Open postdoc position: Post-entry events in HIV-1 replication

May 7, 2026

The Department of Infectious Diseases, Virology at Heidelberg University offers a position for **postdocs at all career levels** to investigate **post-entry events in retrovirus replication.** Research will be conducted in the groups of **Hans-Georg Kräusslich** and **Barbara Müller**

Our groups study multiple aspects of HIV-1 assembly and maturation, as well as the fascinating events occurring after virus entry in the early phase of the retroviral replication cycle. After the mature viral capsid has entered the cytosol of a newly infected cell, retroviruses convert their RNA genome into dsDNA, transport it into the nucleus and integrate it into host chromatin after release from the viral capsid (uncoating). The role of the capsid in these steps recently underwent a major paradigm shift: capsid is no longer seen as a passive delivery container. Instead, it is now recognized as a key organizer of post-entry events instrumental for escape of HIV-1 from recognition by the innate immune system and serves as an attractive target for antiviral therapy. Recent data from us and others revealed that - contrary to text book knowledge - the cone-shaped capsid of HIV-1 can enter intact nuclei through nuclear pores, and indicate involvement of the capsid in nuclear events resulting in either productive or latent infection.

The complex post-entry events escape analysis by traditional bulk approaches. Therefore, we use advanced microscopy to visualize events at the single particle level with high temporal or spatial resolution. We will further develop our established systems to visualize HIV-1 DNA (Müller *et al.*, eLife 2021; Müller et al., EMBO J. 2025) and capsid (Schifferdecker *et al.,* MBio 2022) and apply them to investigate host interactions and structural changes using live imaging, super-resolution and MINFLUX nanoscopy as well as correlative light and electron microscopy and cryo-electron microscopy (Zila *et al.*, Cell 2021; Kreysing et al., 2025; Hacke et al., 2026; Petrich et al., 2024). These studies are complemented by cell biological approaches to discover and characterize relevant host dependency and restriction factors; they will involve application of chemical biology tools and capsid-targeted pharmacological interventions.

We offer an exciting and highly interdisciplinary research topics with biomedical relevance in an interactive and international scientific environment, including collaborations with national and international partners, at an internationally competitive level. The lab is located in the Center for Integrative Infectious Disease Research (www.ciid-heidelberg.de) which also houses the unique state-of-the-art IDIP imaging platform (www.idip-heidelberg.org). Postdocs are eligible for structured career support by the HeiTracks program of Heidelberg University (https://www.uni-heidelberg.de/en/research/support-for-early-career-researchers/career-support).

Applicants should have a doctoral degree in a relevant discipline (molecular and cell biology, biochemistry, biophysics or molecular medicine). They should be interested in addressing basic virological questions using a variety of methods, with a strong focus on imaging techniques and image analysis. A good background in standard molecular biological methods is expected. Ideally, candidates have already experience in fluorescence microscopy and image analysis, together with a background in cell biology, biochemistry or biophysics.

We are looking forward to meet curious and motivated applicants who are really excited about science. You should like to work independently, but also enjoy to interact, discuss and collaborate with researchers from different disciplines and nations.

The position is open immediately. Please send your application (CV, academic transcript, motivation letter and reference letters or contact details of two referees) until **June 15, 2026** as a **single pdf file** to
Propaedeutik.Lehre@med.uni-heidelberg.de

Relevant publications:

Hacke et al. (2026). Multiplex 3D Nanoscopy Resolves Nanoarchitecture of Human Immunodeficiency Virus. DOI: 10.1021/acsnano.5c12222

Müller et al. (2025) Lenacapavir-induced capsid damage uncovers HIV-1 genomes emanating from nuclear speckles. EMBO J. doi: 10.1038/s44318-025-00652-5.

Kreysing et al. (2024) Passage of the HIV-1 capsid cracks the nuclear pore. Cell. doi: 10.1016/j.cell.2024.12.008

Petrich et al. (2024) Expanding Insights: Harnessing Expansion Microscopy for Super-Resolution Analysis of HIV-1-Cell Interactions.Viruses. 2024 Oct 15;16(10):1610. doi: 10.3390/v16101610

Schifferdecker *et al.* (2022) Direct capsid labeling of infectious HIV-1 by genetic code expansion allows detection of largely complete nuclear capsids and suggests nuclear entry of HIV-1 complexes via common routes. mBio. 2022 Oct 26;13(5):e0195922. doi: 10.1128/mbio.01959-22

Müller *et al.* (2021) HIV-1 uncoating by release of viral cDNA from capsid-like structures in the nucleus of infected cells. *eLife* 10, e64776 doi: 10.7554/eLife.64776

Zila *et al.* (2021) Cone-shaped HIV-1 capsids are transported through intact nuclear pores. *Cell* 184, 1032-1046.e18 doi: 10.1016/j.cell.2021.01.025

Reviews:

Müller TG, Zila V, Müller B, Kräusslich HG (2022) Nuclear Capsid Uncoating and Reverse Transcription of HIV-1. Annu Rev Virol. 2022 Sep 29;9(1):261-284. doi: 10.1146/annurev-virology-020922-110929.

Müller *et al.* (2019) A Spotlight on Viruses - Application of Click Chemistry to Visualize Virus-Cell Interactions. *Molecules*; 24(3), E481. doi: 10.3390/molecules24030481