

# PRODUCT INFORMATION



## Citrinin-<sup>13</sup>C<sub>13</sub> Item No. 31296

**Formal Name:** (3R,4S)-8-hydroxy-3,4,5-tri(methyl-<sup>13</sup>C)-6-oxo-4,6-dihydro-3H-isochromene-7-carboxylic-<sup>13</sup>C<sub>9</sub> acid

**Synonyms:** (-)-Citrinin-<sup>13</sup>C<sub>13</sub>, CTN-<sup>13</sup>C<sub>13</sub>

**MF:** [<sup>13</sup>C]<sub>13</sub>H<sub>14</sub>O<sub>5</sub>

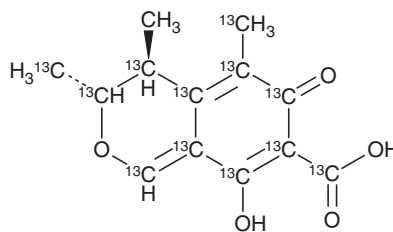
**FW:** 263.2

**Purity:** ≥98%

**Supplied as:** A 10 µg/ml solution in acetonitrile

**Storage:** -20°C

**Stability:** ≥2 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Description

Citrinin-<sup>13</sup>C<sub>13</sub> is intended for use as an internal standard for the quantification of citrinin (Item No. 11320) by GC- or LC-MS. Citrinin is a mycotoxin that has been found in *Monascus* and has diverse biological activities.<sup>1-4</sup> It is active against *S. aureus*, methicillin-resistant *S. aureus* (MRSA), rifampicin-resistant *S. aureus*, and vancomycin-resistant *E. faecium* (MICs = 1.95, 3.9, 0.97, and 7.81 µg/ml, respectively), as well as the pathogenic yeast *C. neoformans* (MIC = 3.9 µg/ml).<sup>2</sup> It is cytotoxic to a variety of cells *in vitro*, including bovine kidney cells and mice embryonic stem cells.<sup>4</sup> Citrinin (30 µM) induces reactive oxygen species (ROS) production, mitochondrial membrane potential loss, and apoptosis in HepG2 cells, effects that can be blocked by the antioxidant resveratrol.<sup>3</sup> In contrast, citrinin reduces glutamate-induced excitotoxicity in primary rat cortical neurons at concentrations ranging from 0.1 to 1,000 nM and inhibits LPS-induced production of nitric oxide (NO) in RAW 264.7 cells at 0.625 to 40 µM.<sup>4</sup> It is toxic to brine shrimp larvae (LD<sub>50</sub> = 96 µg/ml), as well as to rats and mice with oral LD<sub>50</sub> values of 50 and 87-105 mg/kg, respectively.<sup>2,4</sup> It induces reproductive abnormalities in male mice and toxic effects in the liver, kidney, heart, and gastrointestinal tracts of various animals.<sup>4</sup> Citrinin has been found in stored cereal grains, as well as beans, fruit, and herbs.

### References

1. Blanc, P.J., Laussac, J.P., Le Bars, P., *et al.* Characterization of monascidin A from *Monascus* as citrinin. *Int. J. Food Microbiol.* **27(2-3)**, 201-213 (1995).
2. Subramani, R., Kumar, R., Prasad, P., *et al.* Cytotoxic and antibacterial substances against multi-drug resistant pathogens from marine sponge symbiont: Citrinin, a secondary metabolite of *Penicillium sp.* *Asian Pac. J. Allergy Immunol.* **3(4)**, 291-296 (2013).
3. Chen, C.-C. and Chan, W.-H. Inhibition of citrinin-induced apoptotic biochemical signaling in human hepatoma G2 cells by resveratrol. *Int. J. Mol. Sci.* **10(8)**, 3338-3357 (2009).
4. Filho, J.W.G.d.O., Islam, M.T., Ali, E.S., *et al.* A comprehensive review on biological properties of citrinin. *Food Chem. Toxicol.* **110**, 130-141 (2017).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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