# PRODUCT INFORMATION

## Theaflavin 3,3'-digallate

*Item No. 25215*

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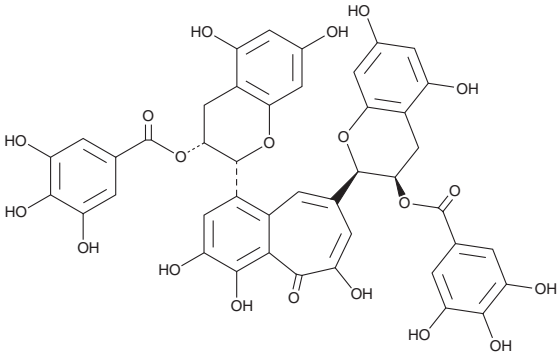
| **CAS Registry No.:** | 30462-35-2 |
| **Formal Name:** | 3,4,5-trihydroxy-benzoic acid, 1,1'-[(3,4,6-trihydroxy-5-oxo-5H-benzocycloheptene-1,8-diyl)*bis*[(2R,3R)-3,4-dihydro-5,7-dihydroxy-2H-1-benzopyran-2,3-diyl]] ester |
| **Synonym:** | $TF_3$, TFDG |
| **MF:** | $C_{43}H_{32}O_{20}$ |
| **FW:** | 868.7 |
| **Purity:** | ≥98% |
| **UV/Vis.:** | $\lambda_{max}$: 278, 377 nm |
| **Supplied as:** | A crystalline solid |
| **Storage:** | -20°C |
| **Stability:** | ≥4 years |
| **Item Origin:** | Plant/Black Tea |



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

### Laboratory Procedures

Theaflavin 3,3'-digallate (TFDG) is supplied as a crystalline solid. A stock solution may be made by dissolving the TFDG in the solvent of choice, which should be purged with an inert gas. TFDG is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of TFDG in DMF is approximately 25 mg/ml and approximately 10 mg/ml in ethanol and DMSO.

TFDG is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, TFDG should first be dissolved in DMF and then diluted with the aqueous buffer of choice. TFDG has a solubility of approximately 0.14 mg/ml in a 1:6 solution of DMF:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

### Description

TFDG is a major polyphenol found in black tea with diverse biological activities.[1-3] It has antioxidant activity, inhibiting the formation of superoxide radicals, singlet oxygen, hydrogen peroxide, and hydroxyl radicals *in vitro* ($IC_{50}$s = 26.7, 0.83, 0.39, and 25.07 µmol/L, respectively).[1] It also reduces hydroxyl radical-induced damage to plasmid DNA. TFDG (12.5-50 µM) prevents LPS-induced release of TNF-α, IL-1β, and IL-6, expression of JNK and p38, and nuclear translocation of NF-κB in RAW 264.7 cells.[2] *In vivo*, TFDG reduces serum levels of TNF-α, IL-1β, and IL-6 and decreases pulmonary edema, pulmonary congestion, and thickening of the alveolar wall in a mouse model of LPS-induced acute lung injury. It also inhibits osteoclast formation, polarization, and osteoclastic bone resorption *in vitro* and reduces titanium particle-induced bone erosion and the number of mature osteoclasts in mice in a dose-dependent manner.[3]

### References


1. Wu, Y.-y., Li, W., Xu, Y., *et al.* Evaluation of the antioxidant effects of four main theaflavin derivatives through chemiluminescence and DNA damage analyses. *J. Zhejiang. Univ. Sci. B.* **12(9)**, 744-751 (2011).
2. Wu, Y., Jin, F., Wang, Y., *et al. In vitro* and *in vivo* anti-inflammatory effects of theaflavin-3,3'-digallate on lipopolysaccharide-induced inflammation. *Eur. J. Pharmacol.* **794(5)**, 52-60 (2017).
3. Hu, X., Ping, Z., Gan, M., *et al.* Theaflavin-3,3'-digallate represses osteoclastogenesis and prevents wear debris-induced osteolysis *via* suppression of ERK pathway. *Acta Biomater.* **48(15)**, 479-488 (2017).





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