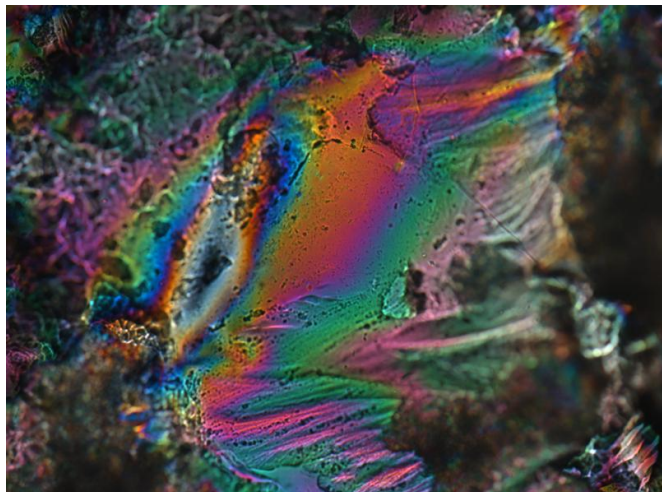


Polymer puts new medical solutions within reach

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The liquid crystalline hydrogel in a dry state. Credit: Patrick Mather

Researchers, particularly those in the medical field, have been searching for a way to combine the properties of liquid crystallinity with those of hydrogels.

Liquid crystals are characterized as having the fluidity of liquid but some of the order of a crystal so they can be oriented to have structure. They are not water-loving, in that they will dissolve in water, making them less than ideal candidates for use inside the body.

Hydrogels, however, are water-loving but they lack the order to orient them into specific shapes.

Combining the properties of liquid crystals and [hydrogels](#) in just the right proportions creates the potential for new materials that have the same mechanical properties as [soft tissues](#) in the body. A material that is water-loving and has structure opens up the door the possibility for [artificial blood vessels](#) that are mechanically stealth so they

wouldn't be viewed as a foreign body.

Professor Pat Mather has developed a process that can create this type of a polymer.

The paper "A hydrogel-forming liquid crystalline elastomer exhibiting soft shape memory" authored by Mather and graduate student Amir Torbati G'14, now a post-doc at UC Denver, was featured on the cover the *Journal of Polymer Science B: Polymer Physics*.

"It is a balancing act of not having too many water-loving groups in the polymer and balancing that with other chemicals in the polymer that promote structure." said Mather.

Whatever the hydrogels do to make the liquid crystals water-loving destroys the order of crystallinity, so historically creating a material like this has been a challenge but Mather's process opens to the door to new medical applications that were previously out of reach.

More information: To see the full article visit: onlinelibrary.wiley.com/doi/10.1002/polb.v54.1/issuetoc

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