

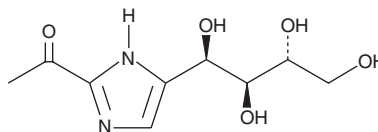
# Product Information



## 2-Acetyl-5-tetrahydroxybutyl Imidazole

Item No. 13222

**CAS Registry No.:** 94944-70-4  
**Formal Name:** 1-[5-[(1R,2S,3R)-1,2,3,4-tetrahydroxybutyl]-1H-imidazol-2-yl]-ethanone  
**Synonyms:** 2-Acetyl-4-tetrahydroxybutyl-Imidazole, 2-ATHBI, THI  
**MF:** C<sub>9</sub>H<sub>14</sub>N<sub>2</sub>O<sub>5</sub>  
**FW:** 230.2  
**Purity:** ≥95%  
**Stability:** ≥2 years at -20°C  
**Supplied as:** A crystalline solid  
**UV/Vis.:** λ<sub>max</sub>: 288 nm



### Laboratory Procedures

For long term storage, we suggest that 2-acetyl-5-tetrahydroxybutyl imidazole (THI) be stored as supplied at -20°C. It should be stable for at least two years.

THI is supplied as a crystalline solid. A stock solution may be made by dissolving the THI in the solvent of choice. THI is soluble in organic solvent DMSO which should be purged with an inert gas. The solubility of THI in these solvents is approximately 2 mg/ml. Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of THI can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of THI in PBS, pH 7.2, is approximately 0.15 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Sphingosine-1-phosphate (S1P) lyase catalyzes the irreversible decomposition of S1P to hexadecanaldehyde and phosphoethanolamine. THI is an inhibitor of S1P lyase.<sup>1</sup> Because S1P lyase is primarily expressed in lymphatic tissue, treatment of mice with THI (50 µg/ml in drinking water) increases lymphoid tissue S1P concentrations 100-fold, reducing lymphocyte egress from thymus and peripheral lymphoid organs.<sup>1,2</sup> The resulting lymphopenia is reversible following cessation of THI treatment.<sup>3</sup> Reducing S1P lyase activity results in therapeutic levels of immunosuppression without the non-lymphoid lesions that result from synthetic S1P receptor agonists.<sup>4</sup>

### References

1. Schwab, S.R., Pereira, J.P., Matloubian, M., *et al.* Lymphocyte sequestration through S1P lyase inhibition and disruption of S1P gradients. *Science* **309**, 1735-1739 (2005).
2. Gugasyan, R., Coward, A., O'Connor, L., *et al.* Emigration of mature T cells from the thymus is inhibited by the imidazole-based compound 2-acetyl-4-tetrahydroxybutylimidazole. *Immunology* **93**, 398-404 (1998).
3. Bradbury, M.G., Doherty, K.V., Parish, C.R., *et al.* The immunosuppressive compound 2-acetyl-4-tetrahydroxybutyl imidazole inhibits the allogeneic mixed lymphocyte reaction by sequestration of a recirculating subpopulation of T cells. *Immunology* **87**, 80-85 (1996).
4. Vogel, P., Donoviel, M.S., Read, R., *et al.* Incomplete inhibition of sphingosine 1-phosphate lyase modulates immune system function yet prevents early lethality and non-lymphoid lesions. *PLoS One* **4**(1), (2009).

### Related Products

S1P Lyase Fluorogenic Substrate - Item No. 13238 • Hexadecanal-d<sub>5</sub> - Item No. 16834 • Sphingosine-1-phosphate - Item No. 62570

**WARNING: THIS PRODUCT IS FOR LABORATORY RESEARCH ONLY. NOT FOR ADMINISTRATION TO HUMANS. NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.**

#### MATERIAL SAFETY DATA

This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, or inhale. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. This information contains some, but not all, of the information required for the safe and proper use of this material. Before use, the user must review the complete Material Safety Data Sheet, which has been sent via email to your institution.

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