pulse of laser light so that at most one picogram of sample material is desorbed in step (b) with every pulse of laser light.

3. The method according to claim **1**, wherein step (a) comprises adjusting the laser so that a duration of each pulse of laser light is shorter than 500 picoseconds.

4. The method according to claim **1**, wherein the diameter of the at least one spot is at most ten micrometers.

5. The method according to claim **1**, wherein step (b) comprises simultaneously generating a plurality of spots from each pulse of laser light.

6. The method according to claim **1**, wherein step (a) comprises producing the pulses of laser light with a repetition rate of at least 20 kilohertz.

7. The method according to claim **1**, further comprising, after step (b) collecting generated analyte ions in an ion funnel located in front of the sample and transmitting the collected ions additional apparatus for further processing.

8. The method according to claim **1**, further comprising, after step (b) collecting generated analyte ions in a multipole rod system located in front of the sample and transmitting the collected ions additional apparatus for further processing.

9. The method according to claim **1**, further comprising, after step (b) analyzing the generated ions with a mass spectrometer.

10. The method according to claim **9**, wherein the generated ions are analyzed with a time-of-flight mass spectrometer.

11. The method according to claim **1**, further comprising, after step (b) analyzing the generated ions with an ion mobility spectrometer.

12. The method according to claim **1**, wherein the sample is a histologic thin section.

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