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Structuring soft materials to inhibit scarring

The translation of medical technologies into the clinic can be hindered by an onerous regulatory framework. Demonstrating the safety of novel materials compositions can represent a major cost that ultimately prevents medical companies from investing in product development. We are developing new methods that allow for the structuring of already approved materials compositions so that they exhibit physical properties that are suitable in a range of different applications. By taking this approach, we hope that we will derisk the development of medical technologies for early investment, allowing them to be taken to the point of clinical trial. In this talk, I will discuss how we have used shear processing to develop a material that is shear thinning, but rapidly thickens when applied to a surface. This material has demonstrated utility as an eyedrop to prevent scarring following microbial keratitis and has also been used as a support matrix in the bioprinting of complex tissues.