

# Tagetin™ RNA Polymerase Inhibitor

Cat. Nos. T9705H, T9701K, and T9702K

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## 1. Introduction

First discovered as a bacterial phytotoxin that induced chlorosis in plants, Tagetin™ RNA Polymerase Inhibitor is the only compound known to potently and selectively inhibit RNA polymerase III from a variety of eukaryotic organisms, including mammalian cells, *Saccharomyces cerevisiae*, *Drosophila melanogaster*, *Bombyx mori*, and *Xenopus laevis* oocytes.<sup>1</sup> It strongly inhibits *E. coli* RNA polymerase and plant chloroplast RNA polymerase. Phage-encoded RNA Polymerases, such as SP6 or T7,<sup>2</sup> and plant nuclear RNA polymerases, are relatively insensitive to Tagetin activity.<sup>3</sup>

Tagetin RNA Polymerase Inhibitor complements the activity of  $\alpha$ -amanitin, a potent and selective inhibitor of eukaryotic RNA polymerase II. Although the precise mechanism of inhibition is not known, studies with yeast nuclear extracts indicate that the effect is due to increased pausing of the elongation complex at discrete points along the DNA template.<sup>4</sup>

## 2. Product Specifications

**Storage:** Store at 4°C.

**Storage Buffer:** Tagetin RNA Polymerase Inhibitor is supplied in sterile deionized water.

**Concentration:** Tagetin RNA Polymerase Inhibitor is available in 500-, 1,000-, and 5,000-U sizes at 20 U/ $\mu$ l (600 pmol/ $\mu$ l, 600  $\mu$ M). 1 U is equal to 30 pmol.

**Molecular Weight:** 416 Daltons.

**Unit Definition:** One unit inhibits 50% of the activity of one unit of *E. coli* RNA polymerase holoenzyme. One unit of *E. coli* RNA polymerase catalyzes the incorporation of 1 nmol of labeled UTP into an acid-insoluble form in 10 minutes at 37°C.

**Activity Assay:** The activity assay is performed in a reaction containing 40 mM Tris-HCl (pH 7.5), 150 mM KCl, 10 mM MgCl<sub>2</sub>, 0.1% Triton® X-100, 10 mM dithiothreitol, 0.5 mM each of ATP, GTP, CTP, and <sup>3</sup>H-UTP, 1  $\mu$ g of phage T7 DNA template, 1.0 U of *E. coli* RNA polymerase, and varying amounts of Tagetin RNA Polymerase Inhibitor.

**Contaminating Activity Assays:** Tagetin RNA Polymerase Inhibitor is free of detectable DNA exo- and endonuclease, and RNase activities.

## 3. Related Products

The following products are also available:

- *E. coli* RNA Polymerase Core Enzyme
- *E. coli* RNA Polymerase Holoenzyme
- NTP Solutions

## 4. References

1. Steinberg, T.H. *et al.*, (1990) *J. Biol. Chem.* **265**, 499.
2. Matthews, D.E. and Durbin, R.D. (1990) *J. Biol. Chem.* **265**, 493.
3. Lukens, J.H. *et al.*, (1987) *Plant Physiol.* **84**, 808.
4. Steinberg, T.H. and Burgess, R.R. (1992) *J. Biol. Chem.* **267**, 20204.

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