

MOVIE LEGENDS

Movie 1. CTL localization and dynamics in the meninges. Part 1: 3D reconstructions of two-photon z-stacks are shown for representative mice at day 5 and day 6 post-infection. Note at day 6 post-infection when mice were symptomatic, a substantial number of virus-specific CTL (white) localized to a narrow meningeal space (about 50 μm in height) between the bone (blue) and the pia. Very few CTL infiltrated the superficial parenchyma. At day 5 post-infection, almost no CTL were found in the same space. (Grid scale = 19.7 μm) **Part 2:** Virus-specific CTL (green) at day 6 post-infection tended to aggregate along the meningeal vessels walls (red), which are heavily infected by LCMV (see Figure 2) Blood vessels were visualized by injecting mice intravenously with quantum dots (red). (Grid scale = 119 μm) **Part 3:** Time lapse 3D reconstructions of CTL (white) in the meningeal space revealed highly dynamic tracks (multi-colored) of motion at baseline and following injection of control IgG or anti-MHC I antibody. (Grid scale = 29.6 μm)

Movie 2. LCMV infection of fibroblast-like cells around meningeal blood vessels. An animation of the LCMV-infected blood vessel from Figure 2i is shown so that the degree of vascular infection can be appreciated from all angles. Note that LCMV antigen (red) can be found around the entire blood vessel. ER-TR7⁺ fibroblast-like cells are shown in green and cell nuclei in blue.

Movie 3. Loss of vascular integrity during meningitis is not associated CTL activities.

Part 1: A representative 3D reconstruction of a two-photon z-stack is shown for a mouse at day 6 post-infection. Note the ragged vasculature (white) underneath the thinned skull bone (blue). Virus-specific CTL (green) were at times found in the regions of disrupted vasculature; however, the vascular damage appeared not be associated with CTL activity, but rather with unlabeled “ghost” outlines of larger cells that moved through the leaking quantum dots. **Part 2:** Two

representative time lapses at day 6 post-infection reveal ghost outlines of other cell types and CTL dynamics (green) which run independent of the vascular leakage (white). (Grid scale = 29.6 μm)

Movie 4. Myelomonocytic extravasation accompanies a sustained loss in vascular integrity. Part 1: A representative 60 min extended focus time lapse is shown for a mouse at day 6 post-infection. In the left time lapse LysM-GFP⁺ myelomonocytic cells (grayscale) can be seen extravasating non-directionally from a meningeal blood vessel. This is associated with severe, sustained leakage of quantum dots (red in left movie; grayscale in right movie) from the vessel. Focal accumulations of myelomonocytic cells were also observed (yellow circle). **Part 2:** Another representative example of myelomonocytic cell extravasation (green) and profound vascular leakage (grayscale) is shown as a time lapse 3D reconstruction. Images correspond to the scales in Figure 4.

Movie 5. Perivascular myelomonocytic cell aggregation accompanies transient vascular leakage. A representative 30 min extended focus time lapse (**Part 1**) and a 3D reconstruction of this time lapse (**Part 2**) is shown at day 6 post-infection for a LysM-GFP mouse depleted of neutrophils (PMN) with low dose anti-Gr-1 antibody. In the left time lapse LysM-GFP⁺ myelomonocytic cells (green) can be seen aggregating along meningeal blood vessels. This is associated with transient leakage of quantum dots (red in left movie; grayscale in right movie) from the vessel. Images correspond to the scales in Figure 4.