BRING THIS TO YOUR DOCTOR · GREY PEPTIDES

# Thionin

**Also called:** gamma-Thionin; Purothionin; Thionins

## What it is

Thionins are small cysteine-rich plant antimicrobial peptides, first isolated from wheat in the 1940s, about 45-48 amino acids with 3-4 disulfide bonds (the gamma-thionin subgroup resembles plant defensins). They bind and disrupt the membranes of fungi and bacteria (PMIDs 38701959, 35924795), and some bind toxic metals, block the VEGF blood-vessel signal and push cancer cells toward death (PMIDs 37218180, 37175071). Thionins are research peptides and plant-engineering tools, not approved medicines, and have never been given to people as an approved treatment.

## Approval status

**Research Chemical.** Not approved drugs: Drugs@FDA and the openFDA label endpoint hold no record, and FDA GSRS and ChEMBL hold no approved-drug record for thionin (searched November 8, 2026). Thionins are plant antimicrobial peptides studied as antifungal, antibacterial, metal-binding and anticancer leads and as plant-engineering tools; there is no registered interventional trial of giving a thionin to people as an approved treatment.

## Dosing, as printed in the page's Recommended Dosing box

**No established human dose**

Thionins are plant research peptides and plant-engineering tools; no thionin is an approved treatment. The work here is in plants, cultured cells and microbes at experimental amounts that do not carry over to people, so no amount is printed here.

Educational information, not medical advice. None is a recommendation for you. An unapproved compound has no established safe or effective human dose, and products sold for "research use only" are not made or tested for people. Talk to a doctor before acting on anything on this site, including before you start, stop or change any medicine or dose.

## Key human evidence

No human study is carded on the page; its 6 study cards are reviews, animal or cell work. The first 2:

• **Transgenic trees making thionins resist fungal infection** (In Vitro, 2024). Thionins expressed in transgenic Paulownia trees bound and disrupted the membranes of attacking fungi, delivered with chitosan nanoparticles, giving the trees enhanced resistance to Fusarium and Aspergillus infections (a plant study). **PMID 38701959**

• **A chile gamma-thionin pushes leukemia cells toward death** (In Vitro, 2023). A gamma-thionin from the habanero chile drove human chronic-myeloid-leukemia cells into a calpain-mediated, caspase-independent form of cell death and altered their epigenetic marks, while sparing normal blood cells (an in-vitro study). **PMID 37175071**

## Interactions

A PubMed search for interaction studies of this compound with any drug (November 8, 2026, 7 records) found none in people. That is not evidence that it is safe to combine with anything.

## Side effects and cautions

| Reported side effects | Contraindications and cautions |
|---|---|
| • No approved-treatment human safety data exist for thionins<br>• Thionins disrupt membranes and some are toxic to cells at active concentrations, which is being explored deliberately against cancer cells (PMID 37175071) — research findings, not approved-drug data<br>• Some thionins bind toxic metals and modulate blood-vessel growth (PMIDs 37218180, 37054894), effects to weigh in any development<br>• Material sold online as 'thionin' is an unregulated research chemical of unverified content | • Not approved medicines: no FDA application or label, and no approval anywhere<br>• No approved human dosing, interaction, pregnancy or long-term safety data exist for thionins<br>• They are plant research antimicrobial peptides and plant-engineering tools, not treatments<br>• Their membrane-disrupting nature warrants particular caution about effects on host cells |

## Five questions to ask

1. Thionin is listed here as "Research Chemical". What does the evidence on this sheet mean for someone in my situation, and is there an approved treatment I should consider instead?
2. Here are the medicines and supplements I take. Do any of them interact with Thionin? This sheet records none published, which does not mean none exist.
3. Which side effects should make me stop and call you, for example no approved-treatment human safety data exist for thionins?
4. Do any of the cautions on this sheet apply to me, such as: Not approved medicines: no FDA application or label, and no approval anywhere?
5. What should we check before I start and while I am on it (blood tests, blood pressure, weight), and how often?

Grey Peptides is a vendor-neutral encyclopedia: it sells nothing and names no seller. This sheet is educational, not medical advice, and is not a prescription.