Supplementary Information for

Macrophage-Mediated Delivery of Microcapsules for Enhanced Photodynamic Therapy of Colon Cancer

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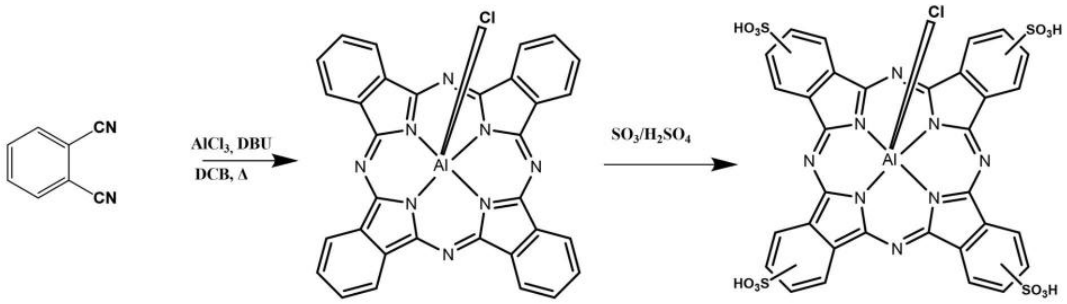

Fig. 1S. Synthesis scheme of PS.

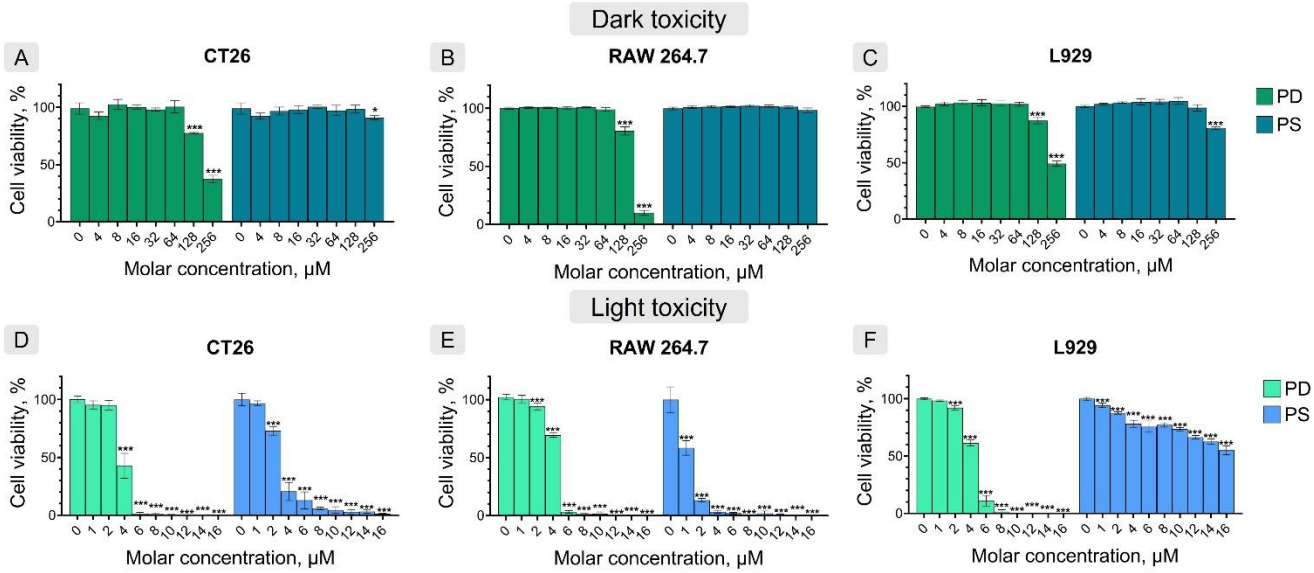

Fig. 2S. Dark toxicity (A, B, C) and light toxicity (D, E, F) assessments of photosensitizers PD and PS. Data are presented as mean ± SD, n = 5, (*), (**), and (***) indicate groups that are significantly different from control (0 μM) with $p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively.

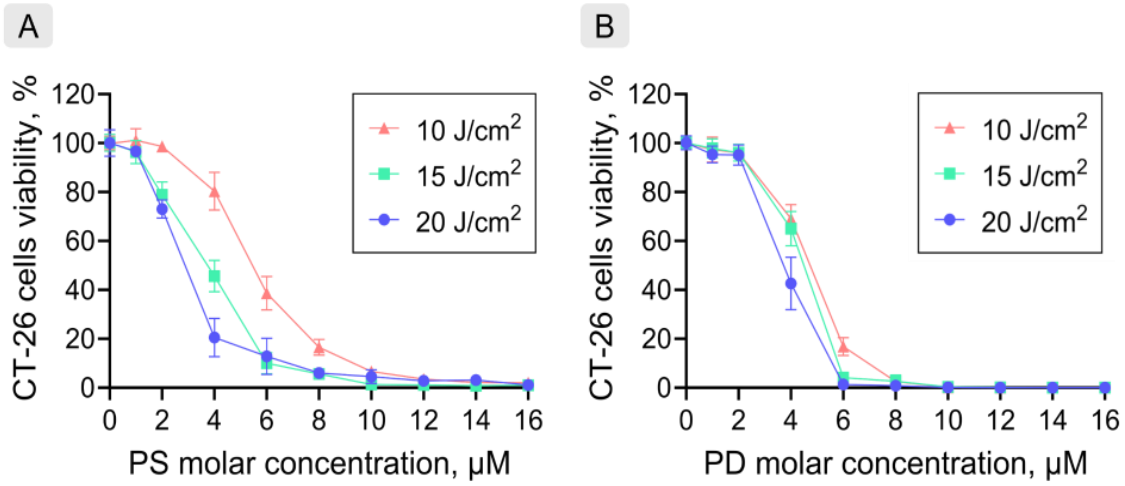

Fig. 3S. Assessment of light-induced toxicity of (A) PS and (B) PD at different energy densities (10, 15, and 20 J/cm²) on the CT-26 cell line. Results represent the mean ± standard deviation of samples measured in five repetitions.

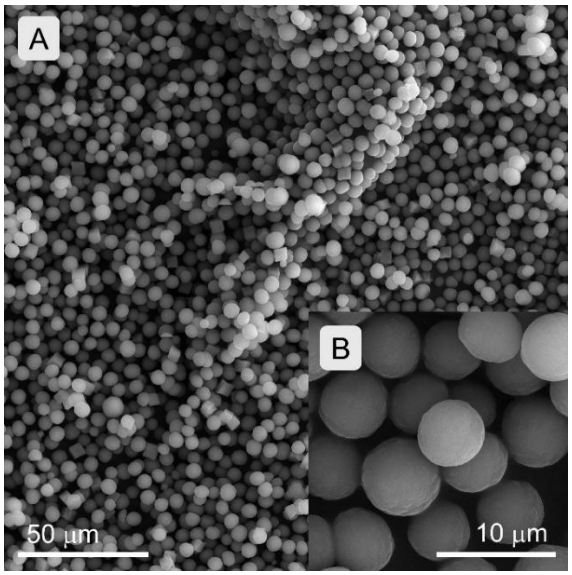

Fig. 4S. SEM images of vaterite cores at different magnifications: (A) 3.2 k×; (B) 10 k×.

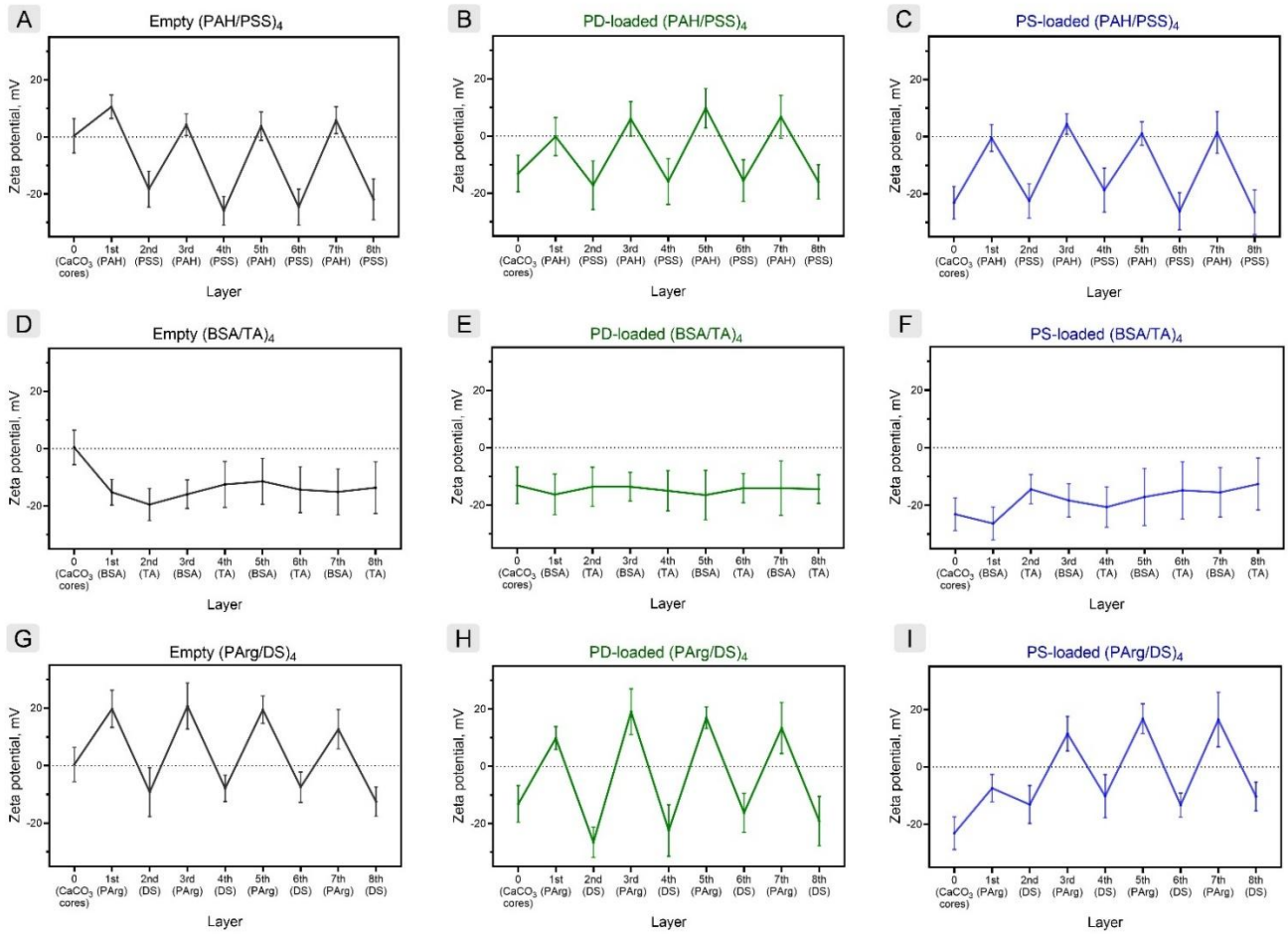

Fig. 5S. ζ-Potential profiles as a function of deposited layer number for different capsule formulations. Measurements were performed starting from either empty vaterite cores or dye-loaded cores, followed by sequential deposition up to the 8th polyelectrolyte layer (prior to core dissolution). (A) Empty $(PAH/PSS)_4$ system; (B) PD-loaded $(PAH/PSS)_4$; (C) PS-loaded $(PAH/PSS)_4$; (D) Empty $(BSA/TA)_4$; (E) PD-loaded $(BSA/TA)_4$; (F) PS-loaded $(BSA/TA)_4$; (G) Empty $(PArg/DS)_4$; (H) PD-loaded $(PArg/DS)_4$; (I) PS-loaded $(PArg/DS)_4$.

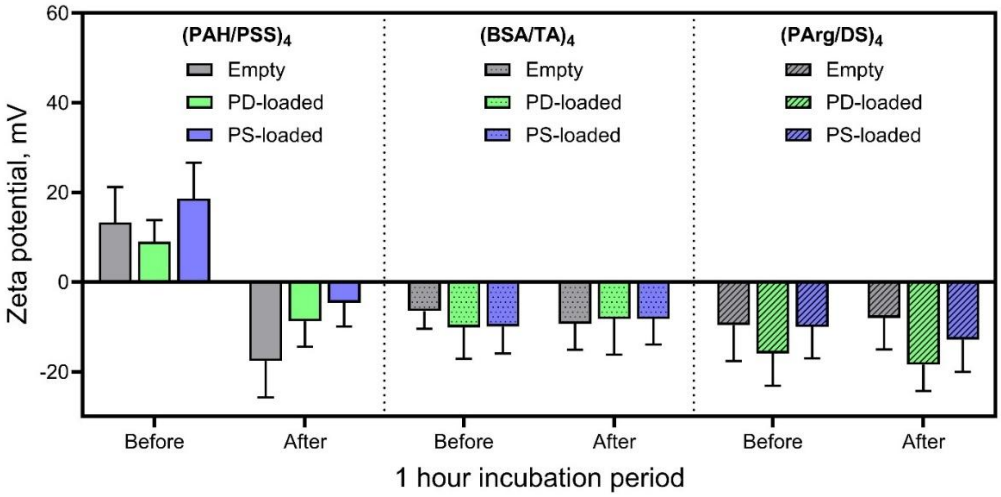

Fig. 6S. ζ-Potential values of microcapsules (after core dissolution) measured in deionized water before and after 1 h incubation in RPMI medium containing 10% FBS. Data are shown for $(PAH/PSS)_4$, $(PArg/DS)_4$, and $(BSA/TA)_4$ microcapsules, highlighting the effect of serum protein adsorption on surface charge.

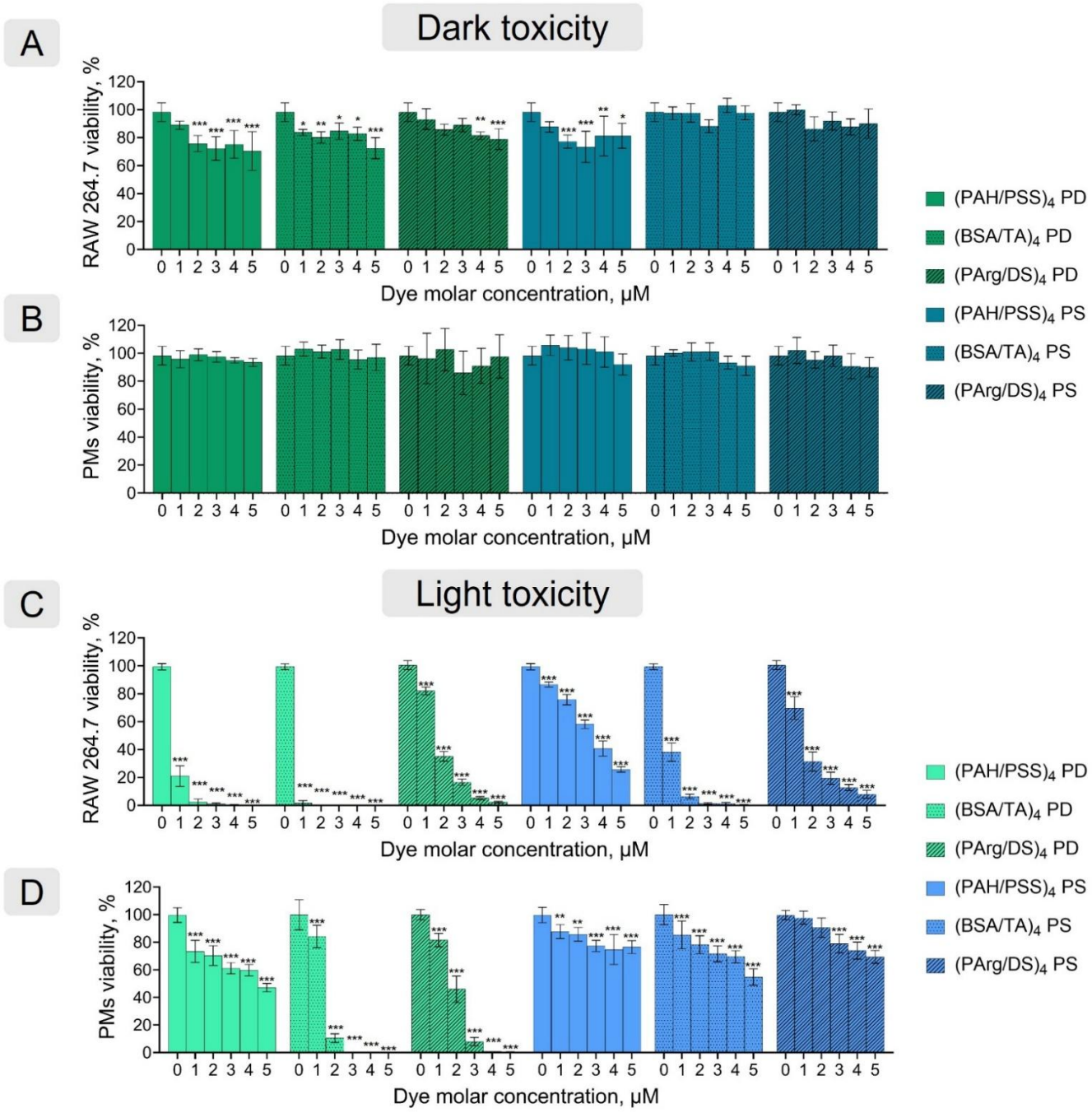

Fig. 7S. Evaluation of cytotoxicity for different microcapsule types loaded with photosensitizers (PS or PD) in macrophages. (A) Dark toxicity for RAW 264.7 cells. (B) Dark toxicity for PMs. (C) Light-induced toxicity for RAW 264.7 cells. (D) Light-induced toxicity for PMs. Data are presented as mean ± SD, n = 5, (*), (**), and (***) indicate groups that are significantly different from control (0 μM) with $p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively.

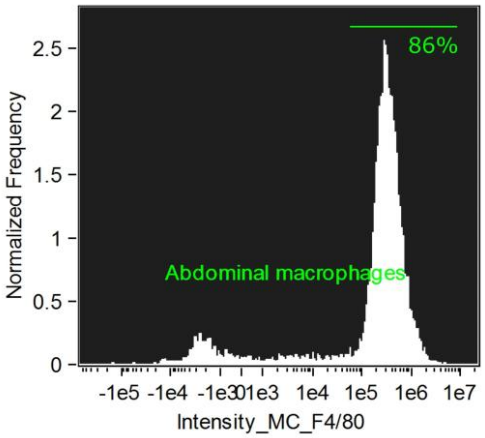

Fig. 8S. Intensity of F4/80 antibody staining in the primary culture of peritoneal macrophages obtained from the abdominal cavity of mice after cultivation and washing.

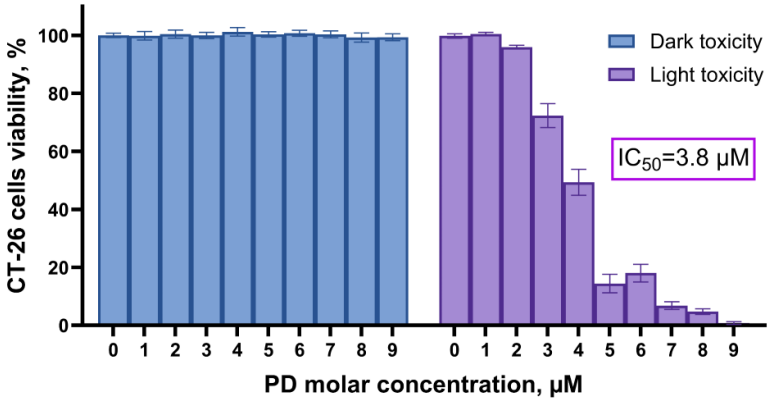

Fig. 9S. Dark and light cytotoxicity of $(PArg/DS)_4$ microcapsules loaded with PD against CT-26 cells. Results are presented as mean ± SD (n = 5).

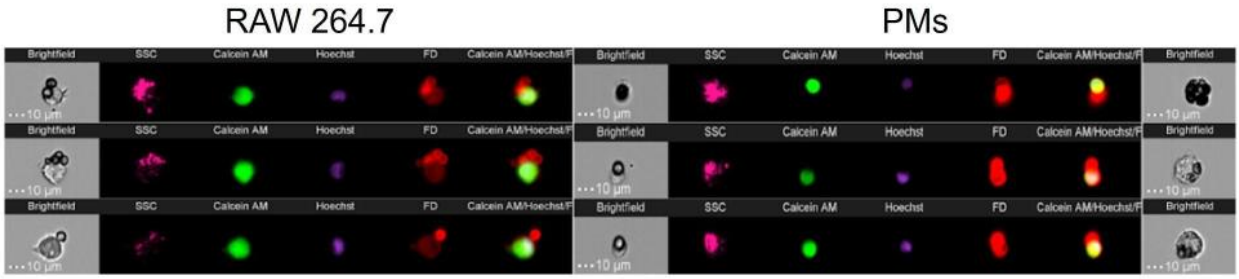

Fig. 10S. Visualization of RAW 264.7 cells and PMs with microcapsules using flow cytometry.

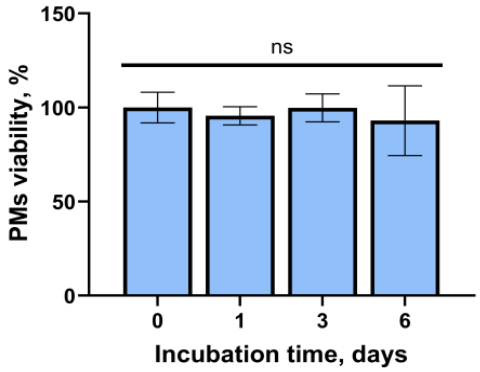

Fig. 11S. Long-term viability of peritoneal macrophages (PMs) exposed to $(PArg/DS)_4$ microcapsules loaded with Photoditazine (PD), assessed using the AlamarBlue assay on cultivation days 1, 3, and 6. Data are presented as mean ± SD (n = 5), one-way ANOVA followed by Tukey's post hoc test.

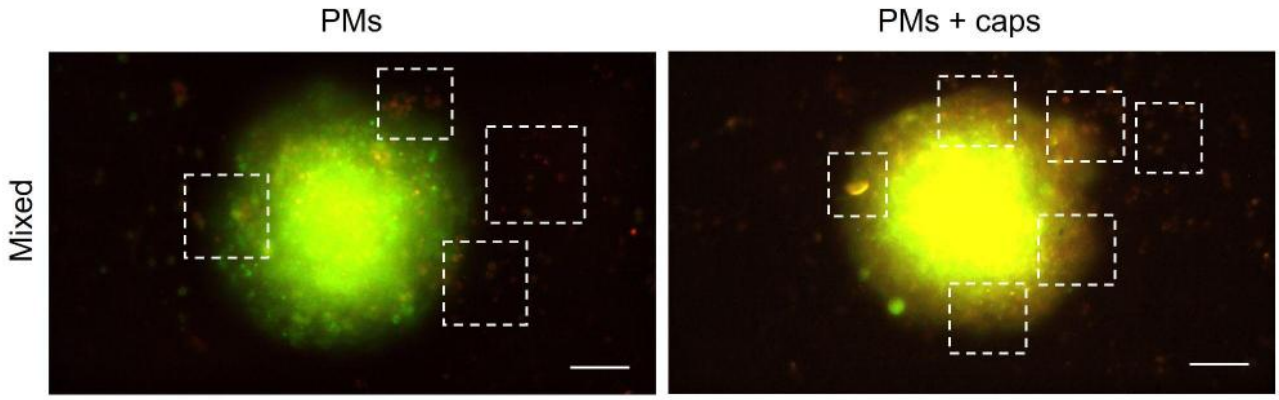

Fig. 12S. Detailed fluorescence images of PM migration to CT-26 spheroids. White dotted squares indicate visible clusters of macrophages. Scale bar: 100 μm.