

# Shellfish and inkjet printers may hold key to faster healing from surgeries

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Using the natural glue that marine mussels use to stick to rocks, and a variation on the inkjet printer, a team of researchers led by North Carolina State University has devised a new way of making medical adhesives that could replace traditional sutures and result in less scarring, faster recovery times and increased precision for exacting operations such as eye surgery.

Traditionally, there have been two ways to join tissue together in the wake of a [surgery](#): sutures and [synthetic adhesives](#). Sutures work well, but require enormous skill and longer operating times. Additionally, the use of sutures is associated with a number of surgical complications, including discomfort, infection and inflammation. Synthetic adhesives are also widely used, but they are the source of increasing concerns over their toxicological and environmental effects. One such concern with some synthetic medical adhesives is that - because they are not biodegradable - they do not break down in the body and therefore may cause inflammation, [tissue damage](#), or other problems.

But new research shows that adhesive proteins found in the "glue" produced by [marine mussels](#) may be used in place of the synthetic adhesives without these concerns, because they are non-toxic and biodegradable, according to study co-author Dr. Roger Narayan. In addition, the mussel proteins can be placed in solution and applied using inkjet technology to create customized medical adhesives, which may have a host of applications. For example, Narayan says this technique may "significantly improve wound repair in eye surgery, wound closure

and fracture fixation." Narayan is an associate professor in the joint [biomedical engineering](#) department of NC State and the University of North Carolina at Chapel Hill.

"This is an improved way of joining tissues," Narayan says, "because the use of the inkjet technology gives you greater control over the placement of the adhesive. This helps ensure that the tissues are joined together in just the right spot, forming a better bond that leads to improved healing and less scarring." This increased control would be a boon for surgery that relies on extreme precision, such as eye repair, Narayan explains.

More information: *The Journal of Biomedical Materials Research B* will publish the study, "Inkjet printing of adhesives," in April.

Source: North Carolina State University

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