

**Table S1.** SRM transitions (Q1 and Q3 m/z), ionization mode (PI for positive ion and NI for negative ion), retention time and mass spectrometry parameters: Q1 Pre Bias, CE, Q3 Pre Bias. The internal standard (IS) coupled with each analyte is reported in the last column.

| Compound                  | Ionization mode | RT (min) | Q1 (m/z) | Q3 (m/z)    | Q1 Pre Bias (V) | CE (V)      | Q3 Pre Bias (V) | IS                        |
|---------------------------|-----------------|----------|----------|-------------|-----------------|-------------|-----------------|---------------------------|
| 6-MAM                     | PI              | 2.60     | 328      | 165/211/193 | -17/-23/-17     | -45/-28/-30 | -30 / -25 / -22 | 6-MAM-D3                  |
| 6-MAM-D3                  | PI              | 2.60     | 331      | 165/211/193 | -26/-18/-24     | -42/-28/-29 | -18/-23/-22     | -                         |
| Amphetamine               | PI              | 2.11     | 136      | 91/65/119   | -28/-10/-24     | -23/-37/-13 | -18/-12/-23     | Amphetamine -D6           |
| Amphetamine -D6           | PI              | 2.11     | 142      | 93/125/94   | -10/-29/-10     | -22/-15/-25 | -10/-24/-11     | -                         |
| Cocaine                   | PI              | 3.62     | 304      | 182/82/105  | -14/-27/-20     | -13/-32/-36 | -21/-28/-14     | Cocaine-D3                |
| Cocaine-D3                | PI              | 3.62     | 307      | 185/77/91   | -14/-23/-10     | -20/-55/-48 | -20/-26/-19     | -                         |
| Heroin                    | PI              | 3.46     | 370      | 165/268/58  | -11/-27/-24     | -53/-27/-32 | -29/-22/-13     | Heroin-D3                 |
| Heroin-D3                 | PI              | 3.46     | 373      | 165/271/331 | -25/-18/-19     | -50/-29/-28 | -30/-30/-24     | -                         |
| GBL                       | PI              | 1.42     | 87       | 45/43       | -16/-15         | -15/-28     | -18/-17         | GHB-D6                    |
| GHB                       | PI              | 0.75     | 105      | 87/45/43    | -18/-19/-20     | -10/-20/-15 | -17/-18/-17     | GHB-D6                    |
| GHB-D6                    | PI              | 0.75     | 111      | 93/49       | -18/-20         | -10/-15     | -17/-17         | -                         |
| ketamine                  | PI              | 3.33     | 238      | 125/220/179 | -30/-25/-28     | -29/-15/-18 | -23/-16/-21     | MDMA-D3                   |
| LSD                       | PI              | 3.92     | 324      | 223/207/208 | -23/-23/-23     | -23/-44/-29 | -25/-23/-23     | LSD-D3                    |
| LSD-D3                    | PI              | 3.92     | 327      | 226/210/211 | -23/-16/-17     | -26/-48/-35 | -25/-23/-23     | -                         |
| MDMA                      | PI              | 2.66     | 194      | 163/105/135 | -24/-23/-24     | -13/-25/-20 | -29/-19/-25     | MDMA-D3                   |
| MDMA-D3                   | PI              | 2.66     | 197      | 163/105/135 | -24/-21/-23     | -15/-25/-23 | -18/-20/-26     | -                         |
| Methamphetamine           | PI              | 2.43     | 150      | 91/65/119   | -29/-10/-29     | -22/-39/-15 | -30/-12 /-30    | Methamphetamine -D5       |
| Methamphetamine -D5       | PI              | 2.43     | 155      | 92/91/121   | -29/-11/-30     | -20/-16/-16 | -30/-10/-23     | -                         |
| Morphine                  | PI              | 1.80     | 286      | 152/201/128 | -14/-10/-17     | -55/-27/-54 | -28/-21/-21     | Morphine -D3              |
| Morphine -D3              | PI              | 1.80     | 289      | 152/201/165 | -21/-30/-29     | -55/-27/-42 | -28 / -22 / -30 | -                         |
| trans- $\Delta$ 9-THC     | PI              | 4.68     | 315      | 193/123/259 | -16/-15/-16     | -25/-34/-20 | -21 / -23 / -28 | trans- $\Delta$ 9-THC -D3 |
| THCA                      | NI              | 4.76     | 357      | 313/245/191 | 11/13/14        | 24/31/33    | 14 / 11 / 19    | trans- $\Delta$ 9-THC -D3 |
| trans- $\Delta$ 9-THC -D3 | PI              | 4.68     | 318      | 196/123/262 | -12/-12/-24     | -25/-35/-22 | -21 / -24 / -28 | -                         |