Bacillus Megaterium Expression System

“...one of the most efficient expression systems described in any organism so far”

Efficient tool for small to industrial-scale protein production

- Stable, high-yield protein production in Bacillus megaterium
- Ideal for both small and large-scale protein production
- Tightly regulated & efficiently inducible xyLA operon (up to 350x)
- No alkaline proteases activity and no endotoxins observed
- Versatile cloning (extended multiple cloning site)
- Versatile production (intracellular and extracellular)
- Versatile purification (6xHis-tag, Strep-tag, Strep/6xHis double-tag)
- Compatible with all B. subtilis vectors

Left: Original B. megaterium shuttle vector pWH1520. New vectors are also available with DNA sequences for 6xHis- and Strep-tags both separately and in combination. Additionally, the sequence for the signal peptide of the extracellular esterase LipA is introduced for secretion of heterologous proteins. An extended polylinker region allows the cloning without modifying the original N-terminus of the target protein.
**Product Description**

The *B. megaterium* expression system provides a versatile and easy-to-handle tool for stable and high-yield protein production, both small and large scale. *B. megaterium* has proven to be an excellent alternative host to *E. coli* for heterologous gene expression. Unlike other bacilli strains, proteolytic degradation by alkaline proteases is avoided and no endotoxins are produced.

**High Protein Yield**

Protein yields are exceptionally high even if inexpensive substrates are used. For example, the proteins mutarotase (Mro) and glucose dehydrogenase (Gdh) have been accumulated up to 20% and 30% of the total soluble protein, respectively. Using the tightly regulated xylose inducible promoter, gene expression was induced 130- to 350-fold without proteolysis.

**Versatile System with a Wide Range of Vectors**

MoBiTec provides a wide range of excellent vectors for the *B. megaterium* system that are adaptable to most applications and protein purification methods. The vectors, developed by Prof. Dr. D. Jahn at the Institute for Microbiology in Braunschweig, Germany, carry a secretion signal peptide sequence, a 6xHis-tag, a Strep-tag, or a Strep/6xHis double-tag. Additionally, all vectors contain the tightly regulated xylose inducible promoter.

**Protoplasts specifically optimized for Transformation**

The protoplasts supplied by MoBiTec are from *B. megaterium* strain WH320 developed by Prof. Dr. W. Hillen at the Institute of Microbiology in Erlangen, Germany. These protoplasts are prepared according to an optimized protocol resulting in the highest transformation efficiencies.

**ORDER INFORMATION**

<table>
<thead>
<tr>
<th>Order #</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMEG02</td>
<td><em>B. megaterium</em> protoplasts ready for transformation (strain WH320); sufficient for 4 transformations plus control experiment.</td>
<td>5 x 500 µl</td>
</tr>
<tr>
<td>BMEG03</td>
<td>pWH1520 shuttle vector, original; lyophilized DNA.</td>
<td>5 µg</td>
</tr>
<tr>
<td>BMEG10</td>
<td>pMM1522 shuttle vector, improved; lyophilized DNA.</td>
<td>10 µg</td>
</tr>
<tr>
<td>BMEG11</td>
<td>pMM1525 shuttle vector with signal sequence SP_{6His}, lyophilized DNA.</td>
<td>10 µg</td>
</tr>
<tr>
<td>BMEG12</td>
<td>pHS1522 shuttle vector, 6xHis-tagged; lyophilized DNA.</td>
<td>10 µg</td>
</tr>
<tr>
<td>BMEG13</td>
<td>pHS1525 shuttle vector with signal sequence SP_{6His}, 6xHis-tagged; lyophilized DNA.</td>
<td>10 µg</td>
</tr>
<tr>
<td>BMEG14</td>
<td>pSTREP1525 shuttle vector with signal sequence SP_{Strep}, Strep-tagged; lyophilized DNA.</td>
<td>10 µg</td>
</tr>
<tr>
<td>BMEG15</td>
<td>pSTREPISH1525 shuttle vector with signal sequence SP_{Strep/6xHis}, Strep/6xHis double-tagged; lyophilized DNA.</td>
<td>10 µg</td>
</tr>
</tbody>
</table>

**SHIPPING & STORAGE:** DNA shipped at RT, protoplasts shipped on dry ice.

Lyophilized vectors stored at 4°C, reconstituted vectors at -20°C, protoplasts at -70°C.

---

Selected proteins successfully over-produced in bacilli strains with our *B. megaterium* vectors:
- β-Galactosidase (LacZ)^1
- Catabolite control protein (CcpA)^2,3
- Clostridium difficile toxin A^4
- Cobaltochelatase (CbiX)^5
- Dextranucrase (DsrS)^6
- Endolevanase (LevB)^7
- Glucose dehydrogenase (GdhA)^1
- Heat shock protein (HPr) from PTS^8
- Human sc urokinase-like plasminogen activator (rscuPA)^1
- Levansucrase (Lev)^9
- Mutarotase (Mro)^1
- Neopullulanase^10
- Pyruvate decarboxylase^11
- Translocation ATPase (SecA)^12
- Trehalose repressor (TreR)^13

---