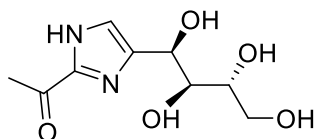


# PRODUCT DATA SHEET

## 2-Acetyl-4-(1R,2S,3R,4-tetrahydroxybutyl)-imidazole

**Catalog No:** 1858  
**Common Name:** THI  
**Source:** synthetic  
**Solubility:** DI water  
**CAS No:** 94944-70-4

**Molecular Formula:** C<sub>9</sub>H<sub>14</sub>N<sub>2</sub>O<sub>5</sub>  
**Molecular Weight:** 230  
**Storage:** -20°C  
**Purity:** HPLC, MS, NMR >99%  
**Appearance:** solid



### Application Notes:

2-Acetyl-4-(1R,2S,3R,4-tetrahydroxybutyl)-imidazole (THI) is an inhibitor of sphingosine-1-phosphate lyase (S1P lyase). In high doses it leads to the inhibition of S1P lyase, causing an accumulation of sphingosine-1-phosphate and a decrease in the activity of sphingosine-1-phosphate receptor-1. This results in lymphopenia (depression of blood lymphocyte counts) as well as an immune deficiency.<sup>1</sup> THI does not appear to have any toxic effects and may therefore be valuable as an immunosuppressive drug. Diabetes can occur spontaneously due to autoimmune insulinitis and THI has been proposed as a possible treatment for the prevention of this disease.<sup>2</sup> It is thought that THI and Pyridoxine (vitamin B<sub>6</sub>) may compete for the same binding site as an additional diet of pyridoxine can prevent the decrease of blood lymphocyte counts caused by THI. THI has a structural similarity to histamine and urocanic acid, both known to have immunosuppressive properties.<sup>3</sup> THI is a minor component of the food additive caramel color III.

### Selected References:

1. S. Gobin, J. Philips "Immunosuppressive effects of 2-acetyl-4-tetrahydroxybutylimidazole (THI) in the rat" *Clin. Exp. Immunol.*, Vol. 85 pp. 335-340, 1991
2. S. Schwab et al. "Lymphocyte Sequestration Through S1P Lyase Inhibition and Disruption of S1P Gradients" *Science*, Vol. 309(5741) pp. 1735-1739, 2005
3. T. Mandel, M. Koulmanda, and I. Mackay "Prevention of spontaneous and cyclophosphamide-induced diabetes in non-obese diabetic (NOD) mice with oral 2-acetyl-4-tetrahydroxybutylimidazole (THI), a component of caramel colouring III" *Clin Exp Immunol.*, Vol. 88(3) pp. 414-419, 1992

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