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Recombinant pseudorabies virus strains as intracranially injected retrograde tracers

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Recently developed recombinant neurotropic pseudorabies (PRV) viruses were pressure injected into the auditory cortex in rats. The medial geniculate body (MGB) and the inferior colliculus (IC) were examined for the presence of mono- and transsynaptically labeled neurons, respectively. The infected neurons were visualized using the specific marker they expressed and by PRV immunolabeling. We confirmed our previous findings namely, that the site of virus injection in the brain cannot be determined based only on labeling of viral proteins. To circumvent this problem and also to identify direct as opposed to transsynaptic connections, the virus was co-injected with monosynaptic retrograde tracers cholera toxin B subunit (CTb) or Fluorogold (FG). Surprisingly, these tracers inhibited viral infection to a degree that it was not observed when the virus was co-injected with a high concentration of monosynaptic tracers. Lowering tracer concentration resulted in an appearance of virus-labeled neurons around CTb- or FG-labeled neurons in the MGB. Very low concentrations of monosynaptic retrograde tracers, that already did not label neurons in the MGB, allowed viral infections throughout the MGB and IC. Since these very low concentrations of tracers were still visible at the injection site, their co-injection is useful in the identification and topographical localization of the injection site following intracranial viral injections.

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