

Restriction-modification system

Typel R-M system

The hsd(host specificity defective) consists of flanking genes of hsdR, hsdM and hsdS, they have function of restriction, modification and recognition, respectively.

Properties

- Hetero complex enzyme consisting of 3 subunits
- Modification system have a methyltransferase activity that requires [S-Adenosylmethionine](#) as a donor of methyl group.
- Restriction system requires [ATP](#) and Mg^{2+} .
- The site of recognition is distant from that of digestion.

Typell R-M system

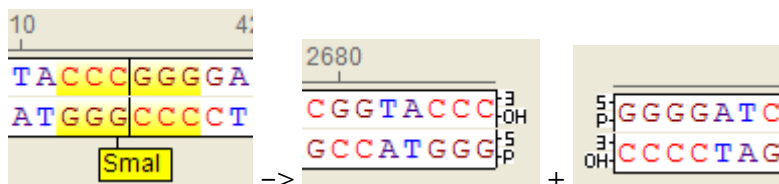
Commercially available restriction enzymes belong to Typell restriction-modification system. They can cut dsDNA without its associating methylase.

Properties

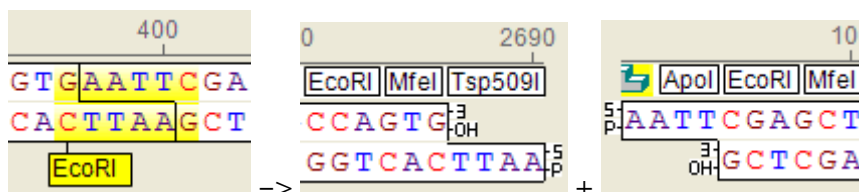
- Restriction subunit and modification subunit are active itself.
- Restriction system requires Mg^{2+} .
- Restriction system cuts within its recognition site.

Reactions

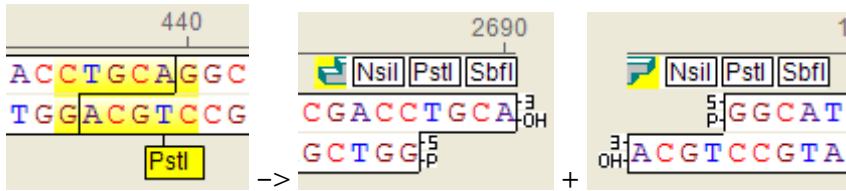
producing blunt ends



producing 5'-sticky ends



producing 3'-sticky ends



Reference

- [Type I restriction systems: sophisticated molecular machines \(a legacy of Bertani and Weigle\)](#).
Murray NE
Microbiol Mol Biol Rev 64p412-34(2000 Jun)

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Last update: 2013/06/09 10:10

