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# Cloning shRNA Oligos into pLKO.1 V.2

Addgene The Nonprofit Plasmid Repository[1]

[1]Addgene

1 Works for me dx.doi.org/10.17504/protocols.io.bawmifc6

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ABSTRACT

This is the protocol accompanying the "pLKO.1 – TRC Cloning Vector". For information about the PLKO.1-TRC cloning vector and tips on designing shRNA oligos for pLKO.1 see Addgene's website: http://www.addgene.org/tools/protocols/plko/

EXTERNAL LINK

http://www.addgene.org/tools/protocols/plko/

STEPS MATERIALS

| NAME | CATALOG # | VENDOR |
|---|---|---|
| NEBuffer 3 - 5.0 ml | B7003S | New England Biolabs |
| NEBuffer 1 - 5.0 ml | B7001S | New England Biolabs |
| AgeI - 300 units | R0552S | New England Biolabs |
| EcoRI - 10,000 units | R0101S | New England Biolabs |
| EcoRI - 10,000 units | R0101S | New England Biolabs |
| T4 DNA Ligase Reaction Buffer - 6.0 ml | B0202S | New England Biolabs |
| T4 DNA Ligase - 20,000 units | M0202S | New England Biolabs |

## Annealing Oligos

1 Resuspend oligos in ddH2O to a concentration of 20 µM.

2 Add 5ul Forward oligo

**5 µl**

3 Add 5ul Reverse oligo

**5 µl**

4 Add 5 µL 10x NEB buffer 2

**5 µl**

NEBuffer 3 - 5.0 ml
by New England Biolabs
Catalog #: B7003S

5 Add 35 µL ddH2O

**35 µl**

6 Incubate for 4 minutes at 95°C in a PCR machine or in a beaker of boiling water.

**00:04:00**

7 Incubate the sample at 70°C for 10 minutes in a PCR machine.

**00:10:00**

8 Slowly cool to room temperature over the period of several hours.

**03:00:00**

This will take a few hours, but it is important for the cooling to occur slowly for the oligos to anneal.

If using a beaker of water, remove the beaker from the flame, and allow the water to cool to room temperature.

## Digesting pLKO.1 TRC Cloning Vector

9 Mix: 6 µg pLKO.1 TRC-cloning vector (maxiprep or miniprep DNA)

**6 µg**

10 with 5 µL 10x NEB buffer 1

**5 µl**

NEBuffer 1 - 5.0 ml
by New England Biolabs
Catalog #: B7001S

11 with 1 µL AgeI

**1 µl**

AgeI - 300 units
by New England Biolabs
Catalog #: R0552S

12 bring to 50 µL ddH2O

**50 µl**

13 Incubate at 37°C for 2 hours.

**02:00:00**

14 Purify with Qiaquick gel extraction kit, eluting in 30 µL of ddH2O.

15 Digest eluate with EcoRI by mixing: 30 µL pLKO.1 TRC-cloning vector digested with AgeI

16 with 5 µL 10x NEB buffer for EcoRI

**5 µl**

EcoRI - 10,000 units
by New England Biolabs
Catalog #: R0101S

17 with 1 µL EcoRI

**1 µl**

EcoRI - 10,000 units
by New England Biolabs
Catalog #: R0101S

18 and 14 µL ddH2O

**14 µl**

19 Incubate at 37°C for 2 hours.

**02:00:00**

20 Run digested DNA on 0.8% low melting point agarose gel until you can distinctly see 2 bands, one 7kb and one 1.9kb.

When visualizing DNA fragments to be used for ligation, use only long-wavelength UV light. Short wavelength UV light will increase the chance of damaging the DNA.

21 Cut out the 7kb band and place in a sterile microcentrifuge tube.

22 Purify the DNA using a Qiaquick gel extraction kit. Elute in 30 µL of ddH2O.

23 Measure the DNA concentration.

## Ligating and Transforming into Bacteria

24 Use your ligation method of choice. For a standard T4 ligation, mix: 2 µL annealed oligo from "Annealing Oligos" section above.

**2 µl**

25 With 20 ng digested pLKO.1 TRC-cloning vector from the "Digesting pLKO.1 TRC Cloning Vector" section above.

**20 ng**

If you were unable to measure the DNA concentration, use 1 µL

26 With 2 µL 10x NEB T4 DNA ligase buffer

**2 µl**

T4 DNA Ligase Reaction Buffer - 6.0 ml
by New England Biolabs
Catalog #: B0202S

27 With 1 µL NEB T4 DNA ligase

**1 µl**

T4 DNA Ligase - 20,000 units
by New England Biolabs
Catalog #: M0202S

28 Bring up to 20ul with ddH2O

29 Incubate at 16°C for 4-20 hours.

**04:00:00**

30 Transform 2 µL of ligation mix into 25 µL competent DH5 alpha cells, following manufacturer's protocol.

31 Plate on LB agar plates containing 100 µg/mL ampicillin or carbenicillin (an ampicillin analog).