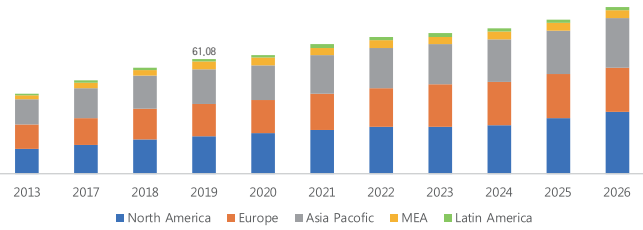


# Recombinant *Mycobacterium smegmatis* as an anticancer immunotherapy

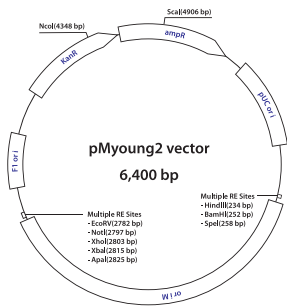
## Cancer immunotherapy Market size, by region-2016-2026



\*Source : polarismarketresearch.com

## pMyong2 Vector

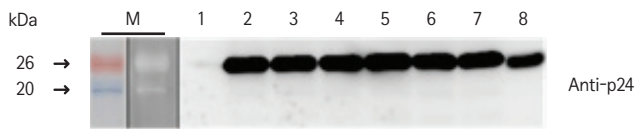
A novel *Escherichia coli* - *Mycobacterium* shuttle vector



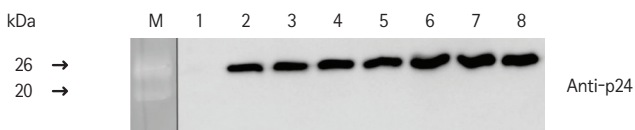
- Backbone: pCR2.1 vector
- Size: 6,400 bp
- Generation by insertion Ori region from *Mycobacterium yongonense* (DSM 45126T) plasmid pMyong2, which include replicon and rep gene

### 1. Stability

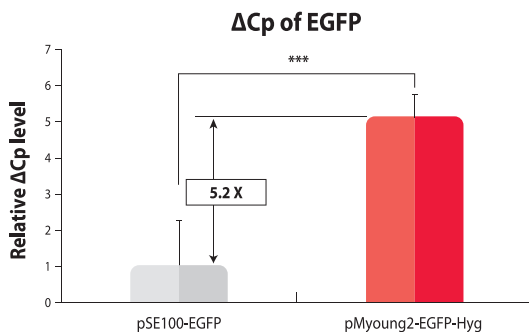
#### In *M. smegmatis*



#### In *M. bovis* BCG

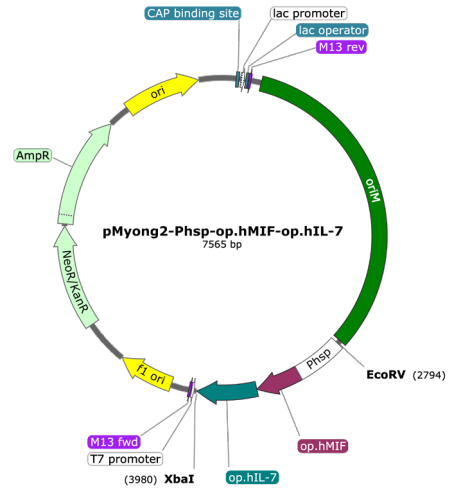


### 2. High Copy Number



### 3. Stable Expression of Exogenous Genes

## Target construct



### IL-7

- T cell development and maintain and restoring homeostasis of mature T cells
- 154 aa, 17.7kD
- Important in Naive T cell and memory T cell development, TCR diversity
- A lot of Clinical trials using IL-7 against various solid tumors

### MIF

- Macrophage Migration Inhibitory Factor, - homotrimeric molecule
- 115 aa, 12.5kD
- Important regulator of innate immunity
- Acting as a tumor antigen

## Relative Patents

Shuttle vectors for *Mycobacteria-Escherichia coli* and uses thereof.

Korea and USA (Patent No., 10-1291668 and US 8,841,432 B2)

|  |   |
|--|---|
| (10) 대한민국특허청(KR)<br>(11) 등록번호 10-1291668<br>(12) 등록일자 2013년09월04일<br>(13) 등록일자 2013년09월04일 | (40) 공고일자 2013년09월04일<br>(41) 공개일자 2013년09월04일<br>(42) 등록일자 2013년09월04일 |
| (19) 대한민국특허청(KR)<br>(11) 등록번호 10-1291668<br>(12) 등록일자 2013년09월04일<br>(13) 등록일자 2013년09월04일 | (40) 공고일자 2013년09월04일<br>(41) 공개일자 2013년09월04일<br>(42) 등록일자 2013년09월04일 |

|   |  |
|---|--|
| (12) United States Patent<br>Kim et al.   | (10) Patent No.2<br>US 8,841,432 B2<br>(45) Date of Patent: Sep. 23, 2014          |
| (54) SHUTTLE VECTORS FOR MYCOBACTERIAL TRANSFORMATION OF ESCHERICHIA COLI AND USE THEREOF | (57) Abstract: Shuttle vectors for Mycobacteria-Escherichia coli and uses thereof. |

Recombinant *Mycobacterium smegmatis* and *M. bovis* BCG transfected with a pMyong2 vector system expressing human immunodeficiency virus Type I Gag and vaccine comprising the same. Korea. (Patent No., 10-2014518)

