

Two hours before metabolite extraction, the cell culture medium was replaced with fresh medium. Single cell and cell cluster states were collected and centrifuged at $800 \times g$ for 3 min to remove culture media. Then, the cells were resuspended in 1 mL of precooled PBS (4°C) and transferred into a 1.5 mL eppendorf tube. After removing supernatant by centrifugation at $800 \times g$ for 3 min, the tube containing cell pellet was immediately incubated in liquid nitrogen for 1 min to quench enzyme activity and stop the degradation of metabolites.