pBR322

pBR322 is a commonly used cloning vector in *E. coli* and has tremendous applications in cloning.

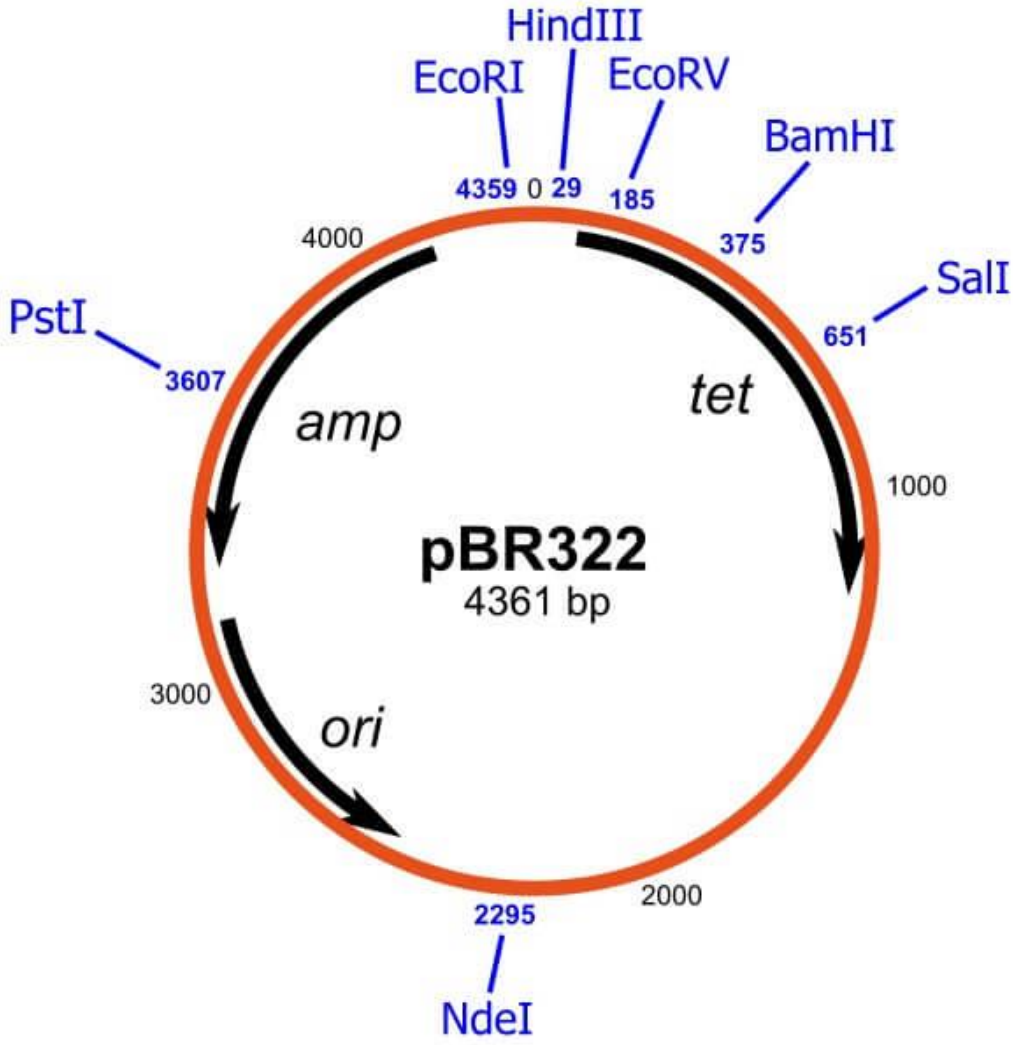
pBR322 full form

p = plasmid

BR = **B**olivar, and **R**odriguez

322 = numerical designation

- It was constructed in 1977 in the lab of Herbert Boyer at The University of California in San Francisco.
- It is a synthetic plasmid and was the first artificial plasmid to be constructed and used as a cloning vector.
- pBR322 is one of the most studied plasmids.
- It is 4362 base pairs long.
- It is completely sequenced, which means the whole sequence of pBR322 is known and studied.



pBR322 Vector.

Restriction enzyme sites

- Around 40 different restriction sites are present on the genome of pBR322.
- Almost 11 different restriction sites are present in the region of tetracycline resistance region.
- In the ampicillin resistance region 9 restriction sites of different enzymes are present.
- Some of the known restriction enzyme sites are – BamHI, HindIII, EcoRI, SaII, and many more.

Selectable marker sites

Two selectable marker sites or antibiotic resistance genes are present on the genome of this plasmid.

- Ampicillin resistance site – the ampicillin gene codes for β-lactamase, which can be used for screening microorganisms when a foreign DNA is being inserted in the plasmid.
- Tetracycline resistance site – this gene degrades the antibiotic tetracycline and can be used for screening microorganisms.
- These antibiotic resistance genes are useful in screening organisms after cloning.

Advantages of pBR322

- Due to its manageable size, plasmid pBR322 is widely used as a cloning vector.
- The presence of two antibiotic resistance genes eases the selection process of recombinants.
- Multiple restriction enzyme sites make the plasmid compatible in many ways.
- It has a high copy number which is highly favorable in genetic engineering.