Human Immunodeficiency Virus Type 1 (HIV-1) Molecular Clone NL4-BAL-CO-nLuc

Catalog No. HRP-20083

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For research use only. Not for use in humans.

Contributor:

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Manufacturer:

NIH HIV Reagent Program

Product Description:

HRP-20083 is a replication-competent, CCR5-tropic human immunodeficiency virus type 1 (HIV-1) reporter construct designed to encode a bioluminescent nanoluciferase (nLuc) protein upstream of the encephalomyocarditis virus internal ribosome entry site (IRES), 6ATRi, to allow expression of Nef.[1,2] The plasmid encodes full-length, replication-competent HIV-1 in a pUC18 backbone. The reporter gene was codon optimized to remove cytosine/guanine (CG) dinucleotides, giving improved replication *in vitro* and reporter expression *in vivo* and *ex vivo*.[1,2] The beta-lactamase gene, *bla*, provides transformant selection through ampicillin resistance in *Escherichia coli (E. coli)*. The resulting size of the plasmid is reported to be approximately 15000 base pairs. The complete plasmid sequence is provided on the HIV Reagent Program webpage.

HRP-20083 and its near-infrared fluorescent protein counterpart (HIV-1NL4-BAL-CO-iRFP; available as HRP-20084) are the first replication-competent reporter HIV-1 viruses that can express all viral proteins (including Nef) and allow stable expression of the reporter over time due to replacement of CG dinucleotides that are targeted by the innate immune factor ZAP (zinc finger antiviral protein). HIV-1 reporter virus replication and reporter gene expression were measured in cell culture and in humanized mice. These viruses can be used to infect humanized mice and can be visualized via whole body imaging for months, with the intensity of the reporter signal correlating with plasma viremia in humanized mice.[1,2]

Material Provided:

Each vial contains plasmid DNA in TE buffer (10 mM Tris-HCl, 1 mM EDTA, pH 8.0). The DNA concentration and volume provided are shown on the Certificate of Analysis. The vial should be centrifuged prior to opening. Note: The contents of the vial should be used to replicate the plasmid in *E. coli* prior to mammalian expression.

Packaging/Storage:

HRP-20083 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen and should be stored at -20°C or colder immediately upon arrival. Freeze-thaw cycles should be avoided.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through the NIH HIV Reagent Program, NIAID, NIH: Human Immunodeficiency Virus Type 1 (HIV-1) Molecular Clone NL4-BAL-CO-nLuc, HRP-20083, contributed by Dr. Zandrea Ambrose."

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 6th ed. Washington, DC: U.S. Government Printing Office, 2020; see www.cdc.gov/biosafety/publications/bmbl5/index.htm.

Disclaimers:

You are authorized to use this product for research use only. It is not intended for human use.

Use of this product is subject to the terms and conditions of the NIH HIV Reagent Program Material Transfer Agreement (MTA). The MTA is available on our Web site at www.hivreagentprogram.org.

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NIH HIV Reagent Program
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References:

1. Ambrose, Z., Personal Communication.
2. Roy, C. N., et al. "CG Dinucleotide Removal in Bioluminescent and Fluorescent Reporters Improves HIV-1 Replication and Reporter Gene Expression for Dual Imaging in Humanized Mice." J. Virol. 95 (2021): e0044921. PubMed: 34232063.

Support Provided by NIAID