

Understanding a natural cloaking mechanism

May 19 2016, by Jim Shelton



Researchers at Yale and in Europe are exploring a natural "cloaking" mechanism that allows certain elastic materials—think Jell-O, for instance—to imbibe substantial amounts of liquid droplets without changing their own mechanical properties. Writing in the May 18 online edition of the *Proceedings of the Royal Society A*, John Wettlaufer and his colleagues expanded on previous work about surface tension to find the limits of such natural cloaking.

"Our theory says you can put in a variety of inclusions and get softening, stiffening, or nothing, in terms of the mechanical response," said

Wettlaufer, Yale's A.M. Bateman Professor of Geophysics, Mathematics, and Physics.

"There is a mechanical cloaking, in which the properties of a material do not change no matter how many droplets you put in. Jell-O is just a fun example, but the human body is filled with just this sort of effective medium, so our theory provides a rigorous framework to look at the mechanical aspects of physiological response."

More information: Francesco Mancarella et al. Surface tension and the Mori–Tanaka theory of non-dilute soft composite solids, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Science* (2016). [DOI: 10.1098/rspa.2015.0853](https://doi.org/10.1098/rspa.2015.0853)

Provided by Yale University

Citation: Understanding a natural cloaking mechanism (2016, May 19) retrieved 25 April 2024 from <https://phys.org/news/2016-05-natural-cloaking-mechanism.html>

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