

NEWS | APRIL 11 2024

## Honey-based 3D printed bio-tape encourages wound healing

FREE

Maura Shapiro



Scilight 2024, 151105 (2024)

<https://doi.org/10.1063/10.0025394>

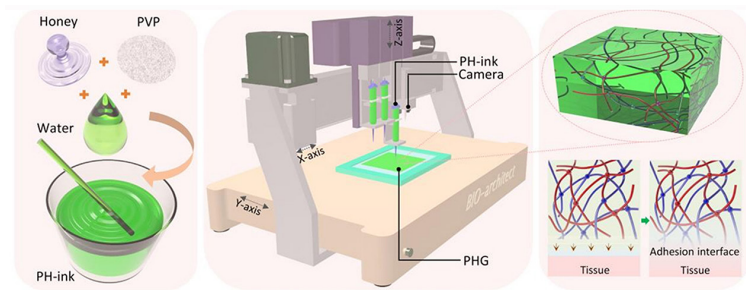


11 March 2024

## Honey-based 3D printed bio-tape encourages wound healing

Maura Shapiro

**Bandage made from a honey gel is flexible, adhesive, and easy to remove, promoting wound healing and reducing infection risk.**



More than just a delicious flavoring, honey has antibacterial, anti-inflammatory, and antioxidant properties that, when applied directly to a wound, can promote healing. Its naturally high sugar content encourages fluid movement and feeds cell proliferation, facilitating expedited healing.

For centuries, honey has been used for this purpose, commonly spread on the wound bed and covered with gauze. But the honey drains quickly, causing discomfort and requiring frequent reapplication. Hu et al. developed a 3D-printed tape comprised of a honey-based gel (PHG) and a water-soluble polymer, polyvinylpyrrolidone (PVP), that adheres to the injury and can be easily removed.

PVP serves as the film-forming base of the 3D printing ink due to its ability to adhere and coagulate. But at low humidity, it becomes glassy and fracture prone. Fortunately, in addition to its other benefits, honey is moisturizing and preserves PVP's flexibility and toughness for use as bio-tape.

The tape is 3D-printed to suit the needs of each wound. The team achieved precision up to 100 micrometers and tested the bio-tape in situ.

"Before sealing with the PHG bio-tape, the wound was sterilized with medicinal alcohol," said author Guangyong Li. "First, an instant bond was formed by the PHG bio-tape and the water adsorbed by the alcohol. Then the polymer chains quickly entangled, and cross-linked with the tissue surface, to achieve topological adhesion. The topological adhesion could ensure that the blood had difficulty overflowing without affecting normal human activity."

The bio-tape could be easily removed by peeling it off, like a regular adhesive bandage, or by dissolving it in alcohol. The authors hope its versatility and flexibility will lead to its wide use for expedited wound healing.

**Source:** "3D printed polyvinylpyrrolidone-honey-gel with adhesive and degradable ability applied for bio-tape," by Shilong Hu, Yan Liu, Zhengzhou Yin, Husheng Chen, Yuan Jin, Aibing Zhang, Minghua Zhang, Licheng Hua, Jianke Du, and Guangyong Li, *APL Materials* (2024). The article can be accessed at <https://doi.org/10.1063/5.0196086>.

Published by AIP Publishing (<https://publishing.aip.org/authors/rights-and-permissions>).