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Unravel the unknown bottlenecks in viral infections

Viral infections are restricted on several levels. This includes the susceptibility of the cells, intracellular transport of the viral genome to the site of replication, and the different immune responses. While cell entry pathways, and B- and T cell responses are under intensive investigation, intracellular trafficking and deamination, which bridges innate and adaptive immune response are less well understood. We are interested in human hepatitis B virus (HBV) and adeno-associated viruses (AAV) but also on SARS-CoV-2. While HBV and SARS-CoV-2 are important pathogens, AAVs do not cause any human disease but they are in turn a major platform for gene transfer as shown by emerging accredited drugs against genetic disorders. For HBV and AAVs, we follow the intracellular trafficking by high-end real-time microscopy, which gained enormous impact due to a recent technical approach allowing us to follow single, isolated genomes within living cells. While these initial transport steps are important for understanding the efficacy of initial infections, deamination targets changes of infectivity in ongoing infections and in virus spread.