

***Helicobacter pylori* Gateway® Clone Set, Recombinant in *Escherichia coli*, Plate 6**

**Catalog No. NR-19482**

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**Contributor:**

Pathogen Functional Genomics Resource Center at the J. Craig Venter Institute

**Manufacturer:**

BEI Resources

**Product Description:**

The *Helicobacter pylori* (*H. pylori*) Gateway® clone set consists of approximately 1600 sequence validated clones from *H. pylori*, strain 26695 and strain J99 cloned in *Escherichia coli* (*E. coli*) DH10B-T1 cells. Each open reading frame was constructed in vector [pDONR™221](#) (Invitrogen™) with an ATG start codon and no stop codon. The sequence was validated by full length sequencing of each clone with greater than 1X coverage and a mutation rate of less than 0.2%. Detailed information about each clone is shown in Table 1.

Information related to the use of Gateway® Clones can be obtained from [Invitrogen™](#). Recombination was facilitated through an *attB* substrate (*attB*-PCR product or a linearized *attB* expression clone) with an *attP* substrate (pDONR™221) to create an *attL*-containing entry clone. The entry clone contains recombinational cloning sites, *attL1* and *attL2* to facilitate gene transfer into a destination vector, M13 forward and reverse priming sites for sequencing and a kanamycin resistance gene for selection. Please refer to the [Invitrogen™ Gateway® Technology Manual](#) for additional details.

**Material Provided:**

Each inoculated well of the 96-well plate contains approximately 60 µL of *E. coli* culture (strain DH10B-T1) in Luria Bertani (LB) Broth containing 50 µg/mL kanamycin supplemented with 15% glycerol.

**Note:** Production in the 96-well format has increased risk of cross-contamination between adjacent wells. Individual clones should be purified (e.g. single colony isolation and purification using good microbiological practices) and sequence-verified prior to use. BEI Resources cannot confirm or validate any clone not identified on the plate information table.

**Packaging/Storage:**

NR-19482 was packaged aseptically in a 96-well plate. The product is provided frozen and should be stored at -80°C or colder immediately upon arrival. For long-term storage, the

vapor phase of a liquid nitrogen freezer is recommended. Freeze-thaw cycles should be avoided.

**Growth Conditions:**

Media:

LB Broth or Agar containing 50 µg/mL kanamycin.

Incubation:

Temperature: *E. coli*, strain DH10B-T1 clones should be grown at 37°C.

Atmosphere: Aerobic

Propagation:

1. Scrape top of frozen well with a pipette tip and streak onto agar plate.
2. Incubate the plates at 37°C for 24 hours.

**Citation:**

Acknowledgment for publications should read “The following reagent was obtained through BEI Resources, NIAID, NIH: *Helicobacter pylori* Gateway® Clone Set, Recombinant in *Escherichia coli*, Plate 6, NR-19482.”

**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](#). 5th ed. Washington, DC: U.S. Government Printing Office, 2009; see [www.cdc.gov/biosafety/publications/bmbl5/index.htm](http://www.cdc.gov/biosafety/publications/bmbl5/index.htm).

**Disclaimers:**

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Two Unrelated Isolates of the Human Gastric Pathogen *Helicobacter pylori*." *Nature* 397 (1999): 176-180. PubMed: 9923682.

- Jungblut, P. R., et al. "Comparative Proteome Analysis of *Helicobacter pylori*." *Mol. Microbiol.* 36 (2000): 710-725. PubMed: 10844659.
- Tomb, J. F., et al. "The Complete Genome Sequence of the Gastric Pathogen *Helicobacter pylori*." *Nature* 388 (1997): 539-547. PubMed: 9252185.

**References:**

- Alm, R. A., et al. "Genomic-Sequence Comparison of

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**Table 1: *Helicobacter pylori* Gateway® Clone Set, Recombinant in *Escherichia coli*, Plate 6 (ZHPAF)<sup>1</sup>**

| Strain | Clone | Well Position | Locus ID | Description   | ORF Length | Accession Number            | Average Depth of Coverage |
|--------|-------|---------------|----------|---|------------|-----------------------------|---------------------------|
| 26695  | 57968 | A01           | HP1467   | hypothetical protein  | 730        | <a href="#">NP_208258.1</a> | 1.807                     |
| 26695  | 57974 | A02           | HP0325   | flagellar basal-body L-ring protein                                     | 748        | <a href="#">NP_207123.1</a> | 2                         |
| 26695  | 57979 | A03           | HP1102   | glucose-6-phosphate 1-dehydrogenase                                     | 718        | <a href="#">NP_207893.1</a> | 2                         |
| 26695  | 57983 | A04           | HP0585   | endonuclease III  | 691        | <a href="#">NP_207380.1</a> | 1.774                     |
| 26695  | 57987 | A05           | HP1000   | PARA protein  | 691        | <a href="#">NP_207791.1</a> | -                         |
| 26695  | 57990 | A06           | HP1053   | hypothetical protein  | 688        | <a href="#">NP_207844.1</a> | 2                         |
| 26695  | 57994 | A07           | HP1201   | ribosomal protein L1  | 739        | <a href="#">NP_207992.1</a> | 2                         |
| 26695  | 57999 | A08           | HP0565   | hypothetical protein  | 682        | <a href="#">NP_207360.1</a> | 1.699                     |
| 26695  | 58006 | A09           | HP0431   | protein phosphatase 2C homolog  | 721        | <a href="#">NP_207229.1</a> | 1.994                     |
| 26695  | 58010 | A10           | HP0097   | hypothetical protein  | 748        | <a href="#">NP_206897.1</a> | 2.099                     |
| 26695  | 58018 | A11           | HP0179   | ABC transporter, ATP-binding protein                                    | 676        | <a href="#">NP_206978.1</a> | 2                         |
| 26695  | 58024 | A12           | HP0553   | conserved hypothetical protein  | 718        | <a href="#">NP_207348.1</a> | 1.787                     |
| 26695  | 58026 | B01           | HP0350   | membrane protein, putative  | 703        | <a href="#">NP_207148.1</a> | 2                         |
| 26695  | 58030 | B02           | HP0843   | thiamin phosphate pyrophosphorylase/hydroxyethylthiazole kinase         | 694        | <a href="#">NP_207636.1</a> | 2                         |
| 26695  | 58034 | B03           | HP0004   | carbonic anhydrase  | 700        | <a href="#">NP_206806.1</a> | 1.994                     |
| 26695  | 58043 | B04           | HP0602   | endonuclease III  | 691        | <a href="#">NP_207397.1</a> | 1.994                     |
| 26695  | 58047 | B05           | HP1140   | biotin operon repressor/biotin acetyl coenzyme A carboxylase synthetase | 673        | <a href="#">NP_207931.1</a> | 2.529                     |
| 26695  | 58051 | B06           | HP1334   | hypothetical protein  | 709        | <a href="#">NP_208126.1</a> | 2                         |
| 26695  | 58055 | B07           | HP0374   | conserved hypothetical protein  | 715        | <a href="#">NP_207172.1</a> | 1.719                     |
| 26695  | 58058 | B08           | HP1477   | hypothetical protein  | 691        | <a href="#">NP_208268.1</a> | 3.09                      |
| 26695  | 58067 | B09           | HP0778   | hypothetical protein  | 718        | <a href="#">NP_207571.1</a> | 2.128                     |
| 26695  | 58076 | B10           | HP0539   | cag pathogenicity island protein  | 748        | <a href="#">NP_207335.1</a> | 1.811                     |
| 26695  | 58078 | B11           | HP1220   | ABC transporter, ATP-binding protein                                    | 721        | <a href="#">NP_208012.1</a> | 2.707                     |
| 26695  | 58082 | B12           | HP1231   | DNA polymerase III delta prime subunit                                  | 691        | <a href="#">NP_208023.1</a> | 2                         |
| 26695  | 58086 | C01           | HP0137   | hypothetical protein  | 670        | <a href="#">NP_206937.1</a> | 2                         |
| 26695  | 58091 | C02           | HP0986   | hypothetical protein  | 748        | <a href="#">NP_207777.1</a> | 1.676                     |
| 26695  | 58094 | C03           | HP0377   | thiol:disulfide interchange protein (dsbC), putative                    | 700        | <a href="#">NP_207175.1</a> | 2                         |

| Strain | Clone | Well Position | Locus ID | Description   | ORF Length | Accession Number            | Average Depth of Coverage |
|--------|-------|---------------|----------|---|------------|-----------------------------|---------------------------|
| 26695  | 58099 | C04           | HP1588   | conserved hypothetical protein                                    | 796        | <a href="#">NP_208379.1</a> | 2.367                     |
| 26695  | 58103 | C05           | HP1254   | biotin synthesis protein  | 757        | <a href="#">NP_208046.1</a> | 2                         |
| 26695  | 58114 | C06           | HP0361   | pseudouridylate synthase I  | 763        | <a href="#">NP_207159.1</a> | 3.077                     |
| 26695  | 58118 | C07           | HP1061   | conserved hypothetical integral membrane protein                  | 796        | <a href="#">NP_207852.1</a> | 1.936                     |
| 26695  | 58122 | C08           | HP0473   | molybdenum ABC transporter, periplasmic molybdate-binding protein | 775        | <a href="#">NP_207271.1</a> | 1.99                      |
| 26695  | 58130 | C09           | HP1343   | conserved hypothetical integral membrane protein                  | 763        | <a href="#">NP_208135.1</a> | 1.995                     |
| 26695  | 58134 | C10           | HP0484   | hypothetical protein  | 787        | <a href="#">NP_207281.1</a> | 2                         |
| 26695  | 58138 | C11           | HP0662   | ribonuclease III  | 757        | <a href="#">NP_207456.1</a> | 1.995                     |
| 26695  | 58142 | C12           | HP1071   | phosphatidylserine synthase                                       | 748        | <a href="#">NP_207862.1</a> | 2                         |
| 26695  | 58147 | D01           | HP0038   | hypothetical protein  | 772        | <a href="#">NP_206840.1</a> | 2                         |
| 26695  | 58151 | D02           | HP1285   | conserved hypothetical protein                                    | 772        | <a href="#">NP_208077.1</a> | 2.973                     |
| 26695  | 58154 | D03           | HP1437   | hypothetical protein  | 754        | <a href="#">NP_208228.1</a> | -                         |
| 26695  | 58159 | D04           | HP0677   | conserved hypothetical integral membrane protein                  | 802        | <a href="#">NP_207471.1</a> | 2                         |
| 26695  | 58166 | D05           | HP1372   | rod shape-determining protein                                     | 781        | <a href="#">NP_208163.1</a> | 2                         |
| 26695  | 58170 | D06           | HP0888   | iron(III) dicitrate ABC transporter, ATP-binding protein          | 802        | <a href="#">NP_207681.1</a> | 3.798                     |
| 26695  | 58174 | D07           | HP1214   | conserved hypothetical protein                                    | 757        | <a href="#">NP_208006.1</a> | 3.114                     |
| 26695  | 58179 | D08           | HP0388   | conserved hypothetical protein                                    | 766        | <a href="#">NP_207186.1</a> | 2.309                     |
| 26695  | 58184 | D09           | HP0265   | cytochrome c biogenesis protein                                   | 757        | <a href="#">NP_207063.1</a> | 1.456                     |
| 26695  | 58187 | D10           | HP0263   | adenine specific DNA methyltransferase                            | 793        | <a href="#">NP_207061.1</a> | 2                         |
| 26695  | 58194 | D11           | HP0814   | thiamin biosynthesis protein                                      | 802        | <a href="#">NP_207607.1</a> | 2                         |
| 26695  | 58198 | D12           | HP0394   | hypothetical protein  | 793        | <a href="#">NP_207192.1</a> | 1.748                     |
| 26695  | 58204 | E01           | HP1158   | pyrroline-5-carboxylate reductase                                 | 808        | <a href="#">NP_207949.1</a> | 2.182                     |
| 26695  | 58208 | E02           | HP0510   | dihydrodipicolinate reductase                                     | 799        | <a href="#">NP_207307.1</a> | 2.204                     |
| 26695  | 58210 | E03           | HP0101   | hypothetical protein  | 796        | <a href="#">NP_206901.1</a> | 2                         |
| 26695  | 58216 | E04           | HP1057   | hypothetical protein  | 757        | <a href="#">NP_207848.1</a> | 1.429                     |
| 26695  | 58222 | E05           | HP0503   | hypothetical protein  | 775        | <a href="#">NP_207300.1</a> | -                         |
| 26695  | 58226 | E06           | HP1032   | alternative transcription initiation factor, sigma-F              | 802        | <a href="#">NP_207822.1</a> | 1.99                      |
| 26695  | 58231 | E07           | HP0684   | flagellar biosynthesis protein, authentic frameshift              | 782        | <a href="#">NP_207478.1</a> | 2                         |
| 26695  | 58238 | E08           | HP0715   | ABC transporter, ATP-binding protein                              | 757        | <a href="#">NP_207509.1</a> | -                         |
| 26695  | 58242 | E09           | HP0549   | glutamate racemase  | 802        | <a href="#">NP_207344.1</a> | 2.377                     |
| 26695  | 58247 | E10           | HP1418   | UDP-N-acetylenolpyruvoylglucosamine reductase                     | 814        | <a href="#">NP_208209.1</a> | 2.676                     |
| 26695  | 58258 | E11           | HP0771   | membrane protein, putative  | 772        | <a href="#">NP_207564.1</a> | 3.443                     |
| 26695  | 58262 | E12           | HP0900   | hydrogenase expression/formation protein                          | 763        | <a href="#">NP_207693.1</a> | 2                         |
| 26695  | 58266 | F01           | HP0329   | NH(3)-dependent NAD+ synthetase                                   | 817        | <a href="#">NP_207127.1</a> | 4.169                     |
| 26695  | 58270 | F02           | HP0162   | conserved hypothetical protein                                    | 757        | <a href="#">NP_206961.1</a> | -                         |
| 26695  | 58274 | F03           | HP0739   | 2-hydroxy-6-oxohepta-2,4-dienoate hydrolase                       | 760        | <a href="#">NP_207533.1</a> | -                         |
| 26695  | 58280 | F04           | HP0446   | hypothetical protein  | 814        | <a href="#">NP_207244.1</a> | 2.157                     |
| 26695  | 58282 | F05           | HP1348   | 1-acyl-glycerol-3-phosphate acyltransferase                       | 757        | <a href="#">NP_208140.1</a> | 1.886                     |

| Strain | Clone | Well Position | Locus ID | Description   | ORF Length | Accession Number            | Average Depth of Coverage |
|--------|-------|---------------|----------|---|------------|-----------------------------|---------------------------|
| 26695  | 58292 | F06           | HP0940   | amino acid ABC transporter, periplasmic binding protein | 805        | <a href="#">NP_207732.1</a> | 1.785                     |
| 26695  | 58303 | F07           | HP0959   | conserved hypothetical protein                          | 766        | <a href="#">NP_207751.1</a> | 2                         |
| 26695  | 58306 | F08           | HP0139   | conserved hypothetical secreted protein                 | 763        | <a href="#">NP_206939.1</a> | -                         |
| 26695  | 58311 | F09           | HP0353   | flagellar export protein                                | 811        | <a href="#">NP_207151.1</a> | 2                         |
| 26695  | 58315 | F10           | HP0832   | spermidine synthase                                     | 823        | <a href="#">NP_207625.1</a> | 2                         |
| 26695  | 58318 | F11           | HP0191   | fumarate reductase, iron-sulfur subunit                 | 772        | <a href="#">NP_206990.1</a> | 2.364                     |
| 26695  | 58326 | F12           | HP1483   | gerC2 protein   | 775        | <a href="#">NP_208274.1</a> | 2.743                     |
| 26695  | 58330 | G01           | HP0173   | flagellar biosynthetic protein                          | 802        | <a href="#">NP_206972.1</a> | 3.066                     |
| 26695  | 58336 | G02           | HP0170   | hypothetical protein                                    | 796        | <a href="#">NP_206969.1</a> | 2.147                     |
| 26695  | 58340 | G03           | HP0164   | signal-transducing protein, histidine kinase            | 799        | <a href="#">NP_206963.1</a> | 1.87                      |
| 26695  | 58342 | G04           | HP0958   | hypothetical protein                                    | 799        | <a href="#">NP_207750.1</a> | 3.146                     |
| 26695  | 58351 | G05           | HP0871   | CDP-diglyceride hydrolase                               | 769        | <a href="#">NP_207665.1</a> | 2                         |
| 26695  | 58360 | G06           | HP1367   | type IIS restriction enzyme M1 protein                  | 817        | <a href="#">NP_208159.1</a> | 1.646                     |
| 26695  | 58367 | G07           | HP0357   | short chain alcohol dehydrogenase                       | 787        | <a href="#">NP_207155.1</a> | 2.277                     |
| 26695  | 58370 | G08           | HP0815   | flagellar motor rotation protein                        | 808        | <a href="#">NP_207608.1</a> | 3.059                     |
| 26695  | 58374 | G09           | HP0890   | conserved hypothetical protein                          | 805        | <a href="#">NP_207683.1</a> | 3.075                     |
| 26695  | 58378 | G10           | HP0069   | urease accessory protein                                | 799        | <a href="#">NP_206869.1</a> | 2                         |
| 26695  | 58383 | G11           | HP0916   | iron-regulated outer membrane protein                   | 784        | <a href="#">NP_207708.1</a> | 2                         |
| 26695  | 58387 | G12           | HP0466   | conserved hypothetical protein                          | 802        | <a href="#">NP_207264.1</a> | 2.581                     |
| 26695  | 58391 | H01           | HP1336   | hypothetical protein                                    | 796        | <a href="#">NP_208128.1</a> | 2                         |
| 26695  | 58396 | H02           | HP0861   | membrane protein, putative                              | 775        | <a href="#">NP_207655.1</a> | 1.508                     |
| 26695  | 58398 | H03           | HP0530   | cag pathogenicity island protein                        | 793        | <a href="#">NP_207326.1</a> | 2                         |
| 26695  | 58402 | H04           | HP0842   | hypothetical protein                                    | 772        | <a href="#">NP_207635.1</a> | 1.995                     |
| 26695  | 58411 | H05           | HP1573   | conserved hypothetical protein                          | 799        | <a href="#">NP_208364.1</a> | 2.09                      |
| 26695  | 58415 | H06           | HP1526   | exodeoxyribonuclease                                    | 787        | <a href="#">NP_208316.1</a> | 2                         |
| 26695  | 58422 | H07           | HP0040   | hypothetical protein                                    | 778        | -                           | 1.961                     |
| 26695  | 58426 | H08           | HP0193   | fumarate reductase, cytochrome b subunit                | 802        | <a href="#">NP_206992.1</a> | 1.648                     |
| 26695  | 58430 | H09           | HP0102   | conserved hypothetical protein                          | 814        | <a href="#">NP_206902.1</a> | 2                         |
| 26695  | 58434 | H10           | HP0324   | outer membrane protein                                  | 799        | <a href="#">NP_207122.1</a> | 2                         |
| 26695  | 58439 | H11           | HP1465   | ABC transporter, ATP-binding protein                    | 820        | <a href="#">NP_208256.1</a> | 1.888                     |
| 26695  | 58443 | H12           | HP0073   | urease, alpha subunit                                   | 751        | <a href="#">NP_206873.1</a> | 2                         |

<sup>1</sup>All information in this table was provided by J. Craig Venter Institute at the time of deposition.