This is a set of 15 marker swap vectors, each containing a gene disruption conversion cassette for conversion between standard markers used for transformation selection in Saccharomyces cerevisiae. The vectors are useful in changing markers for gene disruptions or for changing markers on plasmids.

Maps for some of the vectors can be found on the ATCC web page or in the reference. Vectors are all in E. coli and arrayed on a microtiter plate. A key to the plate is provided below.

### Description

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### Vector Information

**ATCC® Catalog No. 87542**  
**Designation:** pHL3, Other name(s): HIS3 → LEU2 converter  
**Excise Insert:** ApaI+PstI  
**Size of construct (kb):** 7.7  
**Markers:** cmR, LEU2  
**Growth temperature:** 37°C  
**Growth medium:** LB medium + 25 µg/mL chloramphenicol

**NOTES:**  
Restriction digests of the clone give the following sizes (kb): BglII−4.4, 3.1; EcoRI−7.6; HindIII−4.1, 3.5.  
– ATCC staff  
To convert the host phenotype from the existing yeast auxotrophic marker to a new marker (e.g., HIS3 → LEU2), transform with the restriction enzyme digested vector (e.g., ApaI+PstI digested pHL3) and select for the appropriate phenotype (for pHL3, Leu+).

Some combinations of marker swap plasmids and target locus may result in relatively high reversion rates. In most, but not all cases, the frequencies of successful convertants are greater than 30%. When swapping markers on an episomal plasmid, appropriate phenotype may result from loss of the plasmid unless a second selectable or scorable marker is used to ensure plasmid maintenance.  
Refer to reference for more information.  

**ATCC® Catalog No. 87543**  
**Designation:** pHT6, Other name(s): HIS3 → TRP1 converter  
**Excise Insert:** Smal+Xhol  
**Size of construct (kb):** 7.0  
**Markers:** cmR, kanR, TRP1  
**Growth temperature:** 37°C
S. cerevisiae/E. coli marker swap vectors (ATCC® 87561™)

**Product Sheet**

**Growth medium:** LB + kanamycin (50 µg/mL) + chloramphenicol (25 µg/mL)

**NOTES:**

Restriction digests of the clone give the following sizes (kb): HindIII/PstI—5.5, 1.0, 0.6; HindIII/SalI—5.1, 2.2.

- ATCC staff

To convert the host phenotype from HIS3 to TRP1, transform with the SmaI+XhoI digested vector and select for Trp+ transformants. Vector was constructed by replacing an internal HindIII fragment of HIS3 with a SmaI fragment containing the TRP1 and kanR coding sequences. TRP1 and HIS3 are in the same orientation.


**ATCC® Catalog No. 87544**

**Designation:** pHU10

**Other name(s):** HIS3 → URA3 converter

**Excise insert:** SmaI+XhoI

**Size of construct (kb):** 6.6

**Markers:** cmlR, kanR, URA3

**Growth temperature:** 37°C

**Growth medium:** LB + kanamycin (50 µg/mL) + chloramphenicol (25 µg/mL)

**NOTES:**

Restriction digests of the clone give the following sizes (kb): HindIII—6.5; HindIII/PstI—5.0, 1.1, 0.5.

- ATCC staff

To convert the host phenotype from HIS3 to URA3, transform with the SmaI+XhoI digested vector and select for Ura+ transformants. Vector was constructed by replacing an internal HindIII fragment of HIS3 with a SmaI fragment containing the URA3 and kanR coding sequences. URA3 and HIS3 are in the opposite orientation.


**ATCC® Catalog No. 87545**

**Designation:** pLH7

**Other name(s):** LEU2 → HIS3 converter

**Excise insert:** XhoI+HpaI

**Size of construct (kb):** 8.7

**Markers:** cmlR, kanR, HIS3

**Growth temperature:** 37°C

**Growth medium:** LB + kanamycin (50 µg/mL) + chloramphenicol (25 µg/mL)

**NOTES:**

Restriction digests of the clone give the following sizes (kb): BamHI/EcoRI—6.6, 2.0; XhoI—8.7.

- ATCC staff

To convert the host phenotype from LEU2 to HIS3, transform with the XhoI+HpaI digested vector and select for His+ transformants. Vector was constructed by replacing an internal EcoRV fragment of LEU2 with a SmaI fragment containing the HIS3 and kanR coding sequences. HIS3 and LEU2 are in the same orientation.


**ATCC® Catalog No. 87546**

**Designation:** pLT11

**Other name(s):** LEU2 → TRP1 converter

**Excise insert:** XhoI+HpaI

**Size of construct (kb):** 10.5

**Markers:** cmlR, ampR, TRP1

**Growth temperature:** 37°C

**Growth medium:** LB + ampicillin (50 µg/mL) + chloramphenicol (20 µg/mL)

**NOTES:**

Restriction digests of the clone give the following sizes (kb): BamHI—8.4, 2.1; BamHI/XhoI—4.9, 3.3, 2.2.

- ATCC staff

To convert the host phenotype from LEU2 to TRP1, transform with the XhoI+HpaI digested vector and select for Trp+ transformants. Vector was constructed by replacing an internal EcoRI/EcoRV fragment of LEU2 with an XhoI-EcoRI fragment containing the TRP1 and ampR coding sequences.


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**Intended Use**

This product is intended for research use only. It is not intended for any animal or human therapeutic or diagnostic use.

**Citation of Strain**

If use of this culture results in a scientific publication, it should be cited in that manuscript in the following manner: (ATCC® 87561™)

**Shipping Information**

Frozen glycerol of Escherichia coli HB101 stocks containing the plasmids arrayed on a microtiter plate

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American Type Culture Collection
PO Box 1549
Manassas, VA 20108 USA
www.atcc.org
800.638.6597 or 703.365.2700
Fax: 703.365.2750
Email: Tech@atcc.org

Or contact your local distributor
### S. cerevisiae/E. coli marker swap vectors (ATCC® 87561™)

#### ATCC® Catalog No. 87547
**Designation:** pLU12  
**Other name(s):** LEU2 → URA3 converter  
**Excise insert:** XhoI+HpaI  
**Size of construct (kb):** 8.5  
**Markers:** cmlR, kanR, URA3  
**Growth temperature:** 37°C  
**Growth medium:** LB + kanamycin (50 µg/mL) + chloramphenicol (25 µg/mL)

**NOTES:**
Restriction digests of the clone give the following sizes (kb): BamHI→8.8; BamHI/XhoI→5.5, 3.2; EcoRI/HindIII→7.5, 1.2; HpaI/XhoI→4.6, 4.2.  
- ATCC staff  
To convert the host phenotype from LEU2 to URA3, transform with the XhoI+HpaI digested vector and select for Ura+ transformants. Vector was constructed by replacing an internal EcoRV fragment of LEU2 with a SmaI fragment containing the URA3 and kanR coding sequences. URA3 and LEU2 are in the opposite orientation.  

#### ATCC® Catalog No. 87548
**Designation:** pTH4  
**Other name(s):** TRP1 → HIS3  
**Excise insert:** XhoI+EcoRI  
**Size of construct (kb):** 6.7  
**Markers:** cmlR, kanR, HIS3  
**Growth temperature:** 37°C  
**Growth medium:** LB + kanamycin (50 µg/mL) plus chloramphenicol (25 µg/mL)

**NOTES:**
Restriction digests of the clone give the following sizes (kb): EcoRI→6.7; HindIII→4.8, 1.9; EcoRI/XhoI→3.5, 3.3.  
- ATCC staff  
To convert the host phenotype from TRP1 to HIS3, transform with the XhoI+EcoRI digested vector and select for His+ transformants. Vector was constructed by replacing an internal EcoRV fragment of TRP1 with a SmaI fragment containing the HIS3 and kanR coding sequences. HIS3 and TRP1 are in the same orientation.  

#### ATCC® Catalog No. 87549
**Designation:** pTL7  
**Other name(s):** TRP→ LEU2 converter  
**Excise insert:** XhoI+SmaI  
**Size of construct (kb):** 7.8  
**Markers:** cmlR, kanR, LEU2  
**Growth temperature:** 37°C  
**Medium composition:** LB + kanamycin (50 µg/mL) + chloramphenicol (25 µg/mL)

**NOTES:**
Restriction digests of the clone give the following sizes (kb): EcoRI→6.2, 1.7; HindIII→7.8; SmaI/XhoI→4.4, 3.3.  
- ATCC staff  
To convert the host phenotype from TRP1 to LEU2, transform with the XhoI+SmaI digested vector and select for Leu+ transformants. Vector was constructed by replacing an internal EcoRV fragment of TRP1 with a SmaI fragment containing the LEU2 and kanR coding sequences. LEU2 and TRP1 are in the same orientation.  

#### ATCC® Catalog No. 87550
**Designation:** pTU10

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*S. cerevisiae/E. coli marker swap vectors (ATCC® 87561™)

**Product Sheet**

**Storage Temp.** Store frozen plate at -80°C

**Biosafety Level** 1

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**Intended Use**

This product is intended for research use only. It is not intended for any animal or human therapeutic or diagnostic use.

**Citation of Strain**

If use of this culture results in a scientific publication, it should be cited in that manuscript in the following manner: (ATCC® 87561™)

**Shipping Information**

Frozen glycerol of *Escherichia coli* HB101 stocks containing the plasmids arrayed on a microtiter plate

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American Type Culture Collection  
PO Box 1549  
Manassas, VA 20108 USA  
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Fax: 703.365.2750  
Email: Tech@atcc.org  
Or contact your local distributor

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Page 3 of 6
Other name(s): TRP1→ URA3 converter
Excise insert: XhoI+EcoRI
Size of construct (kb): 6.6
Markers: cmIR, kanR, URA3
Growth temperature: 37°C
Medium composition: LB + kanamycin (50 µg/mL) plus chloramphenicol (25 µg/mL)

NOTES:
Restriction digests of the clone give the following sizes (kb): EcoRI−6.6; HindIII−5.0, 1.6; EcoRI/XhoI−3.4, 3.2.
- ATCC staff
To convert the host phenotype from TRP1 to URA3, transform with the XhoI+EcoRI digested vector and select for Ura+ transformants. Vector was constructed by replacing an internal EcoRV fragment of TRP1 with a SmaI fragment containing the URA3 and kanR coding sequences. URA3 and TRP1 are in the opposite orientation.

ATCC® Catalog No. 87551
Designation: pUH7
Other name(s): URA3 → HIS3 converter
Excise insert: SmaI
Size of construct (kb): 6.5
Markers: ampR, kanR, HIS3
Growth temperature: 37°C
Medium composition: LB medium + 50 µg/mL ampicillin and 20 µg/mL kanamycin

NOTES:
Restriction digests of the clone give the following sizes (kb): EcoRI−6.4; SmaI−3.5, 2.8; XbaI−3.6, 2.7.
- ATCC staff
To convert the host phenotype from URA3 to HIS3, transform with the SmaI digested vector and select for His+ transformants. Vector was constructed by replacing an internal StuI fragment of URA3 with a SmaI fragment containing the HIS3 and kanR coding sequences. HIS3 and URA3 are probably in the opposite orientation.

ATCC® Catalog No. 87552
Designation: pUL9
Other name(s): URA3 → LEU2 converter
Excise insert: SmaI
Size of construct (kb): 7.45
Markers: ampR, kanR, LEU2
Growth temperature: 37°C
Growth medium:

Frozen glycerol of Escherichia coli HB101 stocks containing the plasmids arrayed on a microtiter plate

NOTES:
Restriction digests of the clone give the following sizes (kb): Expected SmaI digest fragments of 2.74 kb and 4.71 kb
Expected EcoRI digest fragments of 2.95 kb and 4.5 kb
- ATCC staff
To convert the host phenotype from URA3 to LEU2, transform with the SmaI digested vector and select for Leu+ transformants. Vector was constructed by replacing an internal StuI fragment of URA3 with a SmaI fragment containing the LEU2 and kanR coding sequences. LEU2 and URA3 are in the same orientation.

ATCC® Catalog No. 87553
Designation: pUT11
Other name(s): URA3 → TRP1 converter
Excise insert: SmaI
Size of construct (kb): 6.7
Markers: ampR, kanR, TRP1
Growth temperature: 37°C
Growth medium:

Frozen glycerol of Escherichia coli HB101 stocks containing the plasmids arrayed on a microtiter plate

NOTES:
Restriction digests of the clone give the following sizes (kb): Expected SmaI digest fragments of 2.74 kb and 4.71 kb
Expected EcoRI digest fragments of 2.95 kb and 4.5 kb
- ATCC staff
To convert the host phenotype from URA3 to TRP1, transform with the SmaI digested vector and select for Trp+ transformants. Vector was constructed by replacing an internal StuI fragment of URA3 with a SmaI fragment containing the TRP1 and kanR coding sequences. TRP1 and URA3 are in the opposite orientation.
NOTES:
Restriction digests of the clone give the following sizes (kb): HindIII–4.6, 2.0; Smal–3.8, 2.7.
- ATCC staff
To convert the host phenotype from URA3 to TRP1, transform with the Smal digested vector and select for Trp+ transformants. Vector was constructed by replacing an internal StuI fragment of URA3 with a Smal fragment containing the TRP1 and kanR coding sequences. TRP1 and URA3 are in the same orientation.

ATCC® Catalog No. 87557
Designation: M2371
Other name(s): HIS3 → ADE2 converter
Excise insert: Pstl+SacI
Size of construct (kb): 7.734
Markers: ampR ADE2
Growth temperature: 37°C
Growth medium: LB Medium + 50 µg/mL ampicillin

NOTES:
Restriction digests of the clone give the following sizes (kb): BamHI–3.7, 2.7, 0.7, 0.6; PvuI–6.8, 0.9; HindIII–3.9, 1.6, 1.2, 1.0.
- ATCC staff
To convert the host phenotype from HIS3 to ADE2, transform with the Pstl+SacI digested vector (4.99 kb) and select for Ade+ transformants. Vector was constructed by replacing an internal MscI-NsiI fragment of HIS3 with a 3.7 kb NotI (blunt)-Pstl fragment containing the ADE2 coding sequence. ADE2 and HIS3 are in the opposite orientation.

ATCC® Catalog No. 87558
Designation: M3499
Other name(s): URA3 → ADE2 converter
Excise insert: Pstl
Size of construct (kb): 7.426
Markers: ampR ADE2
Growth temperature: 37°C
Growth medium: LB Medium + 50 µg/mL ampicillin

NOTES:
Restriction digests of the clone give the following sizes (kb): HindIII–2.5, 1.3, 1.1 (doublet), 1.0; BamHI–6.6, 0.5; PvuI–6.2, 0.8.
- ATCC staff
To convert the host phenotype from URA3 to ADE2, transform with the Pstl digested vector (4.45 kb) and select for Ade+ transformants. Vector was constructed by replacing an internal StuI-EcoRV fragment of URA3 with a 3.7 kb BamHI fragment containing the ADE2 coding sequence. ADE2 and URA3 are in the same orientation.

ATCC® Catalog No. 87559
Designation: M2660
Other name(s): URA3 → LYS2
Excise insert: HindIII
Size of construct (kb): 8.308
Markers: ampR LYS2
Growth temperature: 37°C
Growth medium: LB Medium + 50 µg/mL ampicillin

NOTES:
Restriction digests of the clone give the following sizes (kb): BglII–4.3, 4.1; HindIII–5.6, 2.8; Hpal–8.5; PvuI–5.1, 2.4, 0.9.
- ATCC staff
To inactivate URA3, transform with HindIII-digested plasmid (5.57 kb) and select for Lys+. Constructed by
replacing an internal EcoRV-PstI fragment of URA3 with a 4.6 kb PvuII-PstI fragment containing LYS2. URA3 and LYS2 are in the same orientation.


Propagation

Transfer a loopful to a test tube containing 5 mL LB+ antibiotic (either 50 µg/mL of ampicillin 10 µg/mL chloramphenicol or 25 µg/mL chloramphenicol and 50 µg/mL kanamycin check specific markers). A loopful of culture can also be streaked on an LB + amp or chi agar plate. Incubate cultures at 37°C. Isolate DNA using standard plasmid preparation procedures.

Growth Conditions
Temperature: 37°C

References
References and other information relating to this product are available online at www.atcc.org.

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the current publication of the Biosafety in Microbiological and Biomedical Laboratories from the U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes for Health.

ATCC Warranty

The viability of ATCC® products is warranted for 30 days from the date of shipment, and is valid only if the product is stored and cultured according to the information included on this product information sheet. ATCC lists the media formulation that has been found to be effective for this strain. While other, unspecified media may also produce satisfactory results, a change in media or the absence of an additive from the ATCC recommended media may affect recovery, growth and/or function of this strain. If an alternative medium formulation is used, the ATCC warranty for viability is no longer valid.

Disclaimers

This product is intended for research use only. It is not intended for any animal or human therapeutic or diagnostic use.

If use of this culture results in a scientific publication, it should be cited in that manuscript in the following manner: (ATCC® 87561™)

Shipping Information

Frozen glycerol of Escherichia coli HB101 stocks containing the plasmids arrayed on a microtiter plate

Please see the enclosed Material Transfer Agreement (MTA) for further details regarding the use of this product. The MTA is also available on our Web site at www.atcc.org.

Additional information on this culture is available on the ATCC web site at www.atcc.org.

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