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|  | **Process description** | **Variable** | **PDF(1)** | **Results** |
| (a) | Randomness (cell encapsulation) | *n,* *ε, α* | Based on normal distribution (LLN) | - number of samples: 10 × 10 |
| - sampling volume fraction(2): 0.76% |
| - confidence level: 90% |
| - tolerance: 15% |
| (b) | Number of cell containing droplets (cell encapsulation) | *Xdrop* | Binomial distribution | *- (\*) f(P)* = 27 ~ 87% |
| - cell loading concentration |
| - cell volume fraction(3) |
| Number of cells in a droplet (cell distribution) | *Xcell* | Binomial distribution, Poisson distribution | - *f(λ)* = 0.4 ~ 2.2 |
| - cell loading concentration |
| Number of target cells in a droplet (target cell distribution) | *Xtarget cell* | Poisson distribution | *- f(λ)* = 0.03 ~ 0.95 |
| - cell loading concentration |
| - percentage of target cells |
| Number of single target cell containing droplets (target droplet distribution) | *Xsingle target cell drop* | Normal distribution | *- f(λ)* = 0.03 ~ 0.95, P = 27 ~ 87% |
| - cell concentration |
| - percentage of target cells |
| (c) | CLT for SRS(4) (target droplet selection) | *ε, α, Copt, F%* | Based on normal distribution (CLT for SRS) | - confidence level: 90% |
| - tolerance: 15% |
| - optimum cell concentration: 1.0 × 105 |
| - target cell fraction(5): 10 ~ 50% |

(\*)*f(x)*: functions for variable *X*

(\*\*) Sampling number: n ≥ pq/ε2α, where, p = 0.6, q = 0.4 (ref. 41)

(1)PDF: Probability Distribution Function

(2)Sampling volume fraction (%) = total sample set volume / entire volume (100 µl) × 100 = 0.76%

(3)Cell volume fraction = number of cells × cell volume / droplet volume

(4)CLT (Central Limit Theorem) and SRS (Simple Random Sampling)

(5)Target cell fraction = number of target cells / number of whole cells