

Seaweed molecules found to aid wound healing

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Venus Shell Systems Founder and Director Dr Pia Winberg with ACES Director Professor Gordon Wallace. Credit: UOW

Scientists from the ARC Centre of Excellence for Electromaterial Science (ACES) and University of Wollongong (UOW), in partnership with their seaweed bioinks collaborators Venus Shell Systems, have discovered that a molecular species known as ulvan aids wound healing in humans.

Their [research paper](#) is the cover story on the latest issue of *Biomaterials Science*. Titled "3D bioprinting dermal-like structures using species-specific ulvan," the new findings outline how ulvan contained in green seaweed can play a key role in wound [healing](#) with its structure resembling the biomolecules found in humans.

The team behind the paper from ACES and UOW includes ACES Director Professor Gordon Wallace and researchers Associate Professor Stephen Beirne, Dr. Zhilian Yue and Xifang Chen, in collaboration with Venus Shell System's Dr. Pia Winberg and stem cell biologist Professor Yan-Ru Lou from Fundan University.

"Wound healing occurs in a 3D environment involving a number of cell types and biomolecules, so the use of 3D bioprinting to create scaffolds for wound healing has attracted much attention," Professor Wallace said.

"Here we have formulated a bioink for 3D bioprinting, containing ulvan and discovered that the presence of it assists in the proliferation of cells involved in wound healing."

The team's findings also showed that ulvan regulates the function of cells in producing key biomolecules used during wound healing, a positive step forward for the research.

"Ulvan acts as molecular reinforcement in 3D printed scaffolds, a key feature in preventing structure contraction, and hence minimizes scarring during [wound healing](#)," Professor Wallace said.

ACES researchers have been collaborating with Dr. Winberg and Venus Shell Systems for a number of years now, going from strength to strength to continue to meet clinical challenges.

"It has been so exciting to begin the journey of unlocking molecules

from seaweed and delivering them to new heights in partnership with researchers in biomaterials," said Dr. Winberg.

"Particularly when the molecules that we have found from a unique species of Australian green seaweed are uncannily similar in structure and function to the molecules that exists in human skin.

"It will be exciting when this translates into improving the health outcomes for patients with [wounds](#)."

More information: Xifang Chen et al. 3D bioprinting dermal-like structures using species-specific ulvan, *Biomaterials Science* (2021). [DOI: 10.1039/D0BM01784A](https://doi.org/10.1039/D0BM01784A)

Provided by University of Wollongong

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