**Supplementary Information**

Table S1 Data from fluorescein assay: DF values for inserts (average overall all eight inserts) and QCM.

|  |  |  |
| --- | --- | --- |
| Participant | DF Inserts 1-8 | DF QCM |
|  | Mean | SD | SEM | N | Mean | SD | SEM | N |
| AMI | 0.644 | 0.129 | 0.053 | 6 | 0.439 | 0.124 | 0.051 | 6 |
| RIVM | 0.865 | 0.081 | 0.027 | 9 | 0.736 | 0.050 | 0.017 | 9 |
| SU | 0.509 | 0.080 | 0.033 | 6 | 0.630 | 0.117 | 0.048 | 6 |
| BASF | 0.850 | 0.021 | 0.009 | 6 | 0.696 | 0.104 | 0.042 | 6 |
| LIST | 0.392 | 0.086 | 0.035 | 6 | 0.320 | 0.095 | 0.039 | 6 |
| HMGU | 0.646 | 0.151 | 0.087 | 3 | 0.468 | 0.159 | 0.092 | 3 |
| STAMI | 0.537 | 0.021 | 0.012 | 3 | 0.888 | 0.191 | 0.110 | 3 |

Table S2 Data from fluorescein assay: Deposition in ng/cm2 on the QCM (there both spectrofluorimetry and the QCM signal itself) and in the inserts (average over all eight inserts)

|  |  |  |  |
| --- | --- | --- | --- |
| Participant | by fluorescence on QCM | by QCM signal | by fluorescence in inserts |
|  | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N |
| AMI | 6556 | 1297 | 470.5 | 6 | 8563 | 1297 | 531 | 6 | 9606 | 1235 | 504 | 6 |
| RIVM | 11008 | 1432 | 299.5 | 9 | 13590 | 1432 | 723.5 | 9 | 12902 | 793 | 542 | 9 |
| SU | 9406 | 618 | 634.5 | 6 | 8940 | 618 | 252 | 6 | 7592 | 1867 | 247 | 6 |
| BASF | 10788 | 332 | 648 | 6 | 11282 | 332 | 135.5 | 6 | 12678 | 419 | 114 | 6 |
| LIST | 4773 | 818 | 263 | 6 | 5027 | 818 | 334 | 6 | 5847 | 430 | 205 | 6 |
| HMGU | 6992 | 1765 | 641 | 3 | 7734 | 1765 | 1019 | 3 | 9635 | 480 | 684 | 3 |
| STAMI | 13258 | 759 | 1460 | 3 | 6509 | 759 | 438 | 3 | 8010 | 510 | 49 | 3 |

Table S3 QCM data on DQ12 deposition (ng/cm2). In the lowest row, the sham offset was subtracted and the SD and SEM were added according to the laws of error propagation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Conc. (µg/mL) | AMI | RIVM | SU | BASF | LIST | HMGU | STAMI |
|  |  | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N |
| 0 (sham) |  | 44.9 | 51 | 20.82 | 6 | 41.1 | 3 | 1.73 | 3 | 37.5 | 16 | 8.00 | 4 | 87 | 13 | 6.50 | 4 | 225 | 2 | 1.15 | 3 | 197 | 48 | 24.0 | 4 | 19 | 27 | 15.6 | 3 |
| 125 |  | 185.2 | 19 | 7.76 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 250 |  | 258.3 | 19 | 7.76 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 500 |  | 516 | 32 | 13.06 | 6 | 173.9 | 11 | 6.35 | 3 | 379 | 22.5 | 45.1 | 4 | 481 | 71 | 35.5 | 4 | 523 | 118 | 59.0 | 4 | 499 | 20.7 | 10.4 | 4 | 472 | 53 | 30.6 | 3 |
| 500  (-sham) |  | 471 | 60 | 25.6 | 6 | 132 | 11.4 | 6.6 | 3 | 444 | 72.8 | 36.4 | 4 | 394 | 72.2 | 36.1 | 4 | 298 | 118 | 59.0 | 4 | 302 | 52.3 | 26.1 | 4 | 453 | 59.5 | 34.3 | 3 |

Table S4 Data on TiO2 NM-105 deposition

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Conc. (µg/mL) | AMI | RIVM | SU | BASF | LIST | HMGU | STAMI |
|  |  | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N | Mean | SD | SEM | N |
| 0 (sham) |  | 50.1 | 36 | 14.7 | 6 | 41.1 | 3 | 1.73 | 3 | 37.5 | 16 | 8.00 | 4 | 87 | 13 | 5.31 | 6 | 153 | 43.5 | 25.1 | 3 | 222 | 57.4 | 28.70 | 4 | 26 | 16 | 9.24 | 3 |
| 125 |  | 193 | 46 | 18.8 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 250 |  | 218 | 42 | 17.2 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 500 |  | 395 | 121 | 49.4 | 6 | 189 | 31 | 17.9 | 3 | 302 | 85 | 42.5 | 4 | 506 | 7 | 2.86 | 6 | 220 | 51.5 | 25.7 | 4 | 430 | 24.2 | 12.10 | 4 | 244 | 34 | 19.6 | 3 |
| 500  (-sham) |  | 345 | 126 | 51.5 | 6 | 148 | 31.1 | 18.0 | 3 | 264 | 86.5 | 43.2 | 4 | 419 | 14.8 | 6.0 | 6 | 67.0 | 67.4 | 33.7 | 4 | 208 | 62.3 | 31.1 | 4 | 218 | 37.6 | 21.7 | 3 |

B

A

Figure 1 QCM signal for consecutive nebulizations of 500 µg/ml DQ12 in VITROCELL® Cloud12 device performed by AMI. A: Two nebulizations resulted in a deposition of 835 ng/cm2, B: The nebulizations resulted in a deposition of 1522 ng/cm2. For a single nebulization the mean deposition was 515 nm/cm2 (curve not shown).