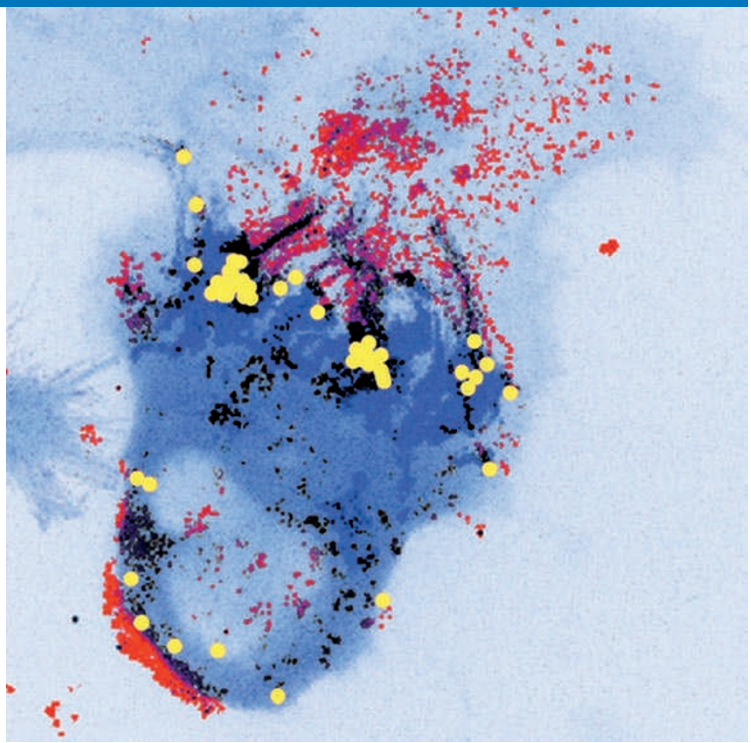
VIRAL INFECTION

Contact-polarized assembly

Sites of cell–cell contact are known to enhance the transmission of retroviruses from infected to uninfected cells. This increased transmission efficiency may be related to the fact that retroviral particles are known to accumulate at sites of contact; however, the mechanisms underlying this polarized localization are not well understood. Now, in an article published in *PLoS Biology*, Jin *et al*. show that most murine leukaemia virus (MLV) particle assembly occurs in the vicinity of cell–cell contact zones and in a manner that is dependent on the cytoplasmic tail of the MLV envelope (Env) glycoprotein.

The authors used spinning-disc confocal microscopy of cells transfected with MLV to track the *de novo* assembly, budding and release of individual MLV particles in three-dimensional space over time. They found a tenfold increase in the initiation of viral particle assembly at the sites of contact between infected and uninfected cells. The kinetics of particle assembly at these contact sites were similar to the kinetics of particle assembly elsewhere in the cell, indicating that the formation of individual MLV particles is not faster at the contact site. However, the authors did observe an increased local concentration of MLV Gag protein at the contact sites, suggesting that Gag-mediated nucleation of particle assembly may be enhanced in these regions. Previously, it had been shown that at the contact site there is a high-affinity interaction between the MLV receptor, mouse cationic amino acid transporter 1 (CAT1), on uninfected cells and the viral Env glycoprotein on infected cells. The authors postulated that this interaction might be involved in the polarized sorting of viral proteins such as Gag to cell–cell contact sites. Consistent with this idea, when they deleted the cytoplasmic tail of Env, they found that although cell–cell contacts were unaffected, polarized assembly of MLV particles was completely abolished.



De novo virus assembly in infected cells and subsequent spread to neighbouring cells. Red dots show murine leukaemia viruses and their tracks, black dots represent viruses moving together with the CAT1 receptor and yellow dots indicate *de novo* assembly sites. Image courtesy of J. Jin and W. Mothes, Yale University, USA.

> “…murine leukaemia virus (MLV) particle assembly occurs in the vicinity of cell–cell contact zones…”

It will be interesting to see whether such coupling of particle assembly to the site of contact between cells is a strategy adopted by other retroviruses, such as HIV.

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ORIGINAL RESEARCH PAPER Jin, J., Sherer, N. M., Heidecker, G., Derse, D. & Mothes, W. Assembly of the murine leukemia virus is directed towards sites of cell-cell contact. *PLoS Biol.* **7**, e1000163 (2009)

FURTHER READING Sattentau, Q. Avoiding the void: cell-to-cell spread of human viruses. *Nature Rev. Microbiol.* **6**, 815–826 (2008)