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Supplementary Information

The effect of microchannel shape on droplet formation for nanoparticle synthesis

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To model the system's essence, the main parameters must be defined. By selecting the symmetric two-dimensional geometry, the stable system and the main module start the process by applying the boundary conditions (Table 1S), and the information is obtained if the termination condition of the algorithm is met. Otherwise, the operational parameters must be changed. The flowchart in question is shown in Figure. 1S.

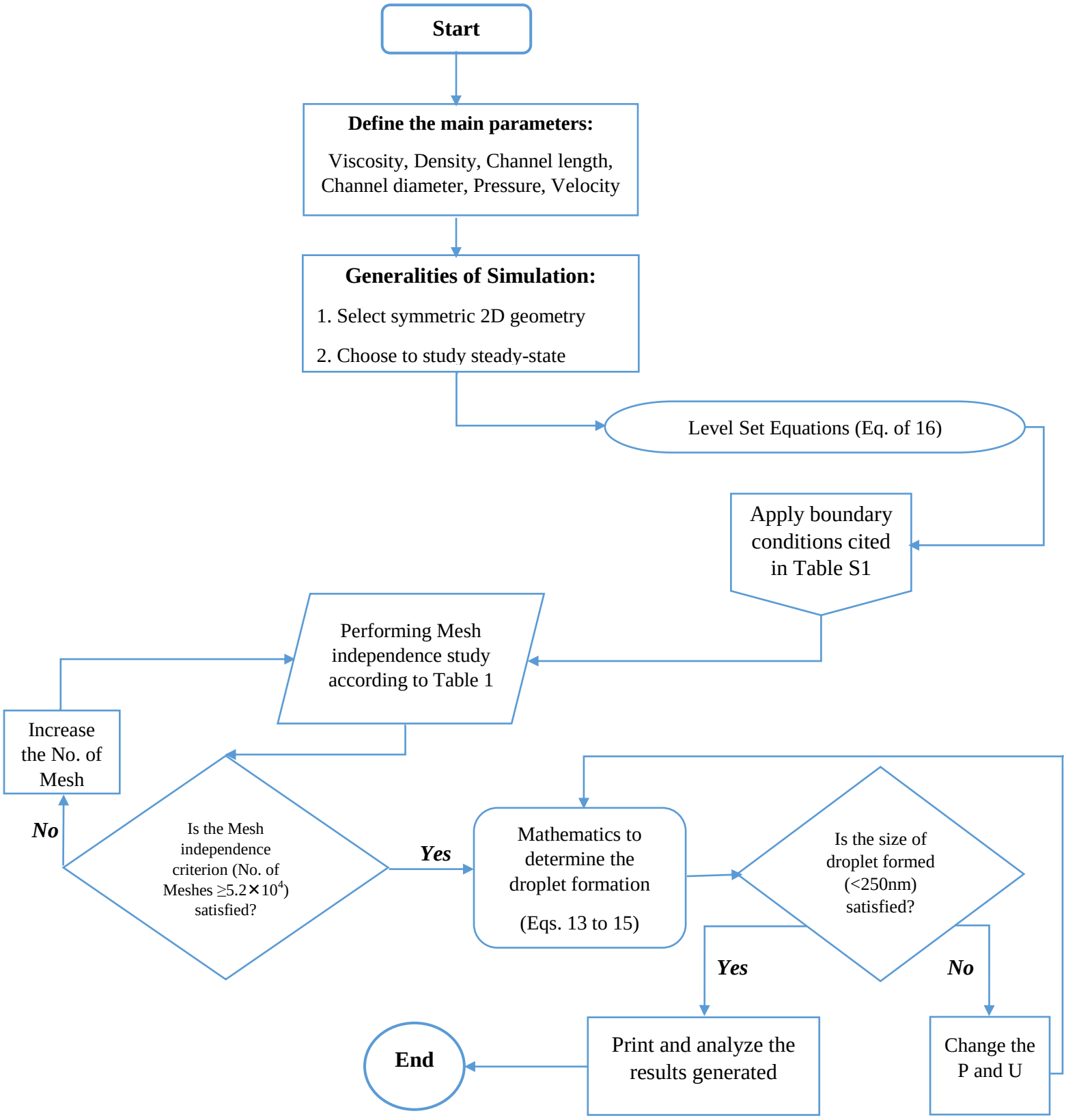

Figure. S1: Flowchart of simulation steps used in this research.

Determining the correct boundary conditions for the desired geometry is one of the basic principles of simulation. Table 1s examines the boundary conditions of the desired geometry.

Table S1: The computational region's boundary conditions are illustrated.

Level Set (Eq. (16) **)**	**Flow Field (**Eqs. (13), (14) and (15)**)**
Impervious	non-slip $u = 0$
Volume Phase $\varphi = \varphi_0$ Volume Phase $\varphi = \varphi_0$	no external pressure $P = 0$ no external pressure $p = 0$
zero normal flux	slip boundary

According to Figure 4, which was a comparison of the data of the present study with the study of Li et.al, according to the equations S1 and S2, it shows the highest and the lowest value of deviation from the data of Li et al.

$$\text{Max}\% = \frac{1.00004 - 0.999405}{1.00004} * 100 = 0.064\% \quad \text{(S1)}$$

$$\text{Min}\% = \frac{0.997965 - 0.997915}{0.997965} * 100 = 0.005\% \quad \text{(S2)}$$