



HyperMu™ MuA Transposase

Cat. No. **THM03210**

HyperMu™ MuA Transposase is a hyperactive enzyme that is at least 50 times more active than the MuA transposase available from other suppliers of Mu-based systems. The highly purified, single-subunit HyperMu MuA Transposase can be used to randomly insert (transpose or “hop”) any HyperMu Transposon into any target DNA *in vitro* with an efficiency up to $>10^6$ insertion clones per standard reaction. HyperMu MuA Transposase can also catalyze transposition of other artificial Mu transposons that have the R1 and R2 recognition sequences in the proper orientation at each end. The DNA between the R1 and R2 recognition sequences can be *any* DNA, including DNA encoding selectable markers, origins of replication or other genetic elements.

Further, when HyperMu MuA Transposase is incubated with an artificial Mu transposon in the absence of Mg^{2+} , a stable HyperMu Transposome™* complex is formed. A HyperMu Transposome can be electroporated into living cells, where it is activated by intracellular Mg^{2+} and the Mu transposon component is randomly inserted into the host's DNA *in vivo*.

A typical HyperMu transposition reaction requires four components: 1) the HyperMu MuA Transposase; 2) an artificial Mu transposon; 3) a target DNA; and 4) the presence of Mg^{2+} . Insertion of an artificial Mu transposon into the target DNA results in a 5-bp duplication of target DNA sequence immediately adjacent to both ends of the transposon.

Product Specifications

Storage: Store only at $-20^{\circ}C$ in a freezer without a defrost cycle.

Storage Buffer: HyperMu MuA Transposase is supplied in a 50% glycerol solution containing 50 mM Tris-HCl (pH 7.5), 100 mM NaCl, 0.1 mM EDTA, 0.1% Triton® X-100 and 1 mM dithiothreitol.

HyperMu™ MuA Transposase Components

HyperMu™ MuA Transposase.....	10 U (1 U/ μ l; 250 ng/ μ l)
HyperMu™ 10X Reaction Buffer.....	100 μ l
HyperMu™ 10X Stop Solution.....	100 μ l
Sterile Water	1 ml

HyperMu 10X Stop Solution: is 1% SDS.

Contaminating Activity Assays: All components of the HyperMu MuA Transposase are free of detectable DNase and RNase activities as judged by agarose gel electrophoresis following over-digestion assays, with the exception of the inherent endonucleolytic function of the HyperMu MuA Transposase.

HyperMu 10X Reaction Buffer: is 1.5 M potassium acetate, 0.5 M Tris-acetate (pH 7.5), 0.1 M magnesium acetate and 40 mM spermidine. **Note: This buffer contains Mg^{2+} . Do not use for the production of Transposomes.**

Related Products: The following products are also available:

- HyperMu™ Transposons
- HyperMu™ Insertion Kits
- HyperMu™ <R6K γ ori/KAN-1>Tnp Transposome™ Kit
- TransforMax™ EC100™ Electrocompetent *E. coli*
- Phage T1-Resistant TransforMax™ EC100™-T1^R Electrocompetent *E. coli*

Visit our website at <http://www.epicentre.com> for more information on our wide variety of Tn5-based EZ-Tn5™ Transposon Tools for genetic analysis and sequencing.

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Applications

I. *In Vitro* Transposon Insertion Reaction

This reaction inserts an artificial Mu transposon into target DNA, *in vitro*. The target DNA should be free of contaminating chromosomal DNA which is a direct competitor of the target DNA for insertion. Reaction conditions given have been optimized to maximize transposition frequency while minimizing multiple insertion events.

Amount of Target DNA: Use 300 ng of DNA if the size of the target is 10 kb or less. If the target DNA is larger, increase the amount present in the reaction in proportion to the size. For example, if the target DNA is 20 kb, use up to 600 ng per reaction; if the target DNA is 40 kb, use up to 1,200 ng per reaction. For targets larger than 40 kb, use up to 1,200 ng per reaction.

1. Prepare the transposon insertion reaction mixture by adding in the following order:
 - 2 μ l HyperMu 10X Reaction Buffer
 - x ng target DNA (see above)
 - 25 ng artificial Mu transposon
 - x μ l Sterile Water to a reaction volume of 19 μ l
 - 1 μ l HyperMu MuA Transposase (1 U/ μ l)
 - 20 μ l Total reaction volume
2. Incubate the reaction mixture for 2 hours at 37°C.
3. Stop the reaction by adding 1 μ l HyperMu 10X Stop Solution. Mix and heat for 10 minutes at 70°C.
4. Use 1 μ l for electroporation into a competent bacterial strain and plate on selective media as dictated by the transposon insert. Use of a *recA*⁻, *endA*⁻ strain is preferable, for target stability and subsequent purification steps (e.g. EPICENTRE's TransforMax™ EC100™ Electrocompetent *E. coli* or Phage T1-Resistant TransforMax EC100-T1^R Electrocompetent *E. coli*), but not absolutely necessary. Store unused reaction mixture at -20°C.

II. Production of HyperMu Transposomes

Production of stable HyperMu Transposomes can only be accomplished in the absence of Mg²⁺.

Do not use the HyperMu 10X Reaction Buffer provided with the HyperMu MuA Transposase to prepare HyperMu Transposomes.

1. Prepare the transposome reaction mixture by adding in the following order:**
 - 1 μ l artificial Mu transposon (500 ng/ μ l in TE Buffer [10 mM Tris-HCl (pH 7.5), 1 mM EDTA])
 - 17 μ l Storage Buffer [50% glycerol solution containing 50 mM Tris-HCl (pH 7.5), 100 mM NaCl, 0.1 mM EDTA, 0.1% Triton® X-100 and 1 mM dithiothreitol]
 - 2 μ l HyperMu MuA Transposase
 - 20 μ l Total reaction volume
2. Mix by vortexing. Incubate for 30 minutes at room temperature.
3. Store the solution at -20°C.
The solution will not freeze stored at -20°C and is stable for at least one year.
4. Use 1 μ l of the HyperMu Transposome for electroporation into a competent bacterial strain and plate on selective media as dictated by the transposon insert.

** The HyperMu Transposome production protocol can be scaled up or scaled down as needed.

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* **Use of Transposome™ Complexes for *In Vivo* Transposon Insertion**, including, but not limited to EZ-Tn5™ and HyperMu™ Transposome complexes, is covered by U.S. Patent Nos. 6,159,736 and 6,294,385; European Patent No. 1115856 and other patents issued or pending, exclusively licensed to EPICENTRE. These products are accompanied by a limited non-exclusive license for nonprofit organizations to use the purchased products solely for life science research. Specifically, researchers at nonprofit organizations may use these products in their research and they may transfer derivatives of the products to colleagues at other nonprofit organizations provided that such colleagues agree in writing to be bound by the terms and conditions of this label license. Researchers may not transfer these products or its derivatives to researchers at other organizations that are not nonprofit organizations without the express written consent of EPICENTRE and without those entities having an express license from EPICENTRE for the use of the products. Other than as specifically provided here, an authorized transferee of these products shall have no right to transfer these products or its derivatives to any other person or entity. A nonprofit organization performing research using this product for a for-profit organization shall also be considered for-profit. For-profit entities purchasing these products shall have six (6) months to evaluate the products in their research. Thereafter, such for-profit entities shall either contact EPICENTRE and take a license for their continued use of the products or destroy the products and all derivatives thereof. Please contact EPICENTRE with respect to licenses for commercial use, including manufacturing, therapeutic or diagnostic use.