

Abstract

Single-Particle Tracking Porcine Epidemic Diarrhea Virus Moving along Microtubules in Living Cells [†]

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Abstract: Porcine epidemic diarrhea virus (PEDV), a member of the genus *Alphacoronavirus*, has caused severe damage to the swine industry. Although viruses are believed to hijack the microtubule-based transport system, the exact manner of PEDV moving along microtubules has not been fully characterized. In this study, PEDV was labeled with quantum dots which have great brightness and photostability. By using quantum dot-labeled PEDV and single-particle tracking, we were able to systematically dissect the dynamic behaviors of PEDV moving along the microtubules in living cells. We found that PEDVs maintained a restricted motion mode with a relatively stable speed in the cell membrane region while displaying a slow–fast–slow velocity pattern with different motion modes in the cell cytoplasm region and near the microtubule-organizing center. The return movements of small amounts of PEDVs were also observed in living cells. Collectively, our work is crucial for understanding the movement of PEDV in living cells; the proposed work also provides important references for further analysis and studies of the infection mechanism of PEDV.

Keywords: PEDV; single-particle tracking; microtubules



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