GENE BRIDGES
DNA ENGINEERING SPECIALISTS

TECHNICAL PROTOCOL

FOR

# Arabinose inducible prokaryotic recombinase expression plasmid

# pSC101-BAD-Cre (A301)
# pSC101-BAD-Dre (A302)

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## 1 Eppendorf tubes + manual

1. recombinase expression plasmid pSC101-BAD-Cre or pSC101-BAD-Dre (0.2 µg/µl, 20 µl)

2. This manual

**Store tube at -20℃**

## Please read

The products listed in this manual are for research purposes only. They are not designed for diagnostic or therapeutic use in humans, animals or plants.

## MTA

The use of **Dre recombinase is covered by United States Patent Nos. 7,422,889 and 7,915,037 owned by the Stowers Institute for Medical Research, Kansas City, Missouri.** Non-profit and academic institutions have permission to use the plasmid solely for research purpose; for-profit entities require a license from Stowers Institute.

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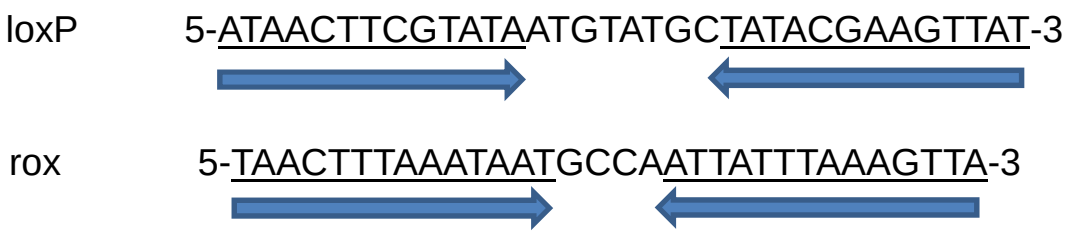
## Short Description:

Site-specific recombinases (SSRs) like Cre or Dre are valuable tools in functional genomics and have been applied in various organisms. They mediate recombination between target sites of 32-34 base pairs (bp) in length. The target sites, which are called loxP or rox sites are 13-14 bp palindromes separated by spacers (s. below).




Recognition sites of the site-specific recombinases Cre and Dre.

Cre recombinase, which was originally isolated from coliphage P1, mediates recombination between two loxP-sites through the spacer regions (e.g. removal of selectable genes). Dre was identified in a systematic search through P1-like phages for a Cre-like enzyme that had diverged sufficiently to recognize a recombination target site ( RT) that is distinct from loxP (Sauer and Mc Dermott, 2004).

The combination of the arabinose inducible BAD promoter and the low-copy pSC101 plasmid backbone provide an excellent on-off regulation of Cre or Dre in *E. coli* as proved in a test experiment (Anastassiadis et al. 2009).

The plasmids carry a tetracyclin resistance gene for selection and are compatible with plasmids based on a ColE1 or p15A origin of replication and an ampicillin or kanamycin resistance marker.

While Cre/loxP is widely used in mouse genetics for conditional mutagenesis with many mouse lines available, a second highly efficient system like Dre/rox opens the door for more complex tasks such as a conditional mutagenesis of alternatively spliced exons. Cre/loxP can be used to remove one alternative exon and Dre/rox to remove the other one.

## Literature:


- Anastassiadis K., Fu J., Patsch C., Hu S., Weidlich S., Duerschke K., Buchholz F., Edenhofer F. and Stewart A.F. 2009: Dre recombinase, like Cre, is a highly efficient site-specific recombinase in E. coli, mammalian cells and mice. Disease Models & Mechanisms 2: 508 - 515.
- Sauer B. and Mc Dermott J., 2004: DNA recombination with a heterospecific Cre homolog identified from comparison of the *pac-c1* regions of P1-related phages. Nucleic Acids Research 32: 6086 – 6095.


## Maps: