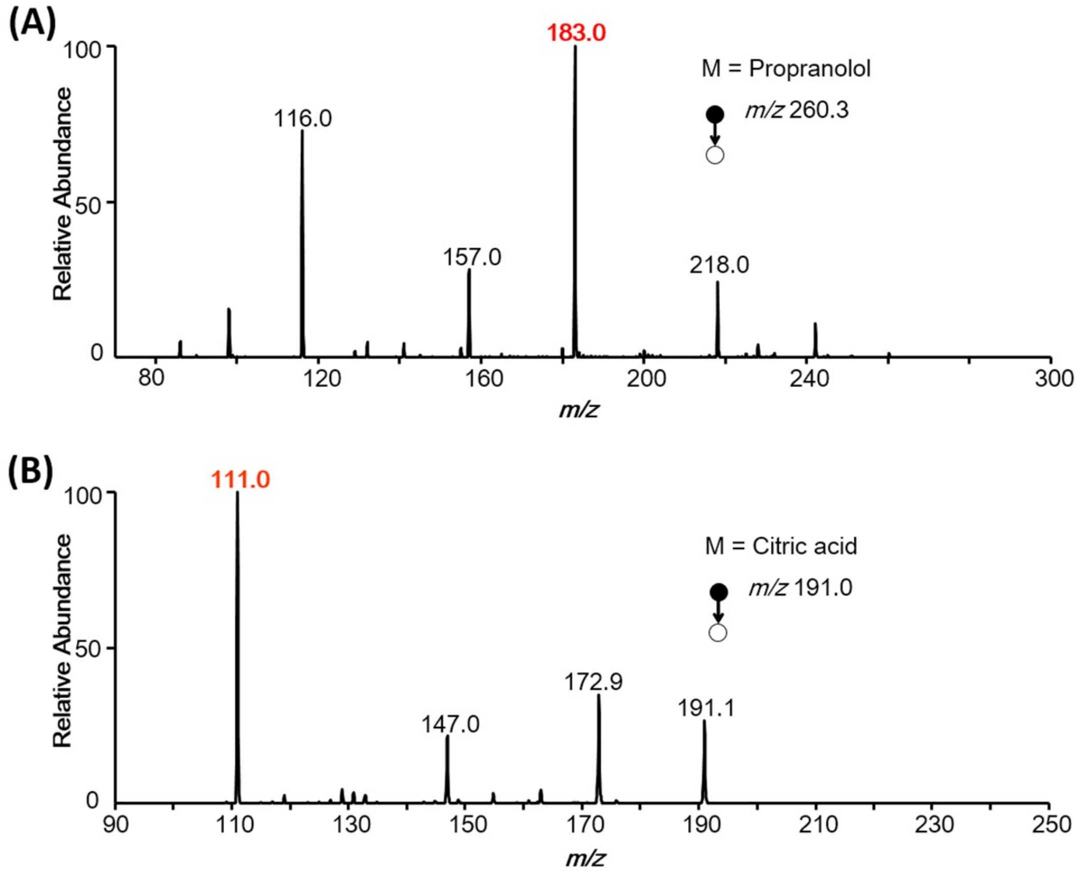

Figure S3. (A) MS/MS spectrum of propranolol (*m/z* 260.3). (B) MS/MS spectrum of citric acid (*m/z* 191.1).

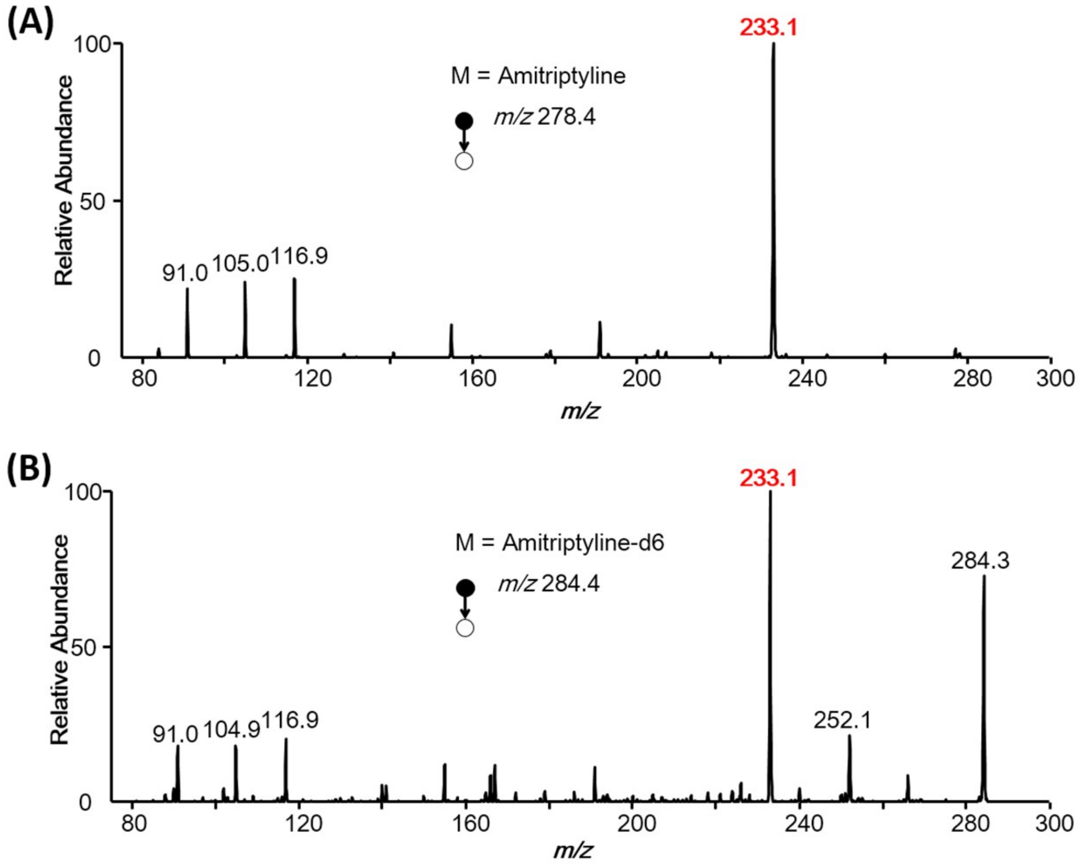

Figure S4. (A) MS/MS spectrum of amitriptyline (*m/z* 278.4). (B) MS/MS spectrum of amitriptyline-d6 (*m/z* 284.4).

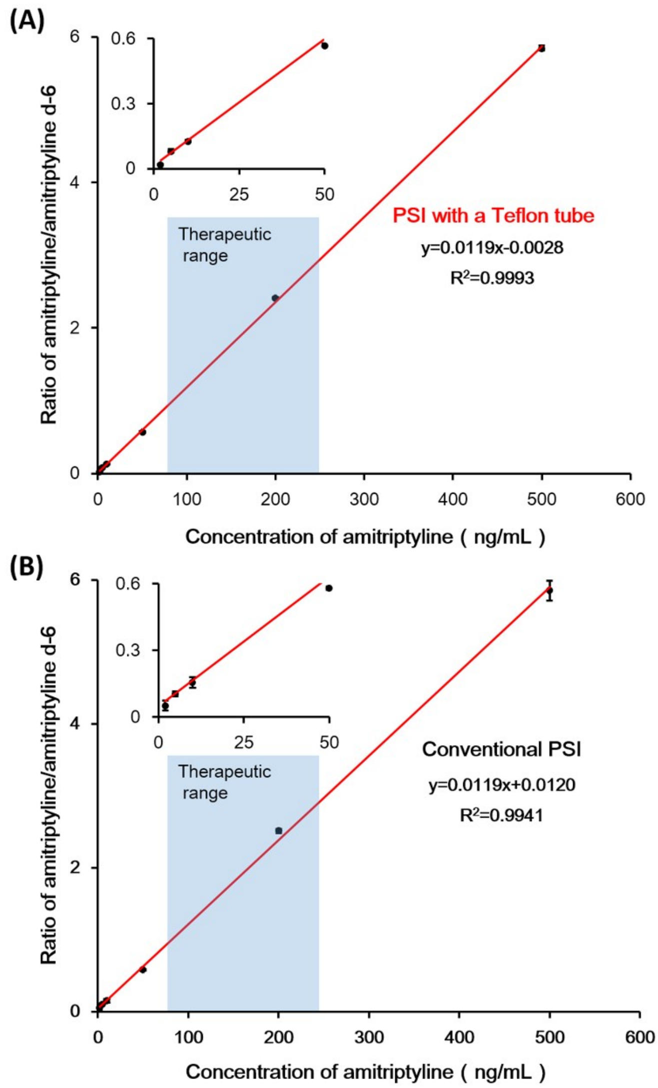

Figure S5. Calibration curves for amitriptyline (50 ng/mL amitriptyline-6 as internal standard) in the rabbit whole blood samples by (A) PSI with a Teflon tube and (B) conventional PSI. Blood sample (1 μL) was loaded on paper and 20 μL MeOH was applied both in PSI with a Teflon tube and conventional PSI. The insets are magnifications at lower range of calibration curves.

Table S1. Analytical performances of PSI with a Teflon tube and conventional PSI for amitriptyline analysis in the rabbit whole blood samples

	Linear dynamic range (ng/mL)	Limit of detection[a] (ng/mL)	R^2
PSI with a Teflon tube	2-500	0.22	0.9993
Conventional PSI	2-500	1.40	0.9941

[a]LOD was calculated as the amount at which the S/N ratio was >3