Supplementary Figures

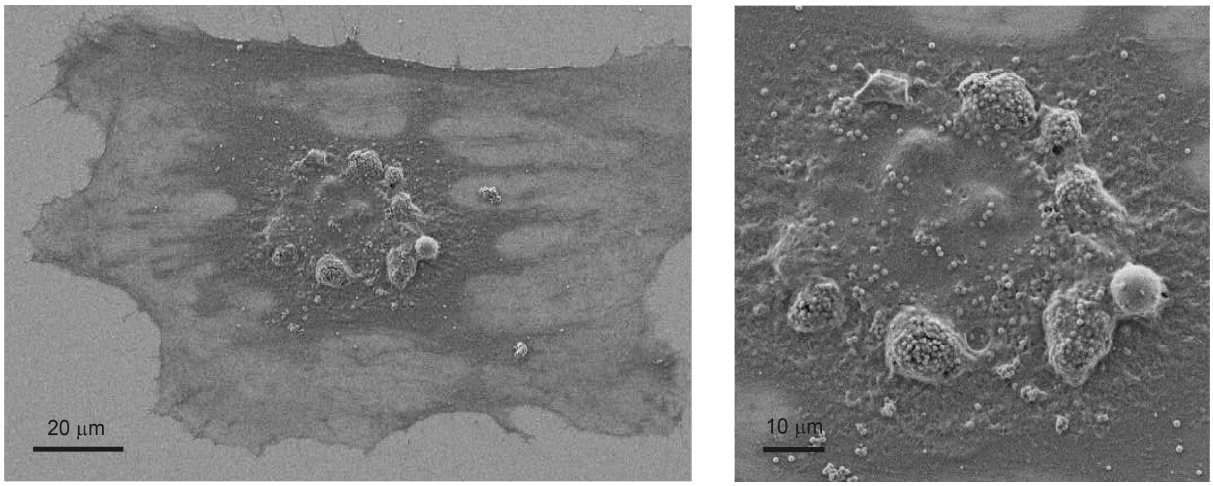

Fig. S1 SEM image of a large REF52 fibroblast filled with ingested 500 nm particles gathered around the nucleus (accelerating voltage 3kV). Most particles occupy large sacs where they are lumped together. It is unclear whether the sac creation occurs during ingestion or whether the particles fuse together within the cell at a later time. For the few cases where lumping was suppressed, colloidal crystallization did not occur.

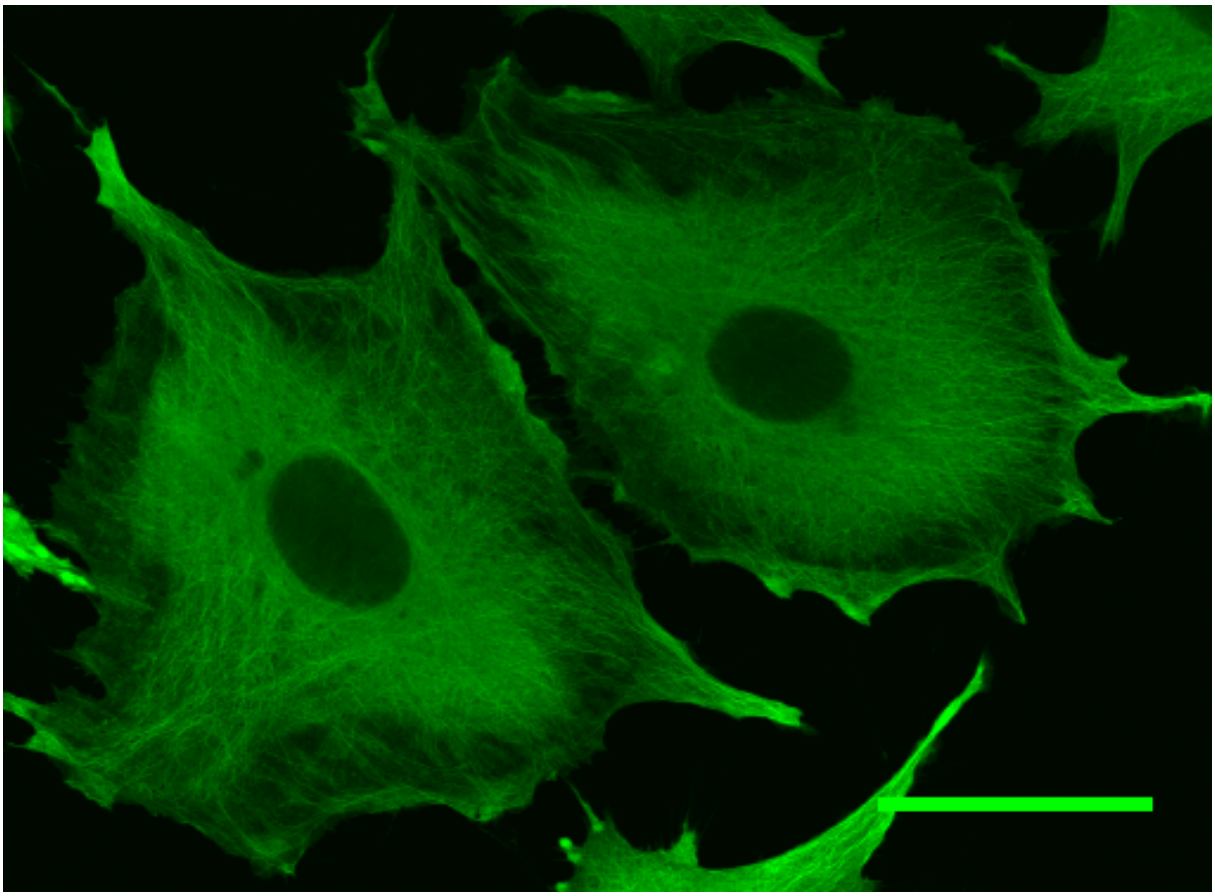

Fig. S2 Microtubule distribution in a REF52 fibroblast cells with no phagosomes. Scale bar is 40 μm.

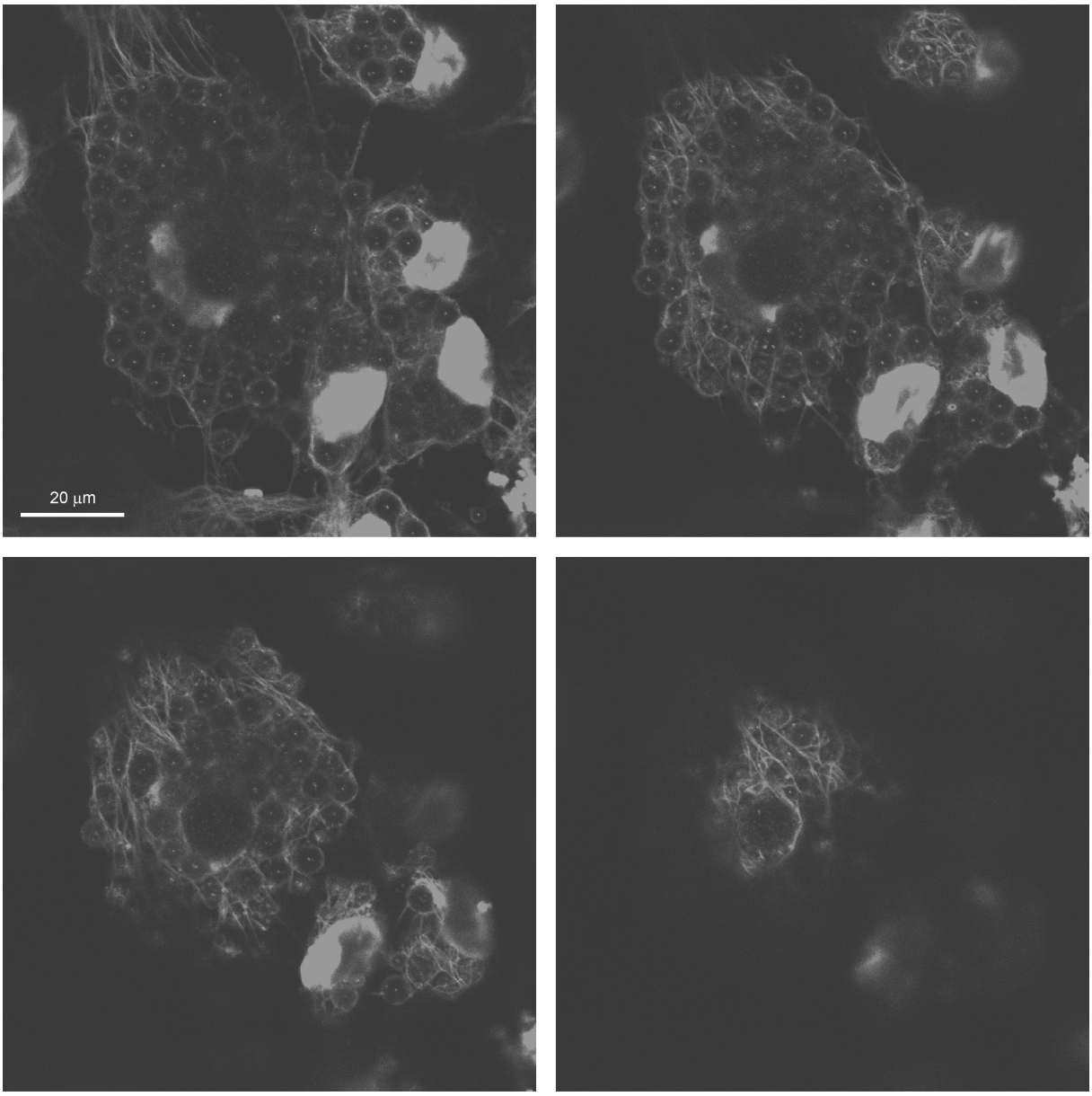

Fig. S3 Microtubule distribution imaged by 3D confocal microscopy. From left to right clockwise, the cell with a multi-layer crystallite is imaged in four slices. Unlike the actin microfilaments, microtubules weave throughout the crystallite structure. Since all microtubules stem from the centrosome located near the nucleus, if they didn't pass through the crystallite, there would be no microtubules in the outer regions of the cell.

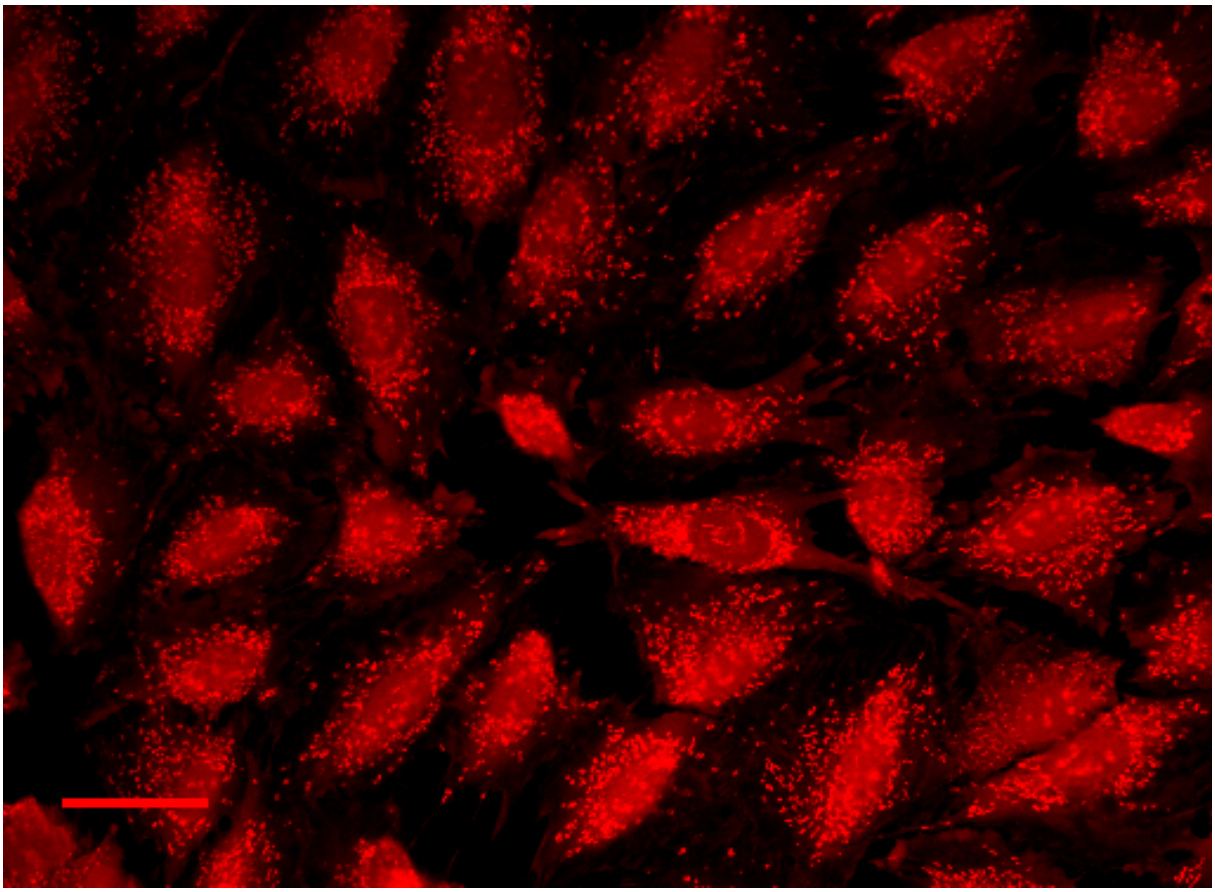

Fig. S4 Mitochondria distribution in cells with no phagosomes appears halo-like around the nucleus or evenly distributed throughout the cell. Scale bar is 40 μm.

Supplementary Movies

Movie 1 Phagocytosis and retrograde motion of particles in a fibroblast cell. Packing of the particles near the nucleus and confinement by the cell membrane drive colloidal crystallization.

Movie 2 Dynamics of crystallite formation in a large fibroblast cell.

Movie 3 Regrowth of actin cytoskeleton in fibroblast after a 60 minute exposure to 2 μM cytochalsin D. The growth of the actin demonstrably perturbs and rearranges the phagosomes, improving their order.

Movie 4 Regrowth of microtubules in fibroblast after 60 minute exposure to 2 μM nocadozole and their effect on the organization of phagosomes within the cell.