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Hong Kong develops novel injectable hydrogel to revolutionise regenerative medicine

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Fibro-Gel regenerates tissues significantly faster, with new tissue forming sooner



Researchers from the University of Hong Kong (HKU), the HKU-Shenzhen Hospital and the Princeton University, have collaborated to achieve a breakthrough in the development of injectable hydrogels, a highly effective method of administering medicine. Their innovative product, Fibro-Gel, offers numerous advantages over existing hydrogels and has promising applications in wound healing.

Injectable hydrogel delivery is a highly effective method of administering medicine. A drug is incorporated into a soft gel which is then injected directly where it is required. Another advantage of this method is that the gel releases the drug gradually, allowing for better, more precise control of drug dosage.

However, there have been challenges in hydrogel development, such as the high cost of production, difficulty in scaling up, and the potential for adverse reactions in patients.

The Fibro-Gel, which is addressing these issues, is made by squeezing out a polymer, that contains the molecules of the required drug, through a narrow channel (not unlike toothpaste squeezed out of a tube), and snapping off the microfibres by using a pulse of ultra-violet light.

What sets aside Fibro-Gel from the existing hydrogels is that it is solely aqueous-based, without using oils – which makes it more biocompatible, stable and cheaper to make. In addition, Fibro-Gel is biomimetic – it replicates the properties of biological materials, such as the tissues it is injected into, which prevents adverse reactions. As the result, Fibro-Gel heals wounds faster as it promotes vascularisation – formation of new blood vessels, which plays a crucial role in wound healing.

It allows the use of different drugs within the same gel, thus enabling controlling and tuning the time of their release. Also, the production of Fibro-Gel production is not costly and can be easily scaled up to manufacturing levels. One potential application of Fibro-Gel is regeneration of brain tissue in people suffering from Parkinson's or Alzheimer's.