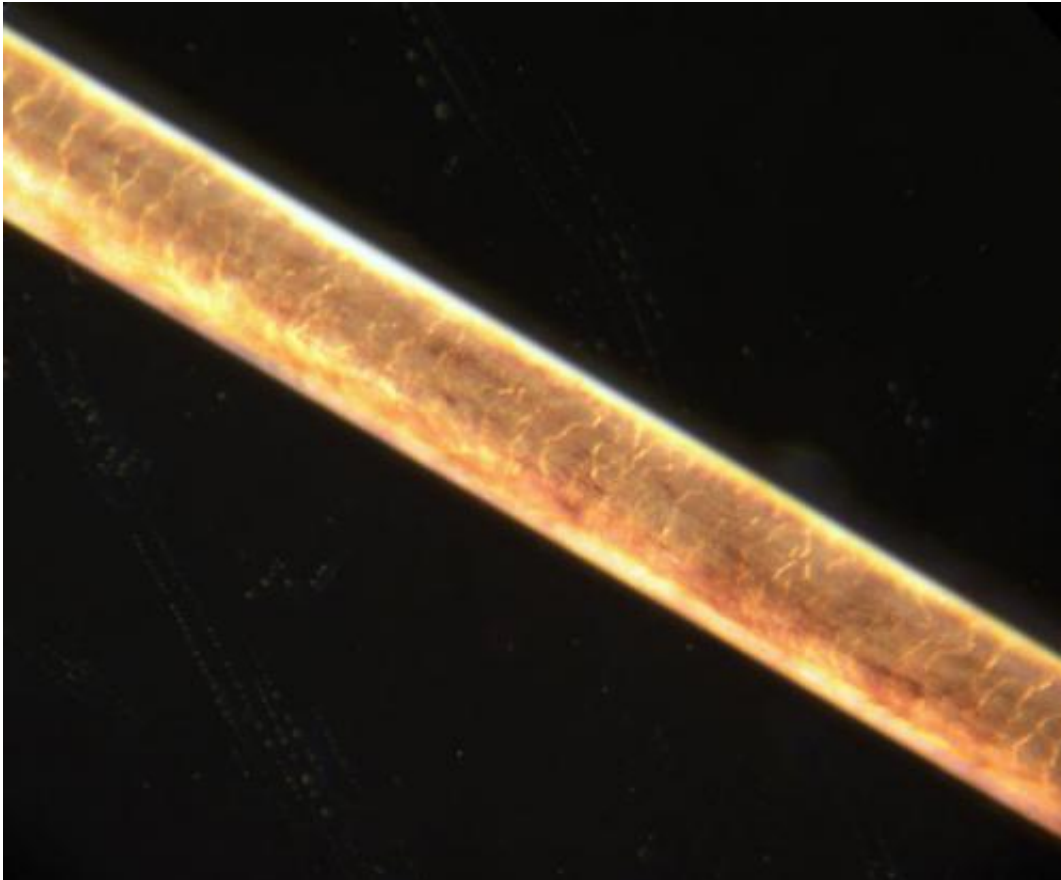


A novel composite for tensile strength

September 27 2019, by David Bradley



Strand of human hair at 200x magnification. Credit: Jan Homann/Wikipedia

Materials scientists are always on the look out for new composites, materials comprising two or more different substances that combine to bring together the useful properties of each component and to overcome the limitations of any. Moreover, some composites might also work synergistically so that the useful properties of one component enhance

those of the other and vice versa. Often, computation and modeling can be used to work out the likely outcomes of combining certain components.

New research published in the *International Journal of Computational Materials Science and Surface Engineering* reveals a [mathematical model](#) that can be used to optimize a novel composite for tensile strength. The composite is made from the synthetic polymer, polyester, and [human hair](#) as a reinforcing component.

Divakara Rao and Udaya Kiran of the J.B. Institute of Engineering and Technology, in Hyderabad, and Eshwara Prasad of the Jawaharlal Nehru Technological University also in Hyderabad, prepared polymer-based composites using chopped fibers of human hair at between 5 and 25 percent by weight and with fiber lengths of 10 to 50 millimeters. Data from [tensile strength](#) testing of these experimental composites were used to build a model that might then be used to optimize the formulation of new composites.

Given the need for novel composites with new properties and a need to reduce our reliance on petrochemicals and invoke the use of renewable materials, brushing up on hair science in this context makes complete sense. There are, of course, many other natural fibers that might also be incorporated into semi-synthetic composites for a wide range of materials science and engineering applications.

More information: P. Divakara Rao et al. Mathematical model and optimisation for tensile strength of human hair reinforced polyester composites, *International Journal of Computational Materials Science and Surface Engineering* (2019). [DOI: 10.1504/IJCMSSE.2019.101658](https://doi.org/10.1504/IJCMSSE.2019.101658)

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Citation: A novel composite for tensile strength (2019, September 27) retrieved 20 March 2024 from <https://phys.org/news/2019-09-composite-tensile-strength.html>

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