

# Molecule of the Week

## Hinokitiol

September 4, 2017

### My irony will not escape you. What molecule am I?

The famed Japanese chemist Tetsuo Nozoe first isolated the tropolone monoterpene hinokitiol from the wood of the Taiwanese hinoki tree (*Chamaecyparis taiwanensis*) in 1936. Since then, it has been found in other trees of the Cupressaceae family, although not in the Japanese hinoki.

Beginning in the 2000s, researchers recognized that hinokitiol could be of value as a pharmaceutical, notably for inhibiting the bacterium *Chlamydia trachomatis*. But this year, chemist Martin Burke and colleagues at the University of Illinois at Urbana–Champaign and at several other institutions discovered a more significant medical use for hinokitiol.

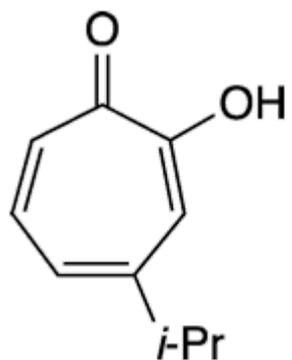
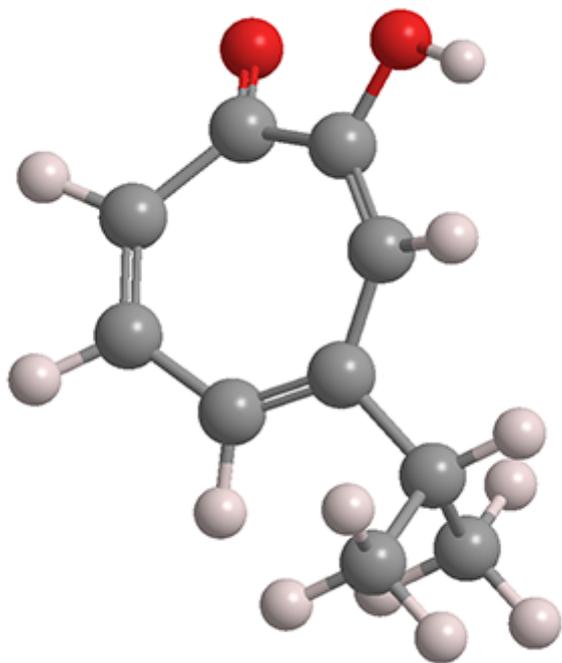
Burke's goal was to overcome irregular iron transport in animals. Insufficiencies of several proteins can lead to iron deficiency in cells (anemia) or the opposite effect, hemochromatosis. Using gene-depleted yeast cultures as surrogates, the researchers screened a library of small biomolecules for signs of iron transport and therefore cell growth. [Hinokitiol popped up as the one that restored cell functionality](#).

Further work by the team established the mechanism by which hinokitiol restore or reduce cell iron. They then switched their study to mammals and found that when rodents that had been engineered to lack "iron proteins" were fed hinokitiol, they regained iron uptake in the gut. In a similar study on zebrafish, the molecule restored hemoglobin production.

A commentary on the work of Burke et al. nicknamed hinokitiol the "[Iron Man molecule](#)". This is fitting (and ironic) because discoverer Nozoe's first name can translate into English as "iron man".



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## Hinokitiol Fast Facts

CAS Reg. No.

499-44-5

Molar mass

164.20 g/mol

Formula

C<sub>10</sub>H<sub>12</sub>O<sub>2</sub>

Appearance  
Melting point  
Water solubility

Colorless to pale yellow crystals  
52.0–52.5 °C  
1.2 g/L

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