# Shuttle Vector

## An Expression Vector for Gram(+) and Gram(-) Prokaryotes

### Invention

The heterologous expression of genes in prokaryotes can be challenging, especially if the genes originate from a distant host or if the source is uncertain, such as a metagenomic expression library. Many vectors have been developed based on broad host range origins of replication, but these tend to focus on either gram(+) or gram(-) prokaryotes.

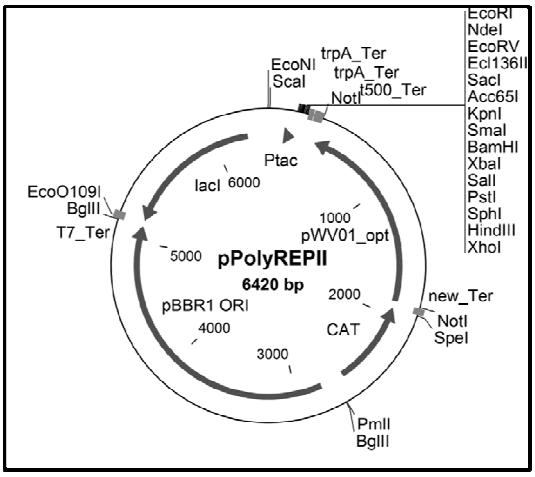


Fig.: pPolyREPII

This invention regards the construction of a completely synthetic expression vector, namely pPolyREPII, based on both the pBBR1 (for gram-positive) and pWV01 (for gram-negative) origin of replication, allowing replication in both types of organisms.

The expression of pPolyREPII was assessed by cloning the gfp gene with a $His_6$ tag sequence. A strong gfp expression could be observed in various prokaryotes, such as *E.coli* DH5α, *Pseudomonas putida* KT2440 and *Bacillus subtilis* 168. The presence of GFP was confirmed by western blot analysis using antibodies against $His_6$ tag.

This novel broad host range expression vector can be equally well used in gram(+) and gram(-) hosts. Thus, this new tool may be used to establish environmental DNA (eDNA) expression libraries and to screen for desired activities in different gram(+) as well as gram(-) hosts at the same time. The vector may allow finding novel biocatalysts, which are not functional in the limited number of vector compatible hosts so far.

### Commercial Opportunities

The present invention provides a novel broad host range expression vector for establishing expression libraries with unknown DNA sequences like eDNA libraries.

### Current Status

PROvendis offers access to rights for commercial use. In case of interest we will be pleased to inform you about the current patent status.

### Relevant Publication

Paper submitted.

An invention of the Westfaelische Wilhelms-University of Muenster (UniMuenster).

### Competitive Advantages

- **Broad host range vector enables to use gram(+) and gram(-) hosts at the same time for expression**
- **Suitable for the establishment of expression libraries with unknown DNA (e.g. environmental DNA)**
- **Might be a new way to find novel biocatalysts**

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