

New Hydrogel with Strength and Self-Healing Ability Mimics Human Skin

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Researchers from Aalto University in Finland and the University of Bayreuth in Germany have created an innovative hydrogel mimicking the unique characteristics of human skin in a pioneering study. Not only strong and flexible, this new material can also self-heal - a mix that eluded scientists until now.

The team's innovation lies in incorporating ultra-large, ultra-thin clay nanosheets into the hydrogel, which forms a densely entangled polymer network between the layers. This well-organized structure greatly improves the material's strength and capacity for mending.

The application process involves mixing monomer powder with a nanosheet solution and curing the blend under UV light. Once cured, the polymer chains-resembling microscopic yarn - twist and tangle in a random pattern, allowing the material to self-repair when cut. Typically, complete healing occurs within 24 hours, though up to 90% recovery can be achieved in as little as four hours.

Dr. Hang Zhang of Aalto University stated, "This discovery has the potential to redefine material design." With potential applications in wound healing, drug delivery, soft robotics, and artificial skin, its impact could be far-reaching. Inspired by nature and engineered with nanoscale precision, this hydrogel represents a significant advancement toward materials that can adapt, endure, and heal much like human skin.

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