Hydrogels with Tunable Stability

VTIP 20-120: "New Class of Biosourced Hydrogels Precursor for Controlled Delivery and Extracellular Matrix Mimics"

THE CHALLENGE

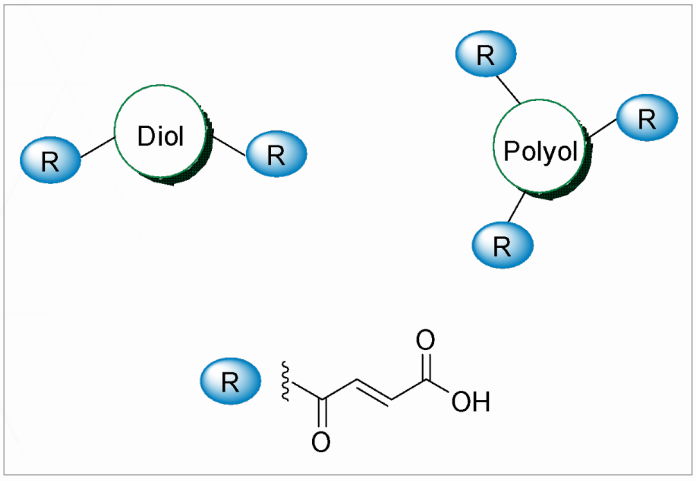
Most hydrogels used for biomedical applications today have drawbacks in their stability, lack of heat resistance, and the use of UV light as an initiator, which may kill cells trapped inside. An improvement in extracellular matrix hydrogels is needed to improve the growth and safety of cells.

OUR SOLUTION

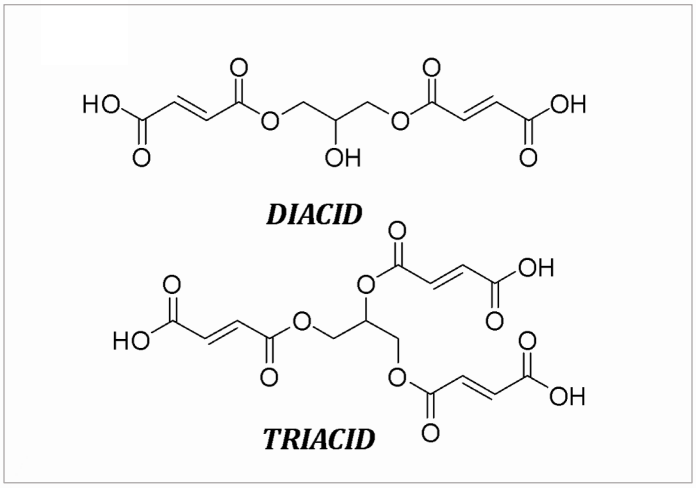
Researchers at Virginia Tech have developed a new unsaturated monomeric diacid and triacid derivative used as precursors in thiol-Michael addition hydrogels. These precursors have a simple and solvent-free crosslinking process. The precursors have multiple advantages over the current resulting hydrogels.

Benefits include:

- Tunable stiffness
- Heat stable at 37°C
- Remains solid for 30 days
- Superabsorbent ability and tunable release rates



Unsaturated monomeric units were synthesized from diol, polypl, and diacid derivatives.



Chemical structure of diacid and triacid derivatives.

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